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Corporate Environmental Affairs

SHENANDOAH ROAD GROUNDWATER CONTAMINATION SUPERFUND SITE

ALTERNATE WATER SUPPLY EVALUATION

FINAL REPORT

Prepared for:

IBM Corporation
Corporate Environmental Affairs
Somers, New York

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EXECUTIVE SUMMARY

This report presents the results of a technical and regulatory evaluation of various alternatives to provide the source of an alternate water supply to affected or threatened properties at the Shenandoah Road Groundwater Contamination Superfund Site (Site). This evaluation addresses various source alternatives as well as transmission piping routes associated with each. It also defines the response scope in terms of the service area and water supply needs of this Site.

The response scope has been defined as including 154 properties in the Shenandoah area which comprise the Shenandoah Service Territory (SST). The estimated supply needs have been calculated to be 80,000 gallons per day (gpd) daily average and 132,000 gpd maximum daily demand.

The evaluation began with six potential water supply sources that had been identified in the Alternate Water Supply Response Action (AWSRA) Work Plan, dated December 13, 2001. The six potential sources were:

* Town of Fishkill Municipal Water Supply
* Town and City of Poughkeepsie Hudson River intake/Dutchess County Water and Wastewater Authority Pipeline
* Locally-developed groundwater supply
* Four Seasons Private Water Supply Company
* Delaware Aqueduct
* IBM East Fishkill private water supply

As part of this evaluation, three of these original potential sources were eliminated prior to the detailed and comparative analysis of alternatives. These include:

1) the Four Seasons Private Water Supply which was eliminated due to inadequate supply,
2) the Delaware Aqueduct which was eliminated due to denial by New York City Department of Environmental Protection of IBM's request for access to this supply, and

3) the IBM East Fishkill private water supply which was eliminated due to inadequate supplies.

This left three potential sources to be fully evaluated in the current report as follows:

* the Town of Fishkill
* the Dutchess County Pipeline, and
* Locally-developed groundwater

In performing this evaluation, the Town of Fishkill has been designated Alternative 1, and the Dutchess County Pipeline has been designated Alternative 2. The locally-developed groundwater supply was subsequently divided into two separate alternatives, both associated with the "Route 376 Properties" described in this report. Each of these two alternatives corresponds to the use of one of two parcels along Route 376 for the development of groundwater supplies. Alternative 3 is Parcel A (the southernmost parcel); Alternative 4 is Parcel B (the northernmost parcel).

All four alternatives that were evaluated in the detailed and comparative analysis of alternatives have been determined to be feasible and can be implemented to provide the alternate water supply to the Site. All four alternatives have been evaluated using ten criteria, nine of which are the standard EPA Superfund criteria and the tenth is "Administrative Feasibility" which relates to the status of agreements by which rights to develop each source have been secured.

Overall Protection of Human Health and the Environment: All four alternatives will provide equivalent overall protection of human health and the environment because all four alternatives are capable of providing an alternate water supply to the Site which will meet state and federal requirements for drinking water quality and quantity.

Compliance with ARARs: All four alternatives will fully comply with applicable or relevant and appropriate requirements (ARARs) as they relate to drinking water supplies and related systems and their construction.

Long-Term Effectiveness: All four alternatives will be effective in providing a long-term source of potable water. Because of differences in natural water quality, there is some variation among the alternatives in terms of the level of effort that will be necessary to produce and maintain that effectiveness.

Reduction of Toxicity, Mobility and Volume: All four alternatives are equivalent in terms of this criterion because all of them provide a clean potable supply of water to the Site and eliminate the need for the short-term solution currently in place, i.e., the highly-effective point-of-entry treatment systems (POETs).

Short-Term Effectiveness: The time to completion of design and construction following a decision for these alternatives ranges from twenty-four months to twenty-eight months. While this represents some difference in their ranking under this criterion, the difference of four months between the best and worst case alternatives does not represent a significant basis for differentiation of the alternatives. To the extent, however, that Alternative 1 involves the construction of the longest transmission piping including a substantial distance along Route 52, the short-term risk to workers and the community would be greatest for this alternative. For Alternatives 3 and 4, wetlands permitting and floodplain issues must also be addressed.

Constructability: All four alternatives are highly constructable using standard construction methods for all elements of the supply system.

Reliability: Alternatives 1 and 2 are deemed to be highly reliable due to the ownership of the source by municipalities which have a long track record in providing potable water supply to their residents. Alternatives 3 and 4 are also deemed reliable due to the anticipated ownership of either of these alternatives by a municipality which also has experience in supplying potable water to several residential developments.

Expandability: All four alternatives are expandable to the extent conceivably necessary to supply users along the transmission piping route from the source to the Site or an expansion of the water district

associated with the Site. Alternative 2 would afford the greatest degree of expandability due to the substantial excess capacity available from this source.

Administrative Feasibility: Alternatives 3 and 4 are subject to an option agreement between IBM and the property owner that would permit IBM to implement either of these alternatives with no further agreements required. Alternative 1 requires a three-party agreement among the Town of Fishkill, the Town of East Fishkill and the IBM Corporation. Letters of intent have been received from the two Towns accepting in principle the terms of the three-party agreement and the drafting of that agreement is nearly completed. It should be finalized soon after the submission of this report revision. Alternative 2 is subject to a Memorandum of Understanding dated May 6, 2002, which includes the IBM Corporation, the Dutchess County Water and Wastewater Authority and the City and Town of Poughkeepsie. Negotiations are currently proceeding toward a final agreement. Detailed plans and specifications for this alternative have been prepared and submitted to appropriate agencies for review and approval.

Cost: The typical present worth cost evaluation timeframe under Superfund is thirty years. Total present worth including capital cost and this thirty years of operation and maintenance (O&M) expense has been projected to range from 8.3 million dollars (Alternative 2) to 9.95 million dollars (Alternative 1). Alternatives 3 and 4 have been estimated at a present worth of 9.76 million dollars and 9.93 million dollars respectively. Ongoing O&M costs range from a low of $5.70 per 1000 gallons (Alternative 1) to a high of $6.80 per 1000 gallons (Alternative 3). Alternative 2 O&M costs are estimated to be $5.90 per 1000 gallons and Alternative 4 O&M costs are estimated to be $6.30 per 1000 gallons. The total annual O&M cost ranges from a low of $68,685 (Alternative 1) to a high of $82,000 (Alternative 3). Comparative tables of cost for the various alternatives are presented in Section 6.

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1 INTRODUCTION

This report, entitled "Shenandoah Road Groundwater Contamination Superfund Site, Alternate Water Supply Evaluation" has been prepared in accordance with the Alternate Water Supply Response Action (AWSRA)Work Plan (WP) dated December 13, 2001. The AWSRA is being performed pursuant to Paragraph 41(f) of the Administrative Order on Consent for Removal Action, Index Number CERCLA-02-2001 (AOC), entered into by IBM Corporation (IBM) and the United States Environmental Protection Agency (EPA) on May 16, 2001 to facilitate IBM's voluntary involvement in continuing response actions at the Shenandoah Road Groundwater Contamination Superfund Site (Site). This report has been prepared for IBM by Groundwater Sciences Corporation (GSC) and Brinnier and Larios, LLP (B&L) with assistance from Lawler, Matusky and Skelly Engineers LLP relative to wetlands and flood plain permitting. It is being submitted to EPA to facilitate the Agency's review of the alternatives that have been evaluated in accordance with the AWSRA WP.

1.1 Background Information

Since June 2, 2000, EPA has been conducting removal activities at the Site in response to the detection of tetrachloroethene (PCE) and trichloroethene (TCE) in private residential drinking water wells in the area known as "Shenandoah" in the town of East Fishkill, Dutchess County, New York (shown on Figure 1-1). Figure 1-1 shows a line that circumscribes the locations of all residential wells and IBM-installed monitoring wells at which Site constituents have been detected. In addition to providing Point of Entry Treatment (POET) systems on the affected wells, EPA also began a sampling program to monitor water quality in both the affected wells and others that EPA believed could potentially become affected by contaminant plume migration. Since June 6, 2001, IBM has been responsible for the installation of new POET systems that IBM decided to install, and the operation and maintenance of these new systems and pre-existing EPA systems. In all, there are currently 102 POET systems installed and in operation and an additional 45 residences at which quarterly or semiannual sampling of well water is performed. The installation of these POET systems has been completed as a time-critical response action, not a permanent remedy.

1.2 Study Area Description

The overall response plan for supply wells that have been impacted or threatened by Site-related contamination includes the installation of a permanent alternate water supply to replace the use of individual domestic wells. In arriving at the six potential water supply sources identified in the AWSRA WP, a preliminary assessment identified three existing or planned water supply sources within the Town of East Fishkill that might be capable of supplying the needs of the Site alternate supply. As shown on Plate 1, these are: 1.) the existing supply of the Four Seasons Water Corporation; 2.) the planned Dutchess County Pipeline; and 3.) the IBM East Fishkill water supply system.

In addition to these existing or planned sources within the Town of East Fishkill, consideration was given to other regional sources (i.e., beyond the southern East Fishkill area) to determine their potential to serve the needs of the Site. Two such potential sources were identified. These are the existing Town of Fishkill water system and the Delaware Aqueduct owned by New York City with access controlled by the New York City Department of Environmental Protection (NYCDEP). This access shaft to the aqueduct is located north of the hamlet of Chelsea on the Hudson River (Plate 1).

Finally, the AWSRA WP identified the potential to independently develop a groundwater source to supply the needs of the Site. Based on a review of the geology and hydrogeology of the southern East Fishkill area and a preliminary review of existing well fields in the area, there are two principal aquifers that could readily supply the needs of the Site. These are carbonate bedrock units that underlie much of the area north of the Hudson Highlands and the glacial outwash units of various depositional environments that occur in isolated stream valleys and as a discontinuous veneer over bedrock in much of the same area. The IBM East Fishkill plant uses both of these aquifers and the Four Seasons Water Corporation uses the carbonate bedrock aquifer. Both are present within the Site area and in the areas surrounding the Site to the west, north and east. This option is represented on Plate 1 by an area within a three-mile radius of the Site.

Based on the forgoing considerations, a preliminary list of potential water supply sources to provide alternate water supply at the Site was completed in the preparation of the AWSRA WP. This list includes the following alternatives, which are shown on Plate 1:

* Town of Fishkill Municipal Water Supply
* Town and City of Poughkeepsie Hudson River Intake/Dutchess County Water and Wastewater Authority Pipeline
* Locally-Developed Groundwater Supply
* Four Seasons Private Water Supply
* Delaware Aqueduct
* IBM East Fishkill Private Water Supply

These alternatives and the associated area shown on Plate 1 constitute the study area for the AWSRA evaluation. The locally-developed groundwater supply alternative is represented on this plate by a pair of contiguous parcels located along Route 376 north of Route 52 and labeled "Route 376 Properties". While the characterization of these two parcels is described as though they were one combined alternative, they are in fact evaluated as two separate and distinct alternatives. The four alternatives fully evaluated in this report are as follows:

Alternative 1: Town of Fishkill Municipal Water Supply

Alternative 2: Town and City of Poughkeepsie Hudson River Intake/Dutchess County Pipeline

Alternative 3: Route 376 Properties, Parcel A

Alternative 4: Route 376 Properties, Parcel B

1.3 Preliminary Screening of Alternatives

Prior to the collection and evaluation of detailed information relative to any of the options listed in Section 1, a preliminary evaluation was performed to determine the feasibility of acquiring the necessary supply from each potential source. In the case of three of the alternatives, the Delaware

Aqueduct, the IBM Plant Site, and the Four Seasons Water Company, this preliminary screening has eliminated them from consideration. The following three subsections describe the basis for these screening decisions.

1.3.1 Delaware Aqueduct

The Delaware Aqueduct was constructed by the City of New York from 1937-1944, and has a capacity of approximately 1 billion gallons per day. It was designed to convey water from the Delaware River watershed (Rondout Reservoir in Western Ulster County) to the Hill View Reservoir at the city line in Yonkers, New York. This portion of the tunnel is 85 miles long and is a deep-rock pressure tunnel. The section between the Rondout Reservoir (Ulster County) and the Croton Reservoir (Putnam County) is 13.5 feet in diameter and 45 miles long.

The tunnel is fed by several reservoirs, including the Rondout Reservoir, Neversink Reservoir, Pepacton Reservoir and Cannonsville Reservoir. The Rondout Reservoir acts as the key to the Delaware Aqueduct tunnel, as it receives all the water from the other reservoirs and acts as a control chamber for the system.

The Delaware Aqueduct passes through southern Dutchess County. It crosses the Hudson River at Chelsea in Dutchess County, at which point it is 600 feet below sea level. Shaft 6 is located east of the Hudson River and has connections for supplying neighboring communities and pumps for emptying the tunnel when required. This shaft at Chelsea is the potential connection point to serve this project.

The subject water supply is currently an unfiltered surface water supply and New York City has a filtration avoidance waiver from the US Environmental Protection Agency. Initially, this water supply would require only disinfection and corrosion control. However, filtration of this source may be required in the future.

Access to the aqueduct for water supply is controlled by the New York City Department of Environmental Protection (NYCDEP). Based on EPA's preliminary contacts with the NYCDEP in 2001 and research into the history of statutes and regulations relating to access to the water transmitted

in the NYC water system aqueducts, several issues were identified in the AWSRA WP that were anticipated to render this alternative impracticable. These are:

1. A 1905 statute passed by the New York State legislature prevents access to the aqueduct for water supply in any county which did not agree to accept the construction of a water supply reservoir within its boundaries. Since Dutchess County did not agree to the construction of a reservoir, there is no automatic right of access guaranteed to the county or its municipalities.

2. Although there are two access shafts in Dutchess County, NYCDEP has stated it would only permit access at the shaft located north of Chelsea on the Hudson River and not at the shaft located near the intersection of Route 9 and I-84 in the Town of Fishkill. This substantially increases the transmission distance.

3. NYCDEP indicated that a water supply system accessing the aqueduct would be subject to interruption during droughts. Therefore, the system must have a backup supply to service the systems needs during such interruptions. If this were the case, another of the alternatives listed above would have to be constructed even if the access to the aqueduct were permitted.

Written inquiries were made by IBM to the NYCDEP to determine the eligibility of this project to draw water from the aqueduct. NYCDEP responded to these inquiries in a letter dated January 3, 2002 (sic, actually 2003) to IBM's project coordinator from the NYCDEP Deputy Commissioner in the Bureau of Water Supply. In this letter, NYCDEP stated the following:

> "The Water Supply Act of 1905 (New York City Administrative Code (Section) 24-360) governs all connections to the New York City water supply system. Under the Act, municipalities or water districts in counties that contain a portion if (sic) the New York City water supply are entitled to take water from the City water supply system. However, the Water Supply Act specifically excludes communities in Dutchess County. Accordingly, DEP has historically never approved any request from a municipality or water district in Dutchess County to connect to the City system. In order to preserve the ability of the water supply to meet the future demands in the City and other communities that are entitled to take water, I must respectfully deny your request for a connection to the Delaware Aqueduct."

Based on this response from the NYCDEP and the other restrictions noted above, the Delaware

Aqueduct has been eliminated from further consideration as an alternate water supply source for the Shenandoah Site.

1.3.2 IBM East Fishkill Plant Site Supply

The IBM East Fishkill Plant Site Supply (IBM EF) is comprised of three well fields. These are: 1.) The Main Plant Well Field, 2.) The Railroad Spur Well Field, and 3.) The Wiccopee Well Field. The Main Plant Well Field is located on the eastern portion of the IBM East Fishkill Plant Site. There are eleven wells with a combined nominal yield of 1.2 million gallons per day (MGD). The Railroad Spur Well Field is located along the inactive railroad spur north of the plant site. There are two wells in this well field, with a combined nominal yield of 2.0 MGD. The third well field is located north of the Hamlet of Wiccopee. It is comprised of eight production wells with a combined nominal yield of 3.0 MGD.

Based on an interview with IBM's water supply engineer for the plant site, water usage at the plant averages 5.7 MGD. In order to support these current needs, the plant combines an average withdrawal of 4.4 MGD from the three well fields with recycle and reuse systems in order to supply an additional 1.3 MGD (average). Given the need to recycle and reuse this large volume of water to supply current needs and the projected expansion of those needs, the plant site has indicated that no excess capacity is available to supply the needs of the Shenandoah Site's alternate water supply project. For this reason, no further evaluation of this alternate has been performed.

1.3.3 Four Seasons Water Company

An analysis of the capacity of this system in the absence of any plans to augment the current groundwater sources, led to the conclusion that this option was not feasible because it does not offer sufficient capacity to serve the needs of its current and currently planned customers together with the Shenandoah Service Territory (SST). In this regard, the company currently owns three wells with capacities of 45 gpm, 49 gpm and 50 gpm. The following analysis demonstrates why there is a shortfall in capacity.

Regulatory requirements for water supply for the system are found in Chapter 1 NY State Sanitary Code, Part 5-Drinking Water Supplies, Subpart5-1-Public Water Systems, promulgated 2001, which further reference Recommended Standards for Water Works, GLUMBR, 1997, and are summarized as follows:

Source Capacity (reference: Recommended Standards for Water Works, GLUMBR, 1992, 3.2 Groundwater, 3.2.1.1 Source Capacity and 3.2.1.2 Number of Sources)

Source Capacity

"The total developed groundwater source capacity shall equal or exceed the design maximum day demand and equal or exceed the design average day demand with the largest producing well out of service."

Number of Sources

"A minimum of two sources of groundwater shall be provided"

Water Supply Capacity on Average Daily Demand Basis

49 gpm + 45 gpm = 94 gpm = 135,360 gallons per day

Water Supply committed to Existing Franchise Area = 67,005 gallons per day

Balance of Capacity = 68,355 gallons per day

Water supply Requirement for Shenandoah = 80,000 gallons per day

Water Supply Deficit = (11,645) gallons per day

Water Supply Capacity on Maximum Daily Demand Basis

49 gpm + 45 gpm +50 gpm =144 gpm = 207,360 gallons per day*

Maximum Daily Demand committed to Existing Franchise Area = 110,558 gallons per day (based on 1.65 factor for maximum daily demand)

Balance of Capacity = 96,802 gallons per day

Water supply Requirement for Shenandoah (max daily demand) = 132,000 gallons per day

Water Supply Deficit = (35,198) gallons per day

* See Section 3.1.2 for calculation of average and peak demand.

Based on this analysis of water supply deficits that would exist if the Four Seasons Water Company were selected as the source supply, this option has been eliminated from further consideration.

1.4 Report Organization

The remainder of this report is divided into six additional sections. Section 2 describes the data acquisition tasks performed in gathering information for this evaluation as well as the basis for screening out three of the potential supply sources. Section 3 presents the description of the response scope (including the distribution system), the remaining four source supply options, and the associated transmission piping routes. Section 4 identifies Applicable or Relevant and Appropriate Requirements (ARARs) and requirements To Be Considered (TBCs). Section 5 presents the detailed analysis of the four source supply alternatives and Section 6 presents the comparative analysis of these alternatives. Finally, Section 7 presents a list of references that support this evaluation.

2 DATA ACQUISITION

This section describes the data acquisition activities that have been performed to characterize the source supply alternatives.

2.1 Sources of Existing Information

With the exception of the Route 376 Properties alternatives, the source supply options have been characterized based on existing data and information. This data gathering has focused on two characterization needs: 1.) Describing the physical and chemical characteristics of each source alternative (e.g., well yield and water quality), and 2.) Identification of potential sources of contamination that might impact future water quality. The following subsections describe the activities performed to gather existing data and other information for all four alternatives. With the exception of raw database search reports, documentation from sources described in the following subsections are included in Appendix A for the Town of Fishkill, Appendix B for the Dutchess County Pipeline and Appendix C for the Route 376 Properties.

2.1.1 EDR Database Searches

In determining the existence of potential sources of impact to water quality, efforts were made to identify known subsurface contamination problems within various radii from a source alternative. These radius searches are performed by commercial database services. For this project, commercial database reviews were conducted in February, 2002, and again in February and July, 2003, by Environmental Data Resources, Inc. (EDR) of Southport, Connecticut. EDR conducts a search of United States Environmental Protection Agency (USEPA) and New York State Department of Environmental Conservation (NYSDEC) environmental databases. Federal databases include The National Priority List (NPL), Proposed NPL, NPL Deletions, and The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), Resource Conservation and Recovery Information System (RCRIS), all of which relate to EPA regulated remediation activities. Federal databases also include information on companies that create, treat, store, transfer, or dispose of hazardous waste. NYSDEC databases include the Spills Information Database (NY Spills), which contains information on releases of potential hazardous materials into the environment, and the Leaking

Storage Tank Incident Reports (LTANKS), which is a listing of tank test failures, tank failures, or tank overfills. Information on existing and former landfills can be found in The Solid Waste Facilities/Landfill Sites database. State databases also contain information on the location of above ground storage tanks (ASTs) and underground storage tanks (USTs). All of the EDR reports generated for this project are reproduced herein on a compact disk (CD) attached hereto.

Information was requested from EDR for the Town of Fishkill's Snook Road Well Field, the Town of Poughkeepsie's Frank Well Field (which is a backup supply to the Dutchess County Pipeline), and the Route 376 Properties that are being evaluated as a source of locally-developed groundwater. A two mile search radius was conducted for each location. EDR divides its reports into mapped and orphan site sections. Mapped sites are those with addresses complete enough that they can be plotted on a map of the area. Orphan sites are those sites with incomplete street addresses (e.g., addresses including street names without street numbers) or addresses without street names (e.g., sites with rural delivery addresses or sites with P.O. Box addresses). For all sites, both mapped and orphan sites were identified by EDR. Significant findings from these searches are discussed in the evaluation of potential contamination sources in Section 3.

2.1.2 NYSDEC Files

After reviewing the EDR reports and gathering information from other sources, an initial Freedom of Information Act (FOIA) request was submitted to NYSDEC on March 8, 2002. Although the regional office in New Paltz, New York, contains records of spills and associated remediation activities for Dutchess County, files from both the Albany and New Paltz offices of NYSDEC were provided in response to this request. Since a year had elapsed between the submission of the initial request for files and the preparation of this report, the FOIA request was resubmitted on March 4, 2003, to ensure the most recent files could be reviewed. A GSC hydrogeologist, met with NYSDEC Regional Spills Personnel on March 14, 2003, to review records relating to historical spills. The interviewed Environmental Engineer Technician is responsible for responding to reported spills, and has knowledge of spills in the target areas. The meeting was also used to gather information that could be available for recent spills that may not have been updated in NYSDEC databases. Information gathered during this visit is discussed as part of the section on potential contamination sources in Section 3.

Subsequently, in July, 2003, the GSC hydrogeologist again contacted NYSDEC's New Paltz office to get the latest information on sites previously identified and to identify any new sites that are within the search radius for this project.

2.1.3 DCDOH Files

The Dutchess County Department of Health (DCDOH) retains files relating to public and private water supply systems in the county. Information found at the DCDOH includes well field studies, water quality data, and quantity of water produced. A GSC hydrogeologist reviewed files on the target sites on January 17, 2003, and March 17, 2003. Information obtained during these visits appears as part of the Capacity and Water Quality subsections in Section 3.

2.1.4 Local and County Water Authorities

Information on existing well fields was obtained through county and town agencies. The Dutchess County Water and Wastewater Authority oversees a number of public water supplies in the county. Publications prepared for this agency contain location, local geology and hydrogeology, and basic capacity information for the Frank Well Field. The Town of Fishkill provided studies of the proposed Snook Road Well Field, being developed by the Town for new water supply. Data for The Poughkeepsie Water Treatment Facility came from The City of Poughkeepsie and The Town of Poughkeepsie, who jointly own and operate The Poughkeepsie's Water Treatment Facility, and are responsible for disseminating information regarding this system to the public. The town of Poughkeepsie provided information on the Frank Well Field.

2.1.5 Published and Private Reports

United States Geological Survey (USGS) publications provide information on local and regional geology and hydrogeology. Much of the information regarding the Sprout Creek-Fishkill Creek Aquifer originates from USGS research, as does information on the bedrock geology of Dutchess County. USGS maps, including topographic quadrangles, provide useful information regarding surface water drainage. Drainage basin areas and location maps used in this report originate with quadrangle maps. Historical gauging station data for streams near the target sites come from USGS files.

Private reports provide some data on local water quality and regional geology. Documents from IBM were used to compile water quality data for Fishkill Hook Road in Wiccopee as well as basic data on regional geology, hydrogeology, and surface water flow. Four Seasons Water Corporation provided information and reports from their files used to evaluate system capacity and water quality.

2.1.6 Interviews, Meetings and Written Correspondence

Interviews, meetings and/or written correspondence were used to gather information from the following sources:

The Town of East Fishkill Supervisor, outside counsel and engineer.

The Town of Fishkill Supervisor, outside counsel and engineer.

The owner and engineer for the Four Seasons Water Corporation.

The IBM East Fishkill Plant Site water supply engineer.

NYSDEC regional and state level spill response personnel.

The NYCDEP deputy commissioner in charge of the Bureau of Water Supply.

2.2 Data Collection

Data collection activities were performed for two principal purposes: 1) to evaluate the two alternatives associated with the development of groundwater from the Route 376 Properties; and 2) to determine the eastern limit of the groundwater plume at the Site as it relates to the determination of the response scope. The following two subsections describe the work performed to meet these two needs.

2.2.1 Route 376 Properties Evaluation

The Route 376 Properties alternative involves a proposed well field located on one of two parcels along Route 376, immediately south of the village of Hopewell Junction (Plate 1). As such, these two parcels each represent a separate source supply alternative. This section discusses the groundwater exploration and characterization activities completed for Alternative 3 and 4. A detailed discussion of the results of these activities is presented in Appendix C1.

2.2.1.1 Groundwater Exploration

Preliminary assessment of the Route 376 Properties indicated that the site contained sand and gravel deposits of the Sprout Creek Aquifer, underlain with carbonate bedrock belonging to the Wappingers Group. These characteristics, along with the undeveloped nature and size of the property, suggested that the area was suitable for groundwater exploration. Groundwater exploration began on this property in the spring of 2002 with the siting of four preliminary test wells, TW-1, TW-2, TW-3, and TW-4 in low-lying areas of the site (Figure 2-1). Two additional well sites, TW-3A and TW-4A, were added to the preliminary test well list to better characterize the aquifer beneath two elevated areas on the property. After the necessary temporary wetland access permits were obtained, access roads to each of the drilling sites were constructed and drilling began in August 2002. After drilling at location TW-3 revealed a substantial thickness of sand and gravel, that well site was changed to a shallow and deep well pair, TW-3S and TW-3D. The locations of these exploration wells are shown on Figure 2-1 and well logs for each well are presented in Appendix C1.

2.2.1.2 Test Well Construction

Test well drilling and construction began in October 2002 after grain size analyses were conducted on the samples collected from each of the exploration wells were completed. The results of the grain size analyses were used to design screens for four proposed sand and gravel test wells. Two bedrock test well sites, TW-5 and TW-6, were also selected to assess the bedrock aquifer beneath the site. Once the test wells were completed, preliminary well yield and water quality testing was completed on each well to get an early indication of the yield and water quality available at each well. In addition, four supplemental observation wells were constructed to provide additional water level data during subsequent aquifer testing (OW-1 and OW-2 near TW-3 and OW-3 and OW-4 near TW-4AD, Figure 2-1). Well logs for each of these test wells and observation wells are contained in Appendix C1.

2.2.1.3 Aquifer Testing

Aquifer tests were performed on three of the five sand and gravel wells that preliminary yield tests suggested would produce at the highest rates. Aquifer tests were performed on TW-2A, TW-3, and TW-4AD in May and early June 2003. The tests included a step-drawdown test and a 72-hour constant-rate test for each well. Additional constant-rate tests were conducted on TW-3 and TW-4AD.

Detailed descriptions of the tests and results of the data analysis are presented in Appendix C1. The following paragraphs present a summary of the work performed and the results.

Wells monitored during the aquifer tests for each pumping well included the pumping well itself, adjacent onsite test wells and observation wells, and select offsite domestic and commercial water supply wells. Each well was monitored using automated dataloggers to collect continuous water level measurements before, during, and after each pumping test. Stream level measurements were also taken using staff gages installed at four locations in Gayhead Creek. Well and stream monitoring locations are shown on Figure 2-1.

The results of these long-term tests show that the sand and gravel aquifer at the locations of test wells TW-2A and TW-4AD is capable of sustaining a 100 gpm pumping rate in a properly constructed production well with substantial remaining available drawdown. The results of the aquifer test at location TW-3 show that the sand and gravel aquifer at this location would sustain a yield of 50 gpm without consuming all of the available drawdown and possibly a yield as high as 70 gpm in a properly constructed production well with better well efficiency than the test well. Contour maps of areal drawdown effects during each of these aquifer tests (Figures 2-2, 2-3, and 2-4) together with the actual data from each monitoring location show that there is no substantial effect of the operation of any of these test wells on adjacent water supply wells. Furthermore, stream gage monitoring during each test and shallow water level monitoring in wetland areas show that no significant effects were noted with respect to flow in Gayhead Creek or water level in adjacent wetlands. These observations are also described in more detail in Appendix C1.

Aquifer tests were not performed in the two bedrock test wells, TW-5A and TW-6, even though their blown yields were substantially higher than 400 gpm. It simply was not possible to develop them to the point where the turbidity of the water was low enough to permit discharge to Gayhead Creek or the wetland and filtration was impracticable.

A second constant-rate test was conducted on test well TW-4AD beginning on June 3, 2003 to assess the potential influence of pumping in TW-4AD on a gasoline UST site (see Mobil below) with a

documented tank leak that has produced a MTBE plume in the bedrock aquifer near the southern boundary of the project site. The service station is located along Route 52 approximately 1,500 feet south of TW-4AD. This second test was run because permission to access the gasoline station monitoring wells was not received from the owner and the consultant that monitors the site until after the initial TW-4AD pumping test was completed.

In addition to characterizing the aquifer beneath the site, an assessment was made with data collected from the second TW-4AD pumping test to determine if pumping in TW-4AD influences the observation well on the Mobil gas station site or those nearby that are within or near the contamination plume. Mobil monitoring well 6 (Figure 2-1), located on the northern edge of the gas station site, was monitored with a datalogger during the pumping test. This well has been reported to contain some of the highest concentrations of gasoline components of the wells on the gas station site. Data from the test indicated that this well was not influenced by pumping in well TW-4AD as water levels rose during the entire test period, a trend that started before the test began and continued after the test was completed. The Jake's Tex Mex well (Figure 2-1), located north of the gas station site, was also monitored continuously before, during, and after the pumping test. This well also did not respond to pumping in TW-4AD and like the Mobil MW-6 well, is believed to be a bedrock well. Well 1521 (Figure 2-1) appeared to draw down slightly during the test, with a total drawdown at the end of the test of 0.17 feet after removing the effects of a rain event that caused water levels to rise in a number of observation wells in the second half of the test. This drawdown value is similar to the amount of drawdown observed in the Hickman well located to the north, suggesting it is completed in the sand and gravel or in weathered bedrock that is hydraulically connected to the sand and gravel unit. These drawdown values are shown on the drawdown contour map in Figure 2-5.

Groundwater elevations for the four observation wells in this area were contoured to determine the direction of groundwater flow in this area under both static pre-test conditions and under pumping conditions. Groundwater elevation data from an early morning time was selected for contouring the static condition to eliminate any potential of domestic or commercial supply pumping effects. This data was contoured as shown in Figure 2-6 and shows the general direction of groundwater flow in this area is toward the west-northwest, in the direction of a mapped state wetland, which most reasonably

represents the discharge zone for groundwater originating in the vicinity of the Mobil Station. Groundwater elevation data from 3:00 on June 4th was selected to contour groundwater elevation data under stable pumping conditions and prior to the rainfall event that affected water levels in the latter portion of the test. This data is contoured in Figure 2-7 and indicates the direction of groundwater flow in this area has not changed with flow still oriented toward the west-northwest. For comparison purposes, groundwater elevations at the end of the test were contoured indicating no changes in the configuration of the groundwater surface at that time, as shown in Figure 2-8. From this analysis of the data, it can be concluded that the operation of test well TW-4AD has not changed the direction of groundwater flow associated with the plume of gasoline constituents reported to be emanating from this facility.

2.2.1.4 Surface Water Influence Testing

Field water quality samples were collected from the pumping well and the nearby stream sampling location that corresponded with the stream gage location. The samples were collected to determine if at any time during the test water from the stream was drawn into the well by comparing a few basic field parameters that included temperature, conductivity, pH, and turbidity. Sudden changes in the levels of one or more parameter may indicate an influence of pumping on the nearby stream. Field water quality data is presented in a table for each sampling location monitored for each test and contained in Appendix C2. Graphs of each parameter are also contained in Appendix C2 with well and stream results for each test paired for comparison. The comparison of field water quality data for the test wells and the stream show no evidence of surface water influence on these wells.

In addition to these field water quality samples, four microparticulate analysis (MPA) samples were collected from the three pumped test wells. A second MPA sample was collected from TW-3 to verify the results of the first and allow for comparison with the samples from the other two test wells. The results of the MPA samples collected from the test wells are tabulated along with the comprehensive new source sample results for each well in Appendix C2. The parameter list for this analysis included: diatoms, algae, insect parts, crustacean parts, rotifers, plant debris, coccidian oocysts, and Giardia. The MPA analytical results indicated that all parameters were absent in each of the MPA samples collected.

These results indicate that TW-2A, TW-3, and TW-4AD are not under the influence of surface water after pumping for a period of more than 48 hours.

2.2.1.5 Groundwater Quality Testing

Comprehensive new source samples were collected from each well near the end of each pumping test. The test parameters for each of the samples included pesticides, herbicides, volatile organic compounds, synthetic organics, metals, bacteria, radionuclides, and several general water quality characteristics. Complete results of the groundwater sampling are included in Appendix C2. The results of these sample analyses show that none of the New York State primary drinking water standards or Federal Maximum Contaminant Levels (MCLs), are exceeded in any of the test wells. One secondary standard for combined manganese and iron was exceeded in test wells TW-3 and TW-4AD due to the presence of manganese at levels around 600 ug/L. The standard is 300ug/L. This is an aesthetic standard associated with discoloration of clothes and plumbing fixtures that may result from precipitation of manganese from the water. However, as discussed later in this report, this problem with manganese can be managed through the use of a sequestering agent to prevent the manganese from precipitating.

2.2.2 Response Scope Delineation

The response scope for the Shenandoah Site is comprised of two factors: the geographical extent of the service area and the average and peak demands of this area for water supply. Both are discussed in Section 3. Defining the former, however, required the collection of additional data at the Site. This section discusses that monitoring well drilling activities and the results of the groundwater sampling.

During the Initial Groundwater Investigation at this Site, ten monitoring wells at locations SRMW-1 through 6 were drilled and sampled around the apparent perimeter of the groundwater plume from September 2001 to January 2002 in an effort to define the extent of groundwater contamination (Figure 2-9). Groundwater sampling results of this initial series of monitoring wells indicated that additional delineation work was necessary along the northeastern plume boundary as low concentrations of constituents of concern were detected in monitoring wells SRMW-2R and SRMW-2S. Furthermore, even though two wells installed on the east side of Gayhead Creek exhibited artesian water levels, EPA

requested that a second pair of wells be drilled in this area to reinforce the conclusion that the creek is a hydrologic boundary beyond which the groundwater containing contaminants could not migrate.

To respond to these data needs, seven additional monitoring wells were drilled at locations SRMW-7 through SRMW-10 in January 2003 and March 2003 (Figure 2-9). Five monitoring wells comprising two well pairs and one solitary bedrock well, were drilled at three locations (SMRW-8, 9 and 10) in a line oriented north-south from Jackson Road and east of wells SRMW-2R and SRMW-2S. The purpose of these five wells was to establish an eastern limit for the groundwater plume. An additional well pair was drilled between Gayhead Creek and the Taconic Parkway at location SRMW-7 to reinforce the understanding of the creek's effectiveness as a hydrologic barrier. At each location where a well pair was installed, the pair included a bedrock monitoring well and a soil monitoring well. Geologic and well construction logs for these wells are included in Appendix D1.

After drilling was completed at each location, each well was developed according to the protocols for well development and purging which are contained in the Initial Groundwater Investigations Quality Assurance Project Plan. Groundwater was purged by applying a low flow purge method using a variable-speed submersible pump until field parameters stabilized. Immediately after purging was complete, a groundwater sample was collected directly from the pump discharge tubing under low-flow conditions into laboratory-provided containers for immediate shipment to Severn Trent Laboratories in Newburgh, New York. A second round of sampling was also performed in the same manner after field parameters stabilized in each well. All groundwater samples were analyzed for TCL volatile organic compounds and MTBE by Method 8260B.

The results of two rounds of sampling at these seven wells indicate that the concentrations of constituents of concern were non-detect in all of the samples. Analytical reports of the groundwater samples collected along with a tabulation of field parameters are presented in Appendix D2.

Water level data were collected from all monitoring wells on July 23, 2003. These water level data are presented in Table D-1 in Appendix D1. Depth to water in the vicinity of Jackson Road ranges between approximately 40 feet and 60 feet depending on the topographic setting of the well. Artesian conditions

exist in the valley between Shenandoah Mountain and Honness Mountain to the south. Wells SRMW-5R and SRMW-5S were flowing during both rounds and SRMW-7R continues to have a static water level higher than ground surface. This pattern of groundwater chemistry and elevation establishes that Gayhead Creek is a hydrologic boundary beyond which the plume will not migrate and the line of wells arrayed north and south of Jackson Road define an eastern limit for the plume.

3 DESCRIPTION OF ALTERNATIVES

This section begins with a subsection that defines the response scope in terms of the supply requirements and service area, including a conceptual description of the distribution system. Three subsequent subsections then describe the source supply alternatives that have been identified to provide an alternate water supply for the Site. These subsections include descriptions of the associated transmission piping necessary to implement each of these alternatives.

3.1 Response Scope

As noted previously, the response scope is comprised of the service territory and the normal and peak demands of the water supply necessary to serve that territory. The following two subsections define these two components of the response scope.

3.1.1 Service Territory

The extent of the service territory for this alternate water supply response action has been determined based on the monitored extent of the groundwater plume and knowledge of the hydrogeology of the Site. Figure 3-1 shows the extent of the Site plume that has been drawn on the basis of groundwater monitoring performed under the residential well sampling program, in the fifteen monitoring wells drilled and sampled for this purpose, and in one pre-existing monitoring well. All of these wells are shown on Figure 3-1. This figure also shows the locations of the two well pairs east of Gayhead Creek that have been used to establish that this creek is a hydrologic boundary beyond which the plume cannot migrate.

On the basis of these technical considerations and following approval from EPA, the service territory has been defined as including all shaded properties on Figure 3-1 (on which an occupied dwelling already exists) plus imbedded vacant properties for a total of 154 properties. Also shown on this figure is separate shading of the public roads and private rights-of-way along which the distribution mains for this service territory will be constructed as described in a later section. Any lot with road frontage that is so shaded is included in the service territory whether it is occupied or not.

The basic water distribution and storage system for the SST includes: 20,000 linear feet of 8-inch diameter distribution piping to be installed along the public and private rights-of-way shown on Figure 3-1, 40 hydrants, 24 gate valves, house services, house connections, a 150,000 gallon storage tank, and numerous appurtenances and incidentals to the installation of the water system. The elevated storage tank is sized to meet fire protection requirements and to provide emergency storage. A location for this tank has not been selected. However, it is anticipated to require less than one-eighth of an acre of land, not including an access road.

3.1.2 Normal and Peak Demands

The basis for calculating the water supply needs of this project involves providing a community water system for the Shenandoah Road Groundwater Contamination Superfund Site. Based on the areal extent of the service territory (Figure 3-1), it has been determined that a potable water supply will be extended to approximately one hundred and fifty-four (154) properties in the Shenandoah Road area. Table 3-1 summarizes the breakdown of these properties and shows an estimated population of 410.

Table 3-1
Population Estimate and Property Types
Proposed Shenandoah Service Territory

Estimated Population	**410**
No. of Residential Homes-occupied	**134**
No. of Commercial/Other Lots	**3**
No. of Vacant Lots	**17**
Total Lots	**154**

There are two methods available to estimate the average and maximum daily demands for this project. They are the population method and the bedroom method. Table 3-2 presents the calculated average and maximum daily demand using each of these methods. Since use of the more conservative Estimated Number of Bedrooms Method is required by the health department, it will be assumed in the evaluation of alternatives that, including a ten percent safety factor, an average daily demand of 80,000 gallons per day will be required to satisfy regulatory requirements for service to this area, but that actual

usage will be in the range of 30,000 - 35,000 gallons per day. Maximum daily demand will be assumed to be 132,000 gpd, likewise with a ten percent safety factor.

Table 3-2 Anticipated Average & Maximum Daily Demands Proposed Shenandoah Service Territory	
a. Estimated Population Method	
Estimated Population	410
Residential Average Daily Demand (gallons per day) (1)	30,750
Non-Residential Establishments	3
Non-Residential Average Daily Demand (gallons per day)	2,000
Average Daily Demand by Population Method (1)	32,750
Maximum Daily Demand by Population Method (2)	54,040
b. Estimated Number of Bedrooms Method	
Estimated Number of Bedrooms (3)	471
Residential Average Daily Demand (gallons per day) (4)	70,650
Non-Residential Average Daily Demand (gallons per day)	2,000
Average Daily Demand by Bedroom Method (4)	72,650
Maximum Daily Demand by Bedroom Method (2)	119,872

(1) : This is based on the NYSDOH recommendation of 75 gallons per day per person.

(2) : This is based on a ratio of 1.65/1 for Maximum Daily Demand/Average Daily Demand.

(3) : This is based on an assumption of an average of 3.5 bedrooms per home.

(4) : This is based on the NYSDEC recommendation of 150 gallons per day per bedroom.

3.2 Description of Source Alternatives

As noted above, there are four viable alternatives to be evaluated for the purpose of supplying the water supply needs of the Shenandoah Site. These are:

Alternative 1: Town of Fishkill

Alternative 2: Dutchess County Pipeline

Alternative 3: Route 376 Properties- Parcel A (South Parcel)

Alternative 4: Route 376 Properties-Parcel B (North Parcel)

The following subsections describe each of these alternatives. Each of these alternatives includes a description of transmission piping to be installed between the supply source and the SST. This piping differs from distribution piping (Section 3.1.1) in that it transmits water from the source to the SST, while distribution piping distributes that water within the SST.

3.2.1 Alternative 1: Town of Fishkill

The Town of Fishkill alternative includes the Snook Road Well Field, proposed transmission piping from that well field to Route 52 (to be installed by the Town of Fishkill and the developer of a project in this area), planned storage anticipated to be constructed on adjacent Honness Mountain and the transmission piping from the Town of Fishkill to the Shenandoah Site. The following subsections describe each of these elements of this alternative, which are shown on Figure 3-2.

3.2.1.1 Snook Road Well Field

The Snook Road Well Field is situated on 5.5 acres of land located adjacent to the eastbound entrance ramp to Interstate 84 (Figure 3-2). The property is bounded to the north by I-84, to the east by privately owned land, to the south by Snook Road, and to the west by a property maintained by the Fishkill Historical Society. The private land to the east of the site contains a low-density residential development and undeveloped tracts. Commercial properties line Route 9 to the west of the site.

3.2.1.1.1 Capacity

A single 12-inch test well, T-1, was completed in April, 1989. Twenty feet of 0.080-slot stainless steel telescoping screen was installed to a depth of 83 feet, screening the outwash sand and gravel. Twelve-inch steel casing extends to the surface, where it is protected by 10 feet of 16-inch casing. Two pumping tests conducted at well T-1 indicate the well field has substantial water supply potential. In May, 1989, Dunn Geoscience Corporation (Dunn, 1990) performed a 72-hour pump test at a rate of 1,078 gpm. Only 6.5 feet of drawdown was observed, and recovery to pre-test water levels occurred

within 10 hours. Specific capacity was reported as 162.6 gpm/foot of drawdown. The last half of the test was influenced by a significant rain event, which caused a rise in water level despite the significant pumping rate. According to the final report, the well field may be capable of producing over 2,100 gpm, or roughly 3.0 MGD with an additional well (Dunn, 1990). In November, 2000, Leggette, Brashears, and Graham, Inc. conducted a 30-hour pump test at 1,100 gpm, and observed 6.2 feet of drawdown with a specific capacity of 177.4 gpm/foot of drawdown. Recovery was slower than the initial test because there was no significant precipitation. T-1 recovered to 87 percent of full recovery in 3.5 days. The associated report confirms the initial finding that the Snook Road Well Field has the potential to produce 3.0 MGD. Installation of a second well is planned for 2003 as a back-up to the current production well.

3.2.1.1.2 Water Quality

As part of both tests, water quality samples were taken from the test well (Appendix A). Water quality samples were taken on May 12, 1989, by WaterTest Corporation of America of Manchester, NH, and on November 2, 2002 by OCL Analytical Services of Bloomingburg, NY. In both tests, all parameters were within the requirements of NYS Part 5 Drinking Water Standards. Elevated sodium and chloride levels are present at this site, likely a result of deicing salt applied to I-84 and Route 9. Sodium/chloride levels were measured at 34.9 mg/l and 79.5 mg/l respectively in 1989, and at 80.9 and 103 mg/l during the year 2000 tests. Chloride levels are well below the MCL of 250 mg/l. The New York State Department of Health (NYSDOH) must be notified if sodium levels exceed 20 mg/l and consumers must be notified if sodium levels exceed 270 mg/l.

3.2.1.1.3 Geology and Hydrogeology

The Snook Road Well Field is located within the Sprout Creek-Fishkill Creek aquifer defined by Moore, LaFleur and others (1982). Wells logs indicate a dense surficial layer of sand, silt, and gravel extending from 8 to 20 feet below ground surface. This unit may be analogous to Woodfordian lodgment till mapped to the west of this site by LaFleur (1981). A mix of glaciofluvial outwash sand and gravel extends beneath the dense surficial unit to a depth of 111 feet in one location. Beneath the sand and gravel unit is a layer of fine sand, silt and clay.

A northeast to southwest trending thrust fault separates the Hudson Highlands gneiss found on Honness Mountain from the Wappinger Group carbonates found beneath the Fishkill Creek valley. Previous investigations have indicated that the Wappinger Group carbonates underlie the site, although there is no confirmation of this indicated in any well logs.

Moore, LaFleur and others (1982) identified two principle directions of shallow groundwater flow in the vicinity of the Snook Road Well Field. Groundwater flows from south to north in the unconsolidated sediments of the Clove Creek Valley, while flow generally moves from east to west along Fishkill Creek. Groundwater from bedrock aquifers likely discharges from the gneiss bedrock into the shallow sand and gravel aquifers and the carbonate bedrock of Clove Creek and Fishkill Creek. The extent and magnitude of potential recharge from the bedrock aquifers is unknown. Data from the 1990 pumping test show groundwater flow on the site in the shallow unconfined aquifer is generally from east to west.

Moore, LaFleur and others (1982) indicated infiltration rates at the Snook Road Well Field were moderate to high. Estimated infiltration rates for this area are between 2.0 to 6.0 inches per hour, indicating significant recharge of the aquifer occurs during precipitation events. Analysis of the 72-hour pump test confirm this theory, as water levels in the production well increased during the test due to a significant rainfall event (Dunn, 1990).

3.2.1.1.4 Potential Sources of Contamination

The EDR records indicate there were several spills in the area associated with traffic accidents, including one on Snook Road. All of these spills were cleaned up immediately, and do not appear to have impacted groundwater quality. The EDR review does not show any spills that could be potential contamination sources.

One issue of note is the increase in sodium and chloride levels detected in the production well during the second pump test. As noted previously, sodium levels doubled during this time period separating the first and second pump tests, and chloride levels rose by over 20 mg/l. The increase in these concentrations suggests that current deicing activities along Route 9 and Interstate 84 may be affecting

groundwater quality at the site. Chloride levels are still well below the MCL of 250 mg/l. It should be noted that the production well at Snook Road is not continuously pumped, and long term pumping could increase or decrease sodium and chloride levels.

3.2.1.2 Existing and Planned Distribution Piping

The Town of Fishkill has indicated that distribution piping would be extended to NYS Route 52, immediately southeast of the Brinkerhoff Bridge, as part of its water district project (shown conceptually on Figure 3-2). This location is approximately 4000 feet from the Town of East Fishkill boundary line with the Town of Fishkill. Preliminary planning approvals have been received and work has begun on physical access elements of the project. The work is scheduled to be completed in September 2004. Distribution piping is planned to be 12 inch Ductile Iron, Class 52 from the Snook Road Well Field to NYS Route 52.

3.2.1.3 Planned Storage

The Town of Fishkill water project would include a 1,000,000 gallon water storage tank with a base elevation of 452 ft USGS and a top elevation of 492 ft USGS. This work is scheduled to be completed in mid-2004. This tank is planned to be constructed on adjacent Honness Mountain, as shown conceptually on Figure 3-2.

3.2.1.4 Transmission Piping

The transmission piping route necessary to implement this alternative involves the installation of a water transmission main from the Town of Fishkill Water System (proposed Merritt Park Water District) to the Shenandoah Road Site (Figure 3-2). The starting point assumed in this analysis is on Route 52, approximately 4000 feet west of the Fishkill/East Fishkill town line at Wiccopee. The route involves installation of a main transmission line easterly along Route 52 for a distance of approximately 14,000 feet to Shenandoah Road. The route continues southeasterly along Shenandoah Road for a distance of approximately 8,400 feet, to the northerly terminus of the Site.

There is one major creek crossing, the Wiccopee Creek, and three minor creeks crossing associated with this route. Other challenges associated with this route include extensive work in the N.Y.S. Route 52 right-of-way with limited shoulder areas and high traffic control requirements.

Starting elevation of this route is 230 +/- and ending elevation is 330 +/- (difference = 100 ft or 43 psi static). Total transmission distance is 22,400 ft +/-.

3.2.2 Alternative 2: Dutchess County Pipeline

The second alternative to be described is the Dutchess County Pipeline. This alternative involves the transmission of water drawn by the City and Town of Poughkeepsie primarily from the Hudson River to the Southern Dutchess County Area. The components of this alternative are shown on Figure 3-3 and Plate 1. Two (2) MGD of water is being initially purchased by IBM, with an option to purchase an additional 2.0 MGD.

3.2.2.1 Supply System Elements

The elements of this alternative include the Hudson River Surface Water Intake, the Water Filtration Plant jointly owned by the City and Town of Poughkeepsie, transmission mains, the Fairview Pump Station, backup supplies from the Frank Well Field (described in Section 3.2.2.1.2) and a proposed 13 mile +/- pipeline to be constructed by the Dutchess County Water and Wastewater Authority to the IBM East Fishkill Plant Site (Gate 1 on south side of NYS Route 52) (Figure 3-3 and Plate 1). With the exception of the surface water intake, the Water Filtration Plant and the Frank Well Field, all other items are considered transmission facilities. This subsection will describe these non-transmission elements and a subsequent subsection will describe the proposed pipeline.

3.2.2.1.1 Surface Water Intake and Filtration Plant

Water supply from the Dutchess County Pipeline would consist of treated surface waters of the Hudson River filtered at the Poughkeepsie Water Filtration Plant. The plant is located along the Hudson River within the Marist College complex. At present, the Poughkeepsie Water Treatment facility is owned by the City of Poughkeepsie and Town of Poughkeepsie.

Currently, upgrades to the Water Treatment Facility are being accomplished in phases with all phases scheduled for completion in April 2005. These upgrades include both capacity and treatment enhancements.

The Poughkeepsie Water Filtration Plant includes the following basic components:

Intake System: Low Lift Pumps are adequate to provide 21.3 MGD from the intake lines of the Hudson River, adjacent to the Water Plant. The intake is reportedly 1000 feet from the east shore of the River and 48 feet below the mean sea level.

Rapid Mix: Dedicated basins with mechanical mixing equipment to promote uniform dispersion of coagulant chemicals throughout the influent water.

Solids Contact Clarifiers: Solids Contact Clarifiers provide flocculation and sedimentation in one unit process.

Sedimentation Basins: These units provide additional settling/clarification after coagulation and flocculation are complete. Pre-filtration disinfection is also provided at this point in the process. Chlorination is being replaced by UV as part of the plant upgrade.

Aeration Basins: Aeration is provided for taste and odor control and is not a required treatment process.

Filtration: Filtration units provide the final suspended solids removal of the water, which has been pre-treated by coagulation, flocculation, and sedimentation. Existing filter units are being upgraded as part of the Water Plant improvement plan. Currently, filters are dual-media sand and anthracite.

Clearwell: The Clearwell provides storage of finished (filtered) water for filter backwash purposes.

Equalization Basin: The equalization is designed to provide adequate holding time for high-lift pumping operations. Improvements in chlorine contact time are recommended as part of the Water Filtration Plant improvement project.

High Lift Pumps: There are four high lift pumps which transfer the filtered water into the Poughkeepsie distribution system. The pumps are being upgraded to provide 21.3 MGD capacity with the largest pump out of service. Surge protection is also being added.

Disinfection/Chemical Feed Systems: Disinfection of the filtered water is provided by chlorination. The gas chlorination system is being replaced with a liquid chlorination and liquid ammonia system . All chemical feed systems are also being replaced and upgraded as part of the Water Filtration Plant improvements. These include: alum or polymer (coagulant), orthophosphate (corrosion control), hypochlorite (disinfection), fluoride (dental health), and ammonia (disinfection by-products).

3.2.2.1.1.1 Capacity

The approved capacity of the plant is 16 MGD and the combined peak daily demand of the City of Poughkeepsie and Town of Poughkeepsie is 9.35 MGD. Upon completion of upgrades in 2005, the Town is committed to expand the plant to a minimum of 19.3 MGD with a goal of 21.33 MGD, at which point, the Town will no longer need their wells.

3.2.2.1.1.2 Water Quality

Influent sampling also includes annual analysis for volatile organic compounds. The 2001 sampling event showed MTBE at 1.0 ug/l and toluene at 1.2 ug/l. These parameters have not been detected in other influent samples dating back to 1999 or in any effluent samples taken from 1999 to 2002. No other volatile organic compounds have been detected in the influent during this time period.

Review of the analytical testing of finished water (effluent) from the Poughkeepsie Water Filtration Plant for the years 2000, 2001 and 2002 indicates excellent finished water quality. The facility monitors source, treated and distribution system water. Testing includes: total coliform, turbidity, inorganic compounds, nitrate, nitrite, lead, copper, volatile organic compounds, total trihalomethanes, and synthetic organic compounds.

With the exception of rare and minor exceedances in turbidity (NTU's) and total trihalomethanes (TTHM's), water quality is consistently within all federal and state drinking water standards. Sodium

and chloride levels vary and increase during drought conditions due to the northerly migration of the salt front in the river. In 2001, sodium levels increased to a high of 63.8 mg/l and chlorides increased to a high of 80.6 mg/l. Normal chloride levels at the plant are 10-15 mg/l.

The treatment facility analyzes for TTHM's, which are produced from chlorination of the water. The sum of chloroform, bromoform, bromodichloromethane, and chlorodibromomethane, are sampled on a quarterly basis at four locations along the distribution system. Beginning in 1999, the NYSDOH standard has been 80 ug/l for TTHM's. Of the 60 samples taken between the first quarter of 1999 and August, 2002, 20 of the 60 samples taken have exceeded the standard, with the highest value of 139 ug/l occurring in August, 2001. The running quarterly average over this time period has ranged from 61.1 to 74.8 ug/l.

Haloacetic acids, which represent the sum of monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid, have also been sampled since 1999 on a quarterly basis at four locations. The standard established in 1999 was 60 ug/l. Eleven of the 60 samples taken have exceeded this standard. The maximum recorded value was 121 ug/l, recorded in July, 2000. The running quarterly average over this time period has ranged from 16.3 to 68.4 ug/l.

Treatment enhancements currently being constructed at the plant are specifically targeted to meeting the enhanced filtration requirement of 0.3 mg/l NTU, TTHM of 80 ug/l and haloacetic acids of 60 ug/l.

Beginning in February, 1998, the Poughkeepsies' Water Treatment Facility has run monthly sampling for polychlorinated biphenyls (PCBs) in the intake (influent) water from the Hudson River. The facility has tested for six different species of PCB. Based on sample results through August 2003 (the last available data for the plant), PCBs have never been detected. If they were detected in monthly sampling, the NYSDOH would require source treatment to remove them. Most detection limits for the analyses were 0.01 ug/l, more than an order of magnitude below the NYSDOH MCL of 0.5 ug/l. PCBs have also not been detected in the treated plant effluent during this time period.

3.2.2.1.2 Frank Well Field

The Frank Well Field represents a backup supply for the pipeline to be used primarily during periods of peak demand. The well field is located in the Town of Poughkeepsie, south of Overlook Road on the West bank of the Wappinger Creek (Figure 3-3). The three wells are completed to depths of 48, 52, and 55 feet below ground surface, and are within 65 feet of the creek. The three wells supplement the Town of Poughkeepsie water supply discussed in the previous sections.

3.2.2.1.2.1 Capacity

The Frank Well Field is used primarily as a supplemental water supply in times of peak demand and during emergencies. These wells are also run once per month to maintain operation status. The wells are capable of producing 660, 356 and 356 gallons per minute. Water is chlorinated before distribution (Horsley Witten Hegemann, Inc., 1992).

3.2.2.1.2.2 Water Quality

Two sampling events in November, 2002, as well as data from 1999 and 2001, indicate that there are no current water quality problems at the site (Appendix B1). VOCs were not detected using EPA method 502.2 during any of the sampling rounds, and all parameters tested met NYSDOH Part 5 Drinking Water Standards. Maximum total hardness levels at the three wells were 236, 208, and 288 ug/l. The highest sodium values for the three wells were 36.4, 34.0, and 69.8 mg/l, together with 62, 61.7, and 112 mg/l of chloride, respectively. These values are nearly identical to available data from 1999 and 2001. Pesticides and PCBs were tested for during the 2001 sampling event, and were not detected.

3.2.2.1.2.3 Geology and Hydrogeology

Bedrock in this segment of the Wappinger Creek valley consists of Wappinger Group carbonates, found along the western boundary of the site, and the Snake Hill shale, found directly beneath the production wells (Fisher and others, 1970). Three distinct, discontinuous glacial deposits cover the shale. The lower unit consists of a 0 to 15 feet thick, compact layer of silty to gravelly till. Above this unit is a sequence of lacustrine clay and silt ranging from 0 to 55 feet thick. The upper glacial unit is

approximately the same thickness as the lacustrine unit, and consists of sand and gravel. The production wells are completed in this sand and gravel unit, which is analogous to the outwash sand and gravel units of the adjacent Sprout Creek-Fishkill Creek aquifer.

Regional groundwater flow within the unconsolidated sediments is north to south along the trend of the Wappingers Creek. Chazen (1991) studied groundwater flow to the wells and determined that under non-pumping conditions, groundwater flowed west to east from the aquifer to the Wappinger Creek. Under pumping conditions, groundwater flows from both the east and the west side of the creek, supplying the wells. Part of the well yield also comes from the creek through induced infiltration into the unconfined aquifer. The contribution of the creek to the well field means low-flow discharge must be sufficient to maintain well yields. Ayer and Pauszek (1968) analyzed data from the Wappinger Creek near Red Oaks Mill, approximately three miles downstream from the well field. They determined that the average seven-day low flow with a recurrence interval of 10 years is 4.4 MGD (Horsley Witten Hegemann, Inc., 1992).

3.2.2.1.2.4 Potential Sources of Contamination

The EDR and NYSDEC records (Appendix B2) indicate a number of potential sources of contamination along Route 44, Route 55, and the eastern edge of the City of Poughkeepsie. Two of these sites where historic releases occurred are within a half-mile of the Frank Well Field and warrant discussion. Although onsite monitoring wells indicate that groundwater flow in the shallow aquifer is to the northeast, away from the Frank Well Field, conditions associated with these two spills are discussed below due solely to their proximity to the well field.

The first of these spills occurred at an abandoned service station located at the intersection of Overocker Road and Route 44 (Service Station Spill Site #1 on Figure 3-3) (documentation in Appendix B2). Approximately 10 feet of sand and silt overlies an additional 6 feet of gravel and sand. Bedrock consists of the Snake Hill shale at roughly 16 feet below grade. In August, 1994, seven underground storage tanks were removed, along with 1,074 tons of contaminated soil. Eight groundwater monitoring wells were constructed in the shallow sand and gravel aquifer present on the site. Maximum total BTEX, the sum of benzene, toluene, ethylbenzene, and xylene, found in the two downgradient property

perimeter wells occurred in 1992 with a detection of 114.3 ug/l. Analysis for methyl tert-butyl ether (MTBE) (a gasoline additive) began with a 1995 sampling round, when the maximum on site concentration of 3,300 ug/l was found in a perimeter well. The most recent sampling of the perimeter wells occurred in 1998. BTEX compounds were not detected, while 44 ug/l of MTBE was present. Four wells located in the interior of the site were sampled in June, 1999. MTBE concentrations ranged from non-detect to 25 ug/l, while BTEX compound concentrations ranged from non-detect to 20 ug/l. No groundwater monitoring was completed off site. In 1999, NYSDEC concluded that no further action was necessary at this site.

The second spill of concern occurred at a former service station located at the intersection of Overlook Road and Route 44 (Service Station Spill Site #2 on Figure 3-3) (documentation in Appendix B2). The site has been abandoned since 1976, when former tanks were removed. Remedial activity began in September, 1994, and continued through August, 1995. Soil borings indicate that unconsolidated sediments consist of 2 to 5 feet of silt, fine sand, and rock fragments at the surface. From 5 to 9 feet below grade, medium sand with rock fragments with some silt was encountered. The final sequence consisted of silt, some clay, and little fine sand, and extended to a depth of 15 feet. Depth to bedrock ranged from 3 feet on the eastern segment of the site to 15 feet to the west. Data indicates groundwater flow is from east to west, away from the Frank Well Field.

Samples taken at the former service station showed BTEX compounds as high as 71,879 ug/kg in soil samples and 48,286 ug/l in groundwater samples. Samples taken at the western (downgradient) boundary of the site showed total BTEX concentrations as high as 1,456 ug/l, indicating that contaminants have migrated off the site. MTBE was not detected in any of these soil or groundwater samples. No groundwater monitoring was conducted off site.

As a result of the contamination documented above, 168 tons of soil were removed near the former tank area and the former pump island. In addition, 7 monitoring wells were installed downgradient of the former tank area and on the perimeter of the downgradient (western) edge of the property. Three of the wells were completed in bedrock, although the location and identity of these wells can not be determined from available documents. The seven monitoring wells were sampled once, in September,

1995. Results show that only a single well contained BTEX constituents, with a concentration of 481 ug/l. MTBE was detected in this well at 120 ug/l. MTBE in the remaining wells ranged from non-detect to 3.3 ug/l. This file is currently active, although the owner has requested that no further action be required at the site. Records relevant to this location are found in Appendix B2.

Again, however, while conditions associated with these sites are presented in this report, they do not appear to threaten the Frank Well Field.

3.2.2.2 Proposed Pipeline

The Poughkeepsie Pipeline is being designed under the auspices of the Dutchess County Water and Wastewater Authority. It will convey potable water a distance of approximately 13 miles, principally along and through the County-owned railroad corridor right-of-way to the IBM Plant boundary (Plate 1). Water will comply with federal and state drinking water standards and will be delivered at a minimum pressure of 60 pounds per square inch (psi).

3.2.2.2.1 Design and Construction Schedule

Detailed design of the pipeline and pump station improvements is currently completed and has been submitted to the appropriate regulatory agencies for permitting. Construction has a target completion date of September 1, 2004 and a final completion date of December 31, 2005. For purposes of this report, a December 31, 2005 completion date is utilized.

3.2.2.2.2 Capacity

The pipeline will have a hydraulic capacity of 8.0-12.0 MGD. The pump station will have a capacity of 15.0 to 17.5 MGD of which 10 MGD will be reserved by the Town of Poughkeepsie and 5.0 to 7.5 MGD will be reserved by the Dutchess County Water and Wastewater Authority. Of this 5.0 to 7.5 MGD, 4 MGD will be reserved to IBM and an additional 1.0 MGD will be subject to the right of first refusal by IBM. IBM will initially take 2.0 MGD from the pipeline. IBM has the right to assign a portion of its capacity sufficient to supply the Shenandoah Site.

3.2.2.3 Transmission Piping

The transmission piping route necessary to implement this alternative assumes that the pipeline will be brought to Route 52 at Gate 1 of the IBM East Fishkill Plant Site (Plate 1). From the starting point, the route overlaps a portion of the route required to connect the Town of Fishkill Water System to Shenandoah Road. The route involves installation of a main transmission line easterly along Route 52 for a distance of approximately 3,400 feet to Shenandoah Road. The route continues southeasterly along Shenandoah Road for a distance of approximately 8,400 feet to the northerly terminus of the Site.

Starting elevation of this route is 262 +/- and ending elevation is 330 +/- (difference =68 ft or 29 psi static). Total transmission distance is 11,800 ft +/-.

3.2.3 Alternatives 3 and 4: Route 376 Properties

This subsection describes the two alternatives associated with Parcels A (south parcel) and B (north parcel) of the Route 376 Properties. As shown on Figure 3-4, Alternative 3 is associated with the potential development of the southern parcel (Parcel A) and Alternative 4 is associated with the potential development of the northern parcel (Parcel B).

3.2.3.1 Supply System Elements

The supply system elements of Alternatives 3 and 4 consist of a well field, conveyance piping to the public right-of-way with an associated access road, and a treatment building to house a chlorinator and other treatment equipment, if necessary. The following subsections describe these elements of the supply system.

3.2.3.1.1 Well Field

Each alternative requires the construction of two production wells, so that either well can supply the needs of the service area if the other is shut down (Chapter 1, NY State Sanitary Code, Part 5-Drinking Water Supplies, Subpart5-1-Public Water Systems). As shown on Figure 3-4, all wells would be located at a minimum of 200 feet from the property line of the parcel on which they would be constructed and at least 200 feet from Gayhead Creek. This latter setback is to minimize concerns about

surface water influence, even though the surface water influence testing performed as part of this evaluation indicates no such influence occurs.

3.2.3.1.1.1 Geology and Hydrogeology

LaFleur (1981) reported that surficial deposits consisted of Woodfordian outwash gravel, with areas of Holocene alluvium in the vicinity of Gayhead Creek. With the exception of the western edge, the entire property is located within the Sprout Creek-Fishkill Creek aquifer defined by Moore, LaFleur and others (1982). Topography is flat throughout most of the northern part of the property. Several sand and gravel eskers dot the southwestern edge of the property, providing roughly 15 feet of elevation change. Elevation also increases in the southeast in areas where dolostone bedrock outcrops.

Geologic and well construction data collected during the initial exploratory phase of the project was used to construct a north-south oriented stratigraphic cross section of the site shown on Plate 2. Geologic data collected during subsequent drilling was added to better define the bedrock surface and show the test well screen positions. The cross section shows that the bedrock surface beneath the site is approximately 52 feet below grade at TW-1, increasing toward the south to a depth of 241 feet at TW-6. Bedrock is covered by a lodgement till layer that thickens toward the south. Overlying the till is the primary aquifer of the site, a sand and gravel unit that varies in thickness and composition. Generally, the sand and gravel unit is thinnest in the northern part of the site and becomes thicker and occurs at a greater depth in the southern half of the site. Overlying the sand and gravel unit is a fine sand and silt unit with some clay, laminated in places, that extends to ground surface across the site. Occasional sandy and thin gravelly zones occur in the upper portion of this unit. A relatively thin alluvial/wetland deposit covers much of the low-lying areas of the site. Two prominent hills composed of brown sand and gravel occur on the site at the TW-3 well cluster and at the TW-4AD well cluster. These upland areas have an elevation of approximately 15-20 feet higher than the surrounding wetland, the southernmost having been quarried for sand and gravel in years past. This quarrying operation has removed most of the center and southern portion of the mound to an elevation just above that of the surrounding wetland. A third elevated area occurs as a thin ridge in the western part of the site, west of the TW-3S and TW-3D well pair, and is not shown on the cross section.

3.2.3.1.1.2 Water Quality

Tabulated sampling results from wells on these two parcels are presented in Appendix C2. As noted in Section 2, samples collected from TW-2A (Alternative 4) and TW-4AD (Alternative 3) indicate that no primary drinking water standards are exceeded at either location. However, the combined manganese/iron secondary standard is exceeded in the analyses for well TW-4AD due to the presence of manganese at concentrations on the order of 600 ug/L. This is an aesthetic standard and the associated problem can be overcome through the use a sequestering agent to prevent the manganese from precipitating.

In addition to this one issue relating to a promulgated standard, the water at both locations exhibits high hardness (300 mg/L plus or minus 10%). There is no drinking water standard for hardness, but its presence in drinking water often leads users to install water softeners in their homes. One other aspect of the observed water quality is the presence of elevated chloride and sodium in well TW-2A (on the order of 180 mg/L and 90 mg/L, respectively). The presence of these constituents at high levels in groundwater on the northern parcel suggests effects from deicing operations on Route 376.

3.2.3.1.1.3 Capacity

Based on the results of the aquifer testing performed on these two parcels, it is feasible to construct two production wells on either of them that would be individually capable of supplying the normal and peak demands of the SST. In fact, the aquifer test results suggest that higher yields would be sustainable from each of the wells tested in this evaluation. To determine the availability of groundwater resources to sustain this yield from the sand and gravel aquifer, an analysis was performed to determine the drainage area above the Route 376 Properties and the associated average annual recharge rate over that drainage area. Figure 3-5 shows the outline of the drainage area of Gayhead Creek above Gayhead Pond. This area is 13.16 square miles and based on an average annual recharge rate of 0.94 MGD per square mile, the average annual baseflow in Gayhead Creek at Gayhead Pond would be 12.39 MGD, or 19.21 cubic feet per second (cfs) (Bent, 1998). This is more than sufficient to sustain withdrawals from this aquifer equal to the normal and peak demands of the service territory.

3.2.3.1.1.4 Potential Sources of Contamination

The EDR and NYSDEC records indicate two significant spills within one mile of the Route 376 property. These are the Mobil Service Station located less than 0.25 miles southeast of the Route 376 Property boundary and a residential fuel oil spill that occurred roughly 1 mile west of the Route 376 Properties (Figure 3-4). The latter of these two is too far from the Route 376 Properties to be a concern. No recent spills were identified during the March 17, 2003, NYSDEC file review.

The Mobil Service Station is located on the southwest corner of the Route 52, Blue Hill Road intersection. The station is surrounded by a mix of residential and commercial properties. Information on this site is included in Appendix C, and the discussion of aquifer tests in Section 2.2.1.3 demonstrates that this contamination will not threaten groundwater supplies that may be developed under Alternative 3.

Dolostone bedrock outcrops directly behind the garage on the southern segment of the parcel. Drilling records indicate bedrock is within 3 to 7 feet of ground surface throughout the remainder of the site. The contaminant plume indicates that groundwater flow is to the northwest. The gas station sits approximately 500 feet south of the Sprout Creek-Fishkill Creek aquifer and approximately 1500 feet south of well location TW-4AD.

Investigation of groundwater contamination at the site began in June, 1996 under NYSDEC's spills program after groundwater samples from the Mobil Station supply well indicated a spill had occurred. Water supply wells within 0.5 miles of the station were tested for MTBE and BTEX compounds. Initial testing revealed toluene and MTBE were detected above the drinking water standard in three wells, which were supplied with carbon filter systems in July, 1996. An additional well was fitted with a carbon system in 1998. Four of the wells that are currently tested are not equipped with carbon systems. Data from December, 2002, indicates an additional residence may receive a treatment system. (No subsequent report has been produced for this site.) The eight drinking water wells are currently sampled on a monthly basis. Gasoline tanks were replaced in April, 2000, and an unknown volume of contaminated soil was removed from the site.

Three onsite monitoring wells were installed in 1996 to monitor contamination. Intermittent sampling of these wells revealed total BTEX compounds at a maximum concentration of 204 ug/l, and MTBE concentrations as high as 459 ug/l. Both of these concentrations were from the same well, which was adjacent to the former USTs. The three initial monitoring wells were abandoned in March, 2001 and March, 2002. Five monitoring wells were installed in 2001, and have been monitored on a quarterly basis since September, 2001. The BTEX compound historical maximum of 1,466 ug/l was established in September, 2001, at a monitoring well located on the northern edge of the property near Route 52. The highest concentration of MTBE in the new monitoring wells, 339 ug/l in September, 2001, was detected adjacent to the USTs. The historical maximum of MTBE in onsite wells occurred in the water supply well. A January, 1999, sample contained 3,360 ug/l. Concentrations of MTBE in the water supply well have been below 10 ug/l since February, 2001.

Monitoring has continued in private wells adjacent to the gasoline station. BTEX compounds have typically not been detected in these wells. Data from mid-1997 through the end of 2002 show increasing trends of MTBE contamination. An off site maximum of 515 ug/l was recorded in September, 2002 on a property north of the gas station. Documents relevant to this site can be found in Appendix C3.

As discussed in Section 2, monitoring well 6 at this service station and two of the contaminated supply wells were monitored during a long-term test at well TW-4AD. Based on the analysis of that test data, as presented in Section 2, the plume of MTBE from this service station appears to be flowing in the direction of a wetland to the northwest of the service station. Furthermore, the operation of well TW-4AD did not alter this direction of groundwater flow.

NYSDEC is currently investigating a fuel oil spill on Old State Road in Hopewell Junction, NY, that may be the source of contamination on nearby Schlueter Road (see Appendix C3). This location is 0.8 miles from the closest property boundary of the Route 376 properties. The spill occurred between April and July, 1999, and may have originated when residential oil lines were damaged during construction in the house. NYSDEC estimated that approximately 1,500 gallons of fuel oil was spilled. Investigation of soils beneath the residence indicated extensive fuel oil contamination, resulting in the

removal of approximately 32 tons of soil from beneath the house. A small amount of impacted soil could not be removed because it was beneath the building footer. In June, 2000, three monitoring wells were installed at the site to evaluate the extent of contamination at the site. Drilling notes indicate unconsolidated material at the site is approximately 10 feet thick, and is not perennially saturated. Bedrock consists of highly fractured, homogenous dolostone of the Wappinger Group. The three wells were completed to a depth of 103 feet below grade. Sampling shortly after well completion did not reveal the presence of contaminants associated with fuel oil. One location, however, did show 11 ug/l of MTBE. Sampling in September, 2002, revealed contaminants associated with fuel oil were present at levels below 10 ug/l. MTBE was also detected at one sampling location at 21 ug/l. The former water supply well at the property is currently used as a fuel oil recovery well.

In February, 2000, NYSDEC began an investigation into possible MTBE contamination on Schlueter Road, northeast of the State Road spill. The initial round of sampling revealed seven residential wells contained MTBE. Five of these wells contained concentrations over 10 ug/l, with a maximum value of 24 ug/l. Benzene, xylene, sec-butylbenzene, n-butylbenzene, 4-isopropyltoluene, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, and naphthalene were also detected in at least one well. The highest concentrations among these compounds were 11.6 and 8.8 ug/l of total xylene, and 12 and 5.4 ug/l of naphthalene. All other detections were below 5 ug/l. After a confirmation sampling round, four carbon treatment systems were installed. Data available through August, 2002, shows decreasing trends for all parameters detected in the initial sampling round. MTBE is the only parameter detected after the fourth quarter of 2000, and levels of this contaminant have dropped below 5 ug/l in raw water samples at the three remaining carbon systems.

NYSDEC has concluded that the fuel oil spill on Old State Road is responsible for the contamination found on Schlueter Road. Although MTBE is not a component of fuel oil, the supply vehicles may haul gasoline and fuel oil in the same tank. It is possible for MTBE to become a trace constituent in fuel oil. Tests on fuel oil taken from an on-site recovery well have not been able to verify or eliminate this possibility.

During the March 14, 2003 interview, the NYSDEC Regional Spills Personnel indicated there had recently been a detection of 55 to 60 ug/l of MTBE in a homeowner well along Schlueter Road. This residence is southeast of the homes previously affected by the fuel oil spill, near the end of the road. It is unclear if this detection of MTBE is related to the State Road spill or if it represents a new release.

3.2.3.1.1.5 Floodplain and Wetlands Permitting Requirements

A portion of the access road and pipeline required to develop supplies from Alternative 3 would be within the 100-foot adjacent area to NYSDEC wetland HJ-53 (as shown in Figure 2-1), and is under the jurisdiction of NYSDEC. The proposed location for the access road and pipeline required to implement Alternative 4 is under the jurisdiction of both USACE and the Town of East Fishkill, because it is located within federally regulated wetlands and is within the 100-year floodplain for Gayhead Creek. Construction in this area would require a permit from USACE, and a permit from the Town of East Fishkill. The permitting requirements for both sites, and the estimated associated timeframes are outlined below.

Town of East Fishkill

As shown on Figure 3-4, the well field for Alternative 4 is located within the floodplain of Gayhead Creek. To establish supply wells on this site would require a floodplain permit from the Town of East Fishkill, which has adopted the state floodplain management requirements. The permit would require the well heads to be two feet higher than the Base Flood Elevation (BFE) for the site.

According to the Town of East Fishkill Building and Zoning Department and Town Engineer, there is no data available on the BFE for the Route 376 Properties. To obtain a permit from the town, a flood plain study would be required to determine the BFE. The results of the study and the site plans would need to be submitted to the Building and Zoning Department or the Planning Department to acquire a flood plain permit. The Town would not offer an estimate of the time required for the review process.

It may be possible to avoid the flood plain permit requirement if Alternative 3 is implemented and the well field can be installed near TW-4AD in the upland area on the gravel pit outside of the Gayhead

Creek floodplain. This option would avoid federally regulated wetlands and the flood plain, and would require only a permit from NYSDEC to construct the access road and underground pipeline, a portion of which would be within the adjacent area of wetland HJ-53.

New York State Department of Environmental Conservation (State Permit)

The construction of the access road and pipeline within the adjacent area to HJ-53 will be classified as a major project (road construction within the regulated area). The agency's schedule for review of a major project permit application allows for 15 calendar days from the receipt of the application, for the NYSDEC to determine if the application is complete. If complete, the agency has up to 90 days to perform their review or 60 days after the last public hearing if a hearing is required. Based on discussions with NYSDEC, every effort will be made by the department to expedite the issuance of this permit.

United States Army Corps of Engineers (Federal Permit)

If Alternative 4 is implemented, the well field, access road and transmission piping from the well field to Route 376 would all be within federally regulated wetlands. If the project can be completed with less than one-half acre of permanent wetland disturbance, it would qualify for USACE Nationwide Permit (NWP) #12, Utility Line Activity. If the wetland loss from the proposed activity will exceed 0.5 acres, the action will require an Individual Permit from the United States Army Corps of Engineers (USACE). Including the time necessary to prepare and submit the permit application, initial review, public comment and final action by USACE, this entire process could take six months to a year, without consideration of intervention by interested parties. The low end of this range assumes intercession by EPA to accelerate the permitting process.

Should the use of NWP #12 be acceptable to USACE for the proposed project, their response is required within 45 days of their receipt of the notification. If an official response is not received within 45 days, the applicant may assume that the project can move forward. Reviews can and have taken longer than

the noted 45 days. Even if the review period is exceeded by the agency, it is prudent to wait for USACE concurrence.

If the proposed disturbance is greater than the minimum threshold of 0.10 acres, the USACE may require mitigation for all losses associated with the project construction. In addition, concern over withdrawal of water from the aquifer below the surface water wetlands may be an issue although it is not likely to have an impact on the granting of the permit. NWP Condition #26 requires that the project conform to all FEMA approved management requirements at both the state and local level (discussed above).

3.2.3.1.2 Treatment

Treatment for Alternative 3 would consist of manganese sequestration followed by chlorination (disinfection) and chlorine contact detention. Due to the presence of manganese at low levels (0.7-0.8 mg/l), but in excess of the drinking water standard of 0.3 mg/l, sequestration would be the likely treatment alternative over oxidation and filtration. Sequestration is the ability to form a complex bond with metal ions that allow the metal ions to remain in solution despite the presence of precipitation agents, such as chlorine. Sequestration is generally used when the combined iron and manganese levels are below 1.0 mg/l.

Treatment for Alternative 4 would consist of chlorination (disinfection) and chlorine contact detention.

3.2.3.2 Transmission Piping

3.2.3.2.1 Alternative 3

This route begins along Old State Road approximately 1000 feet from its intersection with Route 52. It involves the installation of a main transmission line via Old Stage Road southeasterly to NYS Route 52. From this point the transmission line would cross under Route 52 and follow easterly a distance of 600 feet to the intersection of Route 52 and Blue Hill Road. The route continues southerly along Blue Hill Road to the intersection with Shenandoah Road. The route continues southeasterly along Shenandoah Road to the northerly terminus of the Site. The total length of this route is approximately 12,000 feet, of which approximately 600 feet is situated in State and County road rights-of-way.

Starting elevation of the route is 270+/- and ending elevation is 361 +/-(difference = 91 ft or 40 psi static).

This route requires three minor stream crossings and one NYSDOT highway crossing.

3.2.3.2.2 Alternative 4

This route begins along Route 376, at a point approximately 5200 feet north of the intersection of Route 376 and NYS Route 52. It involves the installation of a main transmission line southerly to NYS Route 52. From this point the transmission line would cross under Route 52 and follow easterly a distance of 600 feet to the intersection of Route 52 and Blue Hill Road. The route continues southerly along Blue Hill Road to the intersection with Shenandoah Road. The route continues southeasterly along Shenandoah Road to the northerly terminus of the Site. The total length of this route is approximately 15,500 feet, of which approximately 5600 feet is situated in State and County road rights-of-way.

Starting elevation of the route is 254+/- and ending elevation is 361 +/-(difference = 107 ft or 46 psi static).

This route requires three minor stream crossings and one NYSDOT highway crossing.

4 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TBCS

4.1 Applicable or Relevant and Appropriate Requirements (ARARs)

Applicable requirements are defined as those promulgated Federal or state requirements (e.g., cleanup standards, standards of control) that specifically address the situation at a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site. Relevant and appropriate requirements are those promulgated Federal or state requirements that, while not applicable, address problems sufficiently similar to those encountered at CERCLA sites that their application is appropriate. The New York State Department of Environmental Conservation (NYSDEC) defines applicable requirements as all Standards, Guidance and Criteria (SCGs) relevant to the site remedial alternatives.

In addition to ARARs and Standards, Criteria and Guidance (SCGs), other Federal, state, and local criteria, advisories, or guidances may also apply to the conditions found at the site; these are referred to as to-be-considered (TBC) items. TBCs are not legally binding, but may be useful within the context of assessing alternatives and carrying out cleanups.

ARARs are generally divided into three categories: chemical-specific, location-specific, and action-specific. Chemical-specific ARARs govern acceptable or permissible contaminant concentrations in soil, air, and water. Location-specific ARARs govern activities in specific geographic areas such as floodplains, wetlands, endangered species habitats, or historically significant areas. Action-specific ARARs are technology- or activity-based requirements.

4.1.1 Chemical-Specific ARARs, SCGs and TBCs

4.1.1.1 ARARs and SCGs

Chemical-specific ARARs and SCGs for the Alternate Water Supply Response Action (AWSRA) at the Shenandoah Site are discussed below. Constituents of Concern (COCs) include all Primary and Secondary Maximum Contaminant Levels (MCLs and SMCLs).

Great Lakes Upper Mississippi River Board Standards for Water Works (Ten States Standards), 10 NYCRR Part 5 of the New York State Sanitary Code - Drinking Water Supplies (Subpart 5-1), and 10 NYCRR 170 of the New York State Sanitary Code (Sources of Water Supply) are the recommendations for the construction and development of a water supply distribution system. The public water system recommendations include minimum treatment for groundwater supplies by disinfection (e.g., chlorination or ultraviolet [UV] light), distribution system requirements such as maintenance of a minimum pressure of 20 pounds per square inch (psi) and cross-connection control requirements, and water quality monitoring and record-keeping requirements based on the size of the system. The Ten State Standards specify well construction, treatment, pumping, storage and distribution system requirements, including the provision of a minimum of two sources of groundwater supply (e.g., two separate production wells) and redundant treatment capacity (e.g., two treatment units each capable of handling the maximum demand flow). In addition to these standards, local authorities, including the Dutchess County Health Department (DCHD) and the Town of East Fishkill may have specific requirements for the design of public water supply systems (e.g., minimum water main sizes, provision of fire protection) that must be met prior to the approval of a system. 10 NYCRR Part 170 deals specifically with protection of public water supplies.

U.S. Environmental Protection Agency (EPA) Drinking Water Standards include the Safe Drinking Water Act (SDWA) and the National Primary Drinking Water Standards (40 CFR Part 141) for the regulation of contaminants in all surface water or groundwater utilized as potable water supplies. The primary standards include both MCLs and Maximum Contaminant Level Goals (MCLGs). MCLs are enforceable standards for specific contaminants based on human health factors as well as the technical and economic feasibility of removing the contaminants from the water supply. MCLGs are non-enforceable standards that do not consider the feasibility of contaminant removal. The SDWA also includes secondary MCLs (40 CFR Part 143) that are non-enforceable guidelines for those contaminants that may adversely affect the aesthetic quality of drinking water, such as taste, odor, color, and appearance. The constituents covered by the SDWA are also addressed in the New York State Groundwater Standards (see below). This section of the federal code also regulates water supply systems.

New York State Groundwater Standards (6 NYCRR Parts 700-706) have been promulgated by NYSDEC and are legally enforceable. The aquifer underlying the site has been designated a Class GA groundwater, which is defined as: "The best usage of Class GA waters is as source of potable water supply. Class GA waters are fresh groundwaters found in the saturated zone of unconsolidated deposits and consolidated rock or bedrock." Therefore, the Class GA groundwater standards (6NYCRR, Part 703) are intended to protect human health through the use of the groundwater as a drinking water supply and are equivalent to the MCLs established by NYSDOH for public drinking water supplies. The New York State MCLs were promulgated in the New York Code of Rules and Regulations (NYCRR) Title 10 Chapter I (State Sanitary Code) Part 5, Subpart 5-1, Public Water Supplies.

New York State Surface Water Standards (6 NYCRR Parts 700-706) have been promulgated by NYSDEC for the protection of human health and/or aquatic life are legally enforceable. The surface water standards are dependent on the state assigned classification of the surface water body as well as the carbonate hardness of the surface water for inorganic constituents.

U.S. Environmental Protection Agency (EPA) Ambient Water Quality Criteria were developed under Section 304(a)(1) of the Clean Water Act (CWA). The criteria are based on data and scientific judgements on the relationship between the concentration of a contaminant and environmental and human health effects. These water quality criteria are not legally binding but should be achieved for any discharge into surface waters.

4.1.1.2 TBCs

EPA Drinking Water Health Advisories are non–enforceable guidelines developed by EPA for chemicals that may be encountered in drinking water. EPA has prepared short-term (1- to 10-day) and long-term (several years to lifetime) health advisories for subchronic and chronic effects of contaminants. A drinking water equivalent level (DWEL) is calculated as a lifetime health advisory based on a 2-liter/day water consumption for a 70-kg adult. The DWEL is the most appropriate guideline for evaluation of contaminant levels in a potable water supply.

New York State Water Guidance Values are provided in the Division of Water Technical and Operational Guidance Series (TOGS 1.1.1), which describes ambient water quality standards, guidance values, and groundwater effluent limitations. A guidance value is used when a standard has not yet been established for a particular water class.

4.1.2 Location-Specific ARARs and TBCs

4.1.2.1 ARARs

Location-specific ARARs govern activities in specific geographic areas such as wetlands, endangered species habitats, and historic locations.

The National Historic Preservation Act (NHPA) must be complied with when any activities that are licensed by the Federal Government will have an effect on properties that are listed in the National Register of Historic Places, or ones that are eligible for such a listing. Therefore, any water supply development would need to be evaluated as to its impact on these potential resources.

U.S. Environmental Protection Agency (EPA) Section 404 of Clean Water Act establishes a program to regulate the discharge of dredged and fill material into navigable waterways of the United States, including wetlands. Activities in waters of the United States that are regulated under this program include fills for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and conversion of wetlands to uplands for farming and forestry.

U.S. Army Corps of Engineers (ACE) Section 401 of the Clean Water Act (33 U.S.C. 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into waters of the United States to obtain a certification from the State in which the discharge originates or would originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over the affected waters at the point where the discharge originates or would originate, that the discharge will comply with the applicable effluent limitations and water quality standards. A certification obtained for the construction of any facility must also pertain to the subsequent operation of the facility.

6 NYCRR Part 663 states that wetlands include lands and waters of the state that have an area of 12.4 acres or more, or have a smaller area but are determined by the commissioner to have unusual local importance. This regulation acts to preserve, protect, conserve, and regulate the use and development of freshwater wetlands to secure the natural benefits that are consistent with the general welfare and beneficial economic, social, and agricultural development. Any remediation activity that would disturb a wetland area, such as pipe installation, would have to be conducted in accordance with this regulation.

4.1.2.2 TBCs

Executive Order 11988 - Floodplain Management reduces the risk of flood loss, minimizes the impact of floods on human safety, health, and welfare, and restores and preserves the natural and beneficial values served by floodplains. The Order requires that a determination must be made if any action will occur in a floodplain and, if so, alternatives must be considered to avoid the adverse effects and incompatibility of development in the floodplain.

Executive Order 11990 - Protection of Wetlands minimizes the destruction, loss, or degradation of wetlands and preserves and enhances the natural and beneficial values of wetlands. The Order states that new construction shall not degrade wetlands unless there is no practical alternative and the action includes all the practical measures to minimize harm to the wetlands. New construction includes draining, dredging, channelizing, filling, diking, impounding, and related activities.

EPA Policy on Floodplains and Wetland Assessments for CERCLA Actions states that Superfund actions must meet the requirements of Executive Order 11988 and 11990 and Appendix A of 40 CFR Part 6 of the National Environmental Policy Act (NEPA); Appendix A is entitled Statement of Procedures on Floodplain Management and Wetland Protection. The purpose of Appendix A is to set forth Agency policy and guidance for carrying out the provisions of Executive Orders 11988 and 11990. The Orders should be implemented through existing procedures such as preparation of an Environmental Impact Statement (EIS) pursuant to section 102(2)C of NEPA, or where the action is not subject to NEPA, alternative but equivalent evaluations and public comment and notice procedures must be established. EPA removal and remedial actions are not subject to NEPA but the Wetland/Floodplain assessment must be done.

The Endangered Species Act (16 UST 1531 et seq.) and the Endangered and Threatened Species of Fish and Wildlife; Species of Special Concern (6 NYCRR Part 182) would have to be complied with if any endangered species were found. No threatened or endangered species or habitats were observed or are expected to be present within the area of study, and a determination by NYSDEC Region 3 based on a review of the Significant Habitat and Natural Heritage Program files for the site is being initiated. The absence of records does not necessarily mean that endangered or threatened species do not exist on or adjacent to the site.

The Preservation of Historical and Archeological Data Act of 1974 (16 UST 469 et seq.) mandates that whenever a Federal construction project or activity alters any terrain such that significant historical or archeological data are threatened, the Secretary of the Interior may take action to recover and preserve these data prior to the commencement of the project.

4.1.3 Action-Specific ARARs and TBCs

4.1.3.1 ARARs

TOWN LAW-ARTICLE 12 or 12A and NYS Title 2, Part 85 sets forth both the legal requirements and administrative procedures for approval of Town special districts, sewer and water improvements. These requirements would apply in the instance where a Town water district is to be established as the legal entity owning and operating the water system.

6 NYCRR Part 601 explains the requirements of developing a water distribution system for potable purposes. These requirements include applying for a permit from the NYSDEC to install a new water supply system, take lands for any new sources of water supply, commence the construction of any works or projects in connection with proposed plans for a water supply system, and conduct other water supply system activities. If a new water supply system is selected, a permit will need to be obtained to satisfy this regulation prior to construction.

6 NYCRR PART 617, STATE ENVIRONMENTAL QUALITY REVIEW Statutory authority: Environmental Conservation Law, Sections 3-0301(1)(b), 3-0301(2)(m) and 8-0113, applicable to all

state and local agencies within New York State, including all political subdivisions, districts, departments, authorities, boards, commissions and public benefit corporations.

TRANSPORTATION CORPORATIONS LAW, Section Three, §116 & §117 sets forth the requirements of a privately owned water works or sewage works in New York State.

4.1.3.2 TBCs

EPA Guidance Document for Providing Alternate Water Supplies (EPA/540/G-87/006) provides guidance for sites that do not require a time-critical removal action, but do require an alternate water supply. The ability to implement alternative water supplies as non-time-critical removal actions depends on the site conditions and available resources. The conditions at the site are non-time-critical because action is not required within six months.

Town of East Fishkill Highway Specifications sets forth the requirements for work in a Town road, including utility installation and surface restoration.

New York State Department of Transportation Highway Specifications sets forth the requirements for work in a State Highway, including utility installation and surface restoration.

Dutchess County Department of Transportation Highway Specifications sets forth the requirements for work in a County Highway, including utility installation and surface restoration.

New York State Department of Environmental Conservation (NYSDEC) Titles 7, 8 and Articles 70 of the ECL, January 8, 2003 sets forth requirements for stormwater management and treatment relating to construction activities (SPDES General Permit GP-02-01).

5 DETAILED ANALYSIS OF ALTERNATIVES

This section presents the detailed evaluation of the water supply alternatives described in Section 3. The purpose of this section is to identify the advantages and disadvantages of each alternative. The criteria used to evaluate the alternatives are specified in the Alternative Water Supply Response Action Work Plan dated December 13, 2001, as approved by USEPA, and are as follows.

- **Overall Protection of Human Health and the Environment**

This criterion evaluates the extent to which the alternative will achieve and maintain protection of human health and the environment and how the protection will be achieved.

- **Compliance with ARARs**

This criterion evaluates the compliance of the alternatives with all identified ARARs.

A comprehensive listing of ARARs and TBCs has been provided in Section 4.

- **Long-Term Effectiveness**

Each alternative is evaluated for its long term effectiveness in protecting human health and the environment.

- **Reduction of Toxicity, Mobility and Volume**

This criterion evaluates the degree by which each alternative results in a reduction of toxicity, mobility and volume. Because this is not a cleanup action, evaluation by this criteria will not be significant to the selection of the alternative.

- **Short-Term Effectiveness**

This alternative evaluates the impacts of each alternative on human health and the environment during the construction and implementation phase.

- **Implementability**

The criteria deals with the technical and administrative feasibility of implementing each alternative, including: constructability, reliability, expand ability, and approvals.

  - **Community and State Acceptance**

    Community and state acceptance are also to be considered in evaluating the water supply alternatives. Community acceptance cannot be assessed until public comments have been received. State acceptance of the proposed plan will be addressed by the state agencies and EPA.

  - **Administrative Feasibility**

    This criteria was added as a result of a July, 2003 meeting with representatives of EPA and NYSDEC. It will address the approvals required for securing a water purchase agreement for the applicable alternatives, and the status thereof.

- **Cost**

The relative capital costs have been estimated for each alternative. Operations and maintenance (O&M) costs for each alternative are also included based on a 30 year life (EPA 1988c). The cost estimates included in this report are for comparison purposes. The cost per 1000 gallons of water used is also presented based on the anticipated total use of 33,000 gpd, along with the total present worth based on a 30 year life. A detailed evaluation of capital costs, O & M costs, and present worth is presented in Section 6 of this report.

5.1 Alternative 1: Town of Fishkill

As described in Section 3, this alternative involves the purchase of water from the Town of Fishkill under a 40-year agreement among three parties, the Town of Fishkill, the Town of East Fishkill and IBM. This agreement requires IBM to assign its rights to an allocation of 80,000 gpd to the Town of East Fishkill, to construct all capital facilities and to convey ownership of them to each town as appropriate.

5.1.1 Protection of Human Health and the Environment

This alternative provides for the protection of human health and the environment through the supply of a reliable and uncontaminated source of potable water to the Shenandoah Road Superfund Site. No significant potential sources of contamination have been identified as threatening the water quality of the Snook Road Well Field.

5.1.2 Compliance with ARARs and TBCs

Applicable drinking water standards will be achieved. Pipeline installation will comply with specific ARARs and TBCs. Applicable permits and approval will be obtained prior to construction. Federal and state system requirements will be achieved.

5.1.3 Long-Term Effectiveness

This alternative would be effective in providing a long-term, reliable source of potable water. The water supply exhibits moderate hardness and chloride concentrations. The supply would be guaranteed by contract between the Towns of Fishkill and East Fishkill, suggesting homeowner softening may be desirable. The Town of Fishkill has a long history of water supply and distribution service.

5.1.4 Reduction of Toxicity, Mobility and Volume

This alternative reduces the potential for toxicity to humans by providing a long-term alternative to the current highly effective POET systems in supplying clean, potable water to the SST.

5.1.5 Short-Term Effectiveness

This alternative has an estimated time of completion of construction of twenty-six (26) months. This alternative requires extensive work in the boundaries of NYS Route 52 which may lead to significant, short-term traffic safety and delay issues. There is one major creek crossing and three minor creek crossings associated with this route.

5.1.6 Implementability

5.1.6.1 Constructability

This alternative is constructable. It requires the installation of 20,000 +/- feet of pipeline, a booster station, meter pit and numerous incidentals. There is a significant amount of work required in the N.Y.S. Route 52 right-of-way.

5.1.6.2 Reliability

This alternative is deemed highly reliable due to the pending inter-municipal involvement and guarantee of water delivery by the Towns of Fishkill and East Fishkill.

5.1.6.3 Approvals

This alternative requires the design and approval of a water distribution and storage system and the establishment of a Town Water District in the Town of East Fishkill. Regulatory approval of source and sale of water is being handled by the Town of Fishkill and is in process. Construction permits will also be necessary in the Town of Fishkill and East Fishkill.

5.1.6.4 Expandability

The proposed distribution system is expandable. The proposed water purchase agreement currently sets aside 80,000 gallons per day on an average daily use basis, which would allow for small to moderate expansion along the proposed route and adjacent to the proposed water service area at Shenandoah. Also, the Town of Fishkill has additional excess capacity that may be available for delivery through the same transmission piping to be constructed under this option.

5.1.6.5 Administrative Feasibility

A three-party agreement is required between the Town of Fishkill, Town of East Fishkill and IBM Corporation for allocation of water supply for this project. This contract was approved by the Town of Fishkill Board on November 5, 2003 and it is scheduled to go before the Town of East Fishkill Board for approval on November 13, 2003.

5.1.7 Costs

1)	Source & Transmission to SST (from Table 6.02(a))	$ 4,160,120.00
2)	Water District (from Table 6.02)	$ 4,632,845.00
	Total Capital Cost	$ 8,792,965.00
	30 Years Present Worth - O&M	$ 1,187,701.00
	Total Present Worth	$ 9,980,666.00
	Cost of Water per 1000 Gallons	$ 5.70
	Total Annual O&M	$ 68,685.00

5.2 Alternative 2: Dutchess County Pipeline

The Dutchess County Pipeline alternative involves the purchase of water from the Town and City of Poughkeepsie that will be transmitted through a thirteen mile pipeline from Poughkeepsie to the front gate of the IBM East Fishkill Plant Site. The water to be supplied to Shenandoah will be part of an initial two million gallon allocation to IBM from this pipeline. This allocation and IBM's participation in the construction of the pipeline are covered by a binding memorandum of understanding that will be replaced by a contract among the parties. This contract is currently under negotiation. Design had been completed for the pipeline and permit applications have been submitted for its construction.

5.2.1 Protection of Human Health and the Environment

This alternative provides for the protection of human health and the environment through the supply of a reliable and uncontaminated source of potable water to the Shenandoah Road Superfund Site.

5.2.2 Compliance with ARARs

Applicable drinking water standards achieved. Pipeline installation will comply with locally specific ARARs. Applicable permits and approval will be obtained prior to construction. State and federal system requirements will be achieved.

5.2.3 Long-Term Effectiveness

This alternative will be effective in providing a long-term, reliable source of potable water, given multi-governmental ownership of the source and transmission piping. This includes the City of Poughkeepsie, Town of Poughkeepsie, and the Dutchess County Water Authority (pipeline only). The water source upgrade is currently being constructed to: expand capacity, improve filtration efficiency and eliminate trihalomethanes (THMs). The City of Poughkeepsie and Town of Poughkeepsie have a long history of water supply and distribution service.

5.2.4 Reduction of Toxicity, Mobility and Volume

This alternative reduces the potential for toxicity to humans by providing a long-term alternative to the current, highly effective POET systems in supplying clean, potable water to the SST.

5.2.5 Short-Term Effectiveness

This alternative has an estimated time of completion of twenty-four (24) months from decision. This alternative requires some work in the boundaries of N.Y.S. Route 52 which may lead to moderate, short-term traffic safety and delay issues. There are three minor creek crossings associated with this route.

5.2.6 Implementability

5.2.6.1 Constructability

This alternative is highly constructable. It requires the installation of 13,000 +/- feet of pipeline, a booster station, meter pit and numerous incidentals. There is a moderate amount of work required in the N.Y.S. Route 52 right-of-way.

5.2.6.2 Reliability

This alternative is deemed highly reliable due to the multiple municipal ownership of the sources, including viable surface and groundwater supplies, and the involvement of the Dutchess County Water

and Wastewater Authority in the design and construction of the proposed pipeline and related improvements from the Town of Poughkeepsie to East Fishkill.

5.2.6.3 Approvals

This alternative requires the design and approval of a water distribution and storage system and the establishment of a Town Water District or Private Water Company in the Town of East Fishkill. Regulatory approval of Dutchess County pipeline is being handled by the Dutchess County Water and Wastewater Authority.

The September 1, 2003 edition of Engineering News Record included a project announcement by the Dutchess County Water and Wastewater Authority of the Central Dutchess Water Transmission Line Project. The announcement included an anticipated bid for the construction of the project in late September/Early October of 2003, depending upon receipt of required permits.

5.2.6.4 Expandability

The proposed distribution system is expandable. The source is plentiful and would allow for moderate to large expansion along the proposed route and adjacent to the proposed water service area at Shenandoah.

5.2.6.5 Administrative Feasibility

A memorandum of understanding was entered into on May 6, 2002 by and between the following parties: Dutchess County Water & Wastewater Authority, City of Poughkeepsie, Town of Poughkeepsie, Poughkeepsie Joint Water Board, and IBM Corporation. Negotiations are currently proceeding with respect to a final agreement. Detailed plans and specifications have been prepared and submitted to appropriate agencies for review and approval and permits have been received.

5.2.7 Costs

1)	Source & Transmission to SST (from Table 6.02(b))	$ 2,474,235.00
2)	Water District (from Table 6.02)	$ 4,632,845.00
	Total Capital Cost	$ 7,107,080.00
	30 Years Present Worth - O&M	$ 1,227,282.00
	Total Present Worth	$ 8,334,362.00
	Cost of Water per 1000 Gallons	$ 5.90
	Total Annual O&M	$ 70, 974.00

5.3 Alternative 3: Route 376 Properties - Parcel A

This alternative involves the development of a two-well well field on the southernmost parcel of the Route 376 Properties. Testing indicates that each of two production wells to be drilled if this alternative is selected will readily produce sufficient yield to supply the needs of the SST. IBM holds an option to purchase this property at such time as this option would be selected.

5.3.1 Protection of Human Health and the Environment

This alternative provides for the protection of human health and the environment through the supply of a reliable and uncontaminated source of potable water to the Shenandoah Road Superfund Site.

5.3.2 Compliance with ARARs

Applicable drinking water standards would be achieved after treatment for manganese. Pipeline installation will comply with locally specific ARARs. Applicable permits and approval will be obtained prior to construction. Development of this source will increase approval requirements. Attainment of the secondary MCL for manganese will require the use of sequestration to prevent its precipitation. State and federal system requirements will be achieved.

5.3.3 Long-Term Effectiveness

This source would be effective in providing a long-term, reliable source of potable water. The water supply has high hardness concentrations and will require treatment for manganese. There is therefore

a high likelihood of frequent on-going well redevelopment costs and homeowner softening will be desirable.

5.3.4 Reduction of Toxicity, Mobility and Volume

This alternative reduces the potential for toxicity to humans by providing a long-term alternative to the current, highly effective POET systems in supplying clean, potable water to the SST.

5.3.5 Short-Term Effectiveness

This alternative has an estimated time of completion of twenty-eight (28) months from decision. There are three minor creek crossings associated with this route, along with minor work in the boundaries of N.Y.S. Route 52. This alternative includes additional source design and approvals. Wetlands permitting issues will be involved at the source, as described in Section 3.

5.3.6 Implementability

5.3.6.1 Constructability

This alternative is deemed constructable. It requires the installation of 12,000 +/- feet of pipeline including incidentals, and significant source improvements, including: well field, chlorination and pump house, contact tank and manganese treatment. There is a moderate amount of work required in the N.Y.S. Route 52 right-of-way.

5.3.6.2 Reliability

This alternative is deemed reliable due to the anticipated municipal ownership of the sources and distribution improvements. It is also possible, should the Town of East Fishkill opt to not establish a Water District, that ownership and operation would be passed to a reputable private water company.

5.3.6.3 Approvals

This alternative requires the design and approval of a water distribution and storage system and the establishment of a Town Water District or Private Water Company in the Town of East Fishkill. There

would be additional approval requirements associated with development and permitting of a new source of public water supply. Furthermore, wetlands permitting would be required for the portion of the transmission piping that would pass through the buffer zone of a New York State mapped wetland.

5.3.6.4 Expandability

The proposed distribution system is expandable. The source is plentiful and would allow for moderate expansion along the proposed route and adjacent to the proposed water service area at Shenandoah.

5.3.6.5 Administrative Feasibility

An option agreement currently exists for the acquisition of the water supply Parcel A by IBM Corporation.

5.3.7 Costs

1)	Source & Transmission to SST (from Table 6.02(c))	$ 3,714,345.00
2)	Water District (from Table 6.02)	$ 4,632,845.00
	Total Capital Cost	$ 8,347,190.00
	30 Years Present Worth - O&M	$ 1,417,944.00
	Total Present Worth	$ 9,765,134.00
	Cost of Water per 1000 Gallons	$ 6.80
	Total Annual O&M	$ 82,000.00

5.4 Alternative 4: Route 376 Properties - Parcel B

This alternative involves the development of a two-well well field on the northernmost parcel of the Route 376 Properties. Testing indicates that each of two production wells to be drilled if this alternative is selected will readily produce sufficient yield to supply the needs of the SST. IBM holds an option to purchase this property at such time as this option would be selected.

5.4.1 Protection of Human Health and the Environment

This alternative provides for the protection of human health and the environment through the supply of a reliable and uncontaminated source of potable water to the Shenandoah Road Superfund Site.

5.4.2 Compliance with ARARs

Applicable drinking water standards will be achieved. Pipeline installation will comply with locally specific ARARs. Applicable permits and approvals will be obtained prior to construction. Development of source will increase approval requirements. Both federal wetlands and local floodplain permits will be required. State and federal system requirements will be achieved.

5.4.3 Long-Term Effectiveness

Effective in providing a long-term, reliable source of potable water. Water supply has high hardness concentrations and high chloride and sodium concentrations. There is a high likelihood of on-going well redevelopment costs. Homeowner softening will be desirable.

5.4.4 Reduction of Toxicity, Mobility and Volume

This alternative reduces the potential for toxicity to humans by providing a long-term alternative to the current, highly effective POET systems in supplying clean, potable water to the SST.

5.4.5 Short-Term Effectiveness

This alternative has an estimated time of completion of twenty-eight (28) months from decision. There are three minor creek crossings associated with this route, along with minor work in the boundaries of N.Y.S. Route 52 and extensive work along Route 376. This alternative includes additional source design and approvals. Wetlands and floodplain permitting issues will be involved at the source.

5.4.6 Implementability

5.4.6.1 Constructability

This alternative is deemed constructable. It requires the installation of 15,500 +/- feet of pipeline including incidentals, and significant source improvements, including: well field, chlorination and pump house, and contact tank. There is a moderate amount of work required in the N.Y.S. Route 52 right-of-way and significant work along Route 376.

5.4.6.2 Reliability

This alternative is deemed reliable due to the anticipated municipal ownership of the sources and distribution improvements. It is also possible, should the Town of East Fishkill opt to not establish a Water District, that ownership and operation would be passed to a reputable private water company.

5.4.6.3 Approvals

This alternative requires the design and approval of a water distribution and storage system and the establishment of a Town Water District or Private Water Company in the Town of East Fishkill. There would be additional approval requirements associated with development and permitting of a new source of public water supply, and wetlands and floodplain permitting.

5.4.6.4 Expandability

The proposed distribution system is expandable. The source is plentiful and would allow for moderate expansion along the proposed route and adjacent to the proposed water service area at Shenandoah, provided that the increased extraction of groundwater would not adversely affect the surrounding wetlands.

5.4.6.5 Administrative Feasibility

An option agreement currently exists for the acquisition of the water supply parcel by IBM Corporation.

5.4.7 Costs

1)	Source & Transmission to SST (from Table 6.02(d))	$ 3,982,700.00
2)	Water District (from Table 6.02(d))	$ 4,632,845.00
	Total Capital Cost	$ 8,615,945.00
	30 Years Present Worth -O&M	$ 1,314,192.00
	Total Present Worth	$ 9,929,737.00
	Cost of Water per 1000 Gallons	$ 6.30
	Total Annual O&M	$ 76,000.00

5.5 Private Water Company Versus Municipal Ownership and Operation

A private water works corporation can be formed to own and operate the system associated with Alternatives 2, 3, and 4 under the New York State Transportation Corporations Law. A certificate of incorporation will not be accepted for filing by the Secretary of State unless or until it is accompanied by a certificate of the town consenting to the formation of the corporation (reference: §116 and §117 of Transportation Corporations Law).

The continued provision of water service to the Shenandoah Road area can be accomplished through the establishment of:

1. a municipal Water District formed by the Town Board of the Town of East Fishkill, or,
2. a private water works corporation formed with the consent of the Town Board of the Town of East Fishkill.

Alternative 1 (Town of Fishkill supply) does not have a private water company option, as the Town Board of the Town of Fishkill has stipulated that they will not sell water to a private water company outside the Town boundaries.

The other alternative supplies (Dutchess County Pipeline, Route 376 wells-A, Route 376 wells-B) currently have a private water company option only if the Town Board of the Town of East Fishkill consents to same.

Given the specific circumstances of the Shenandoah Road water supply project, in that the selected alternative will be constructed under Superfund and will require no municipal bond issue, it is likely that the municipal Water District option would be selected by the Town Board. Under this scenario, ownership of the infrastructure and on-going operation and maintenance would pass to a water district governed by the Town of East Fishkill.

A municipal water district has several distinct advantages in terms of the cost to the consumer over a private water company, including:

1. tax exemption on real property owned by the district.
2. governance and establishment of rates by locally-elected officials directly accountable to the constituents.
3. availability of municipal bonding and access to government grants for future improvements.

It is projected that the Private Water Company alternative would have a higher annual operations and maintenance cost due primarily to three factors:

1. real property taxes
2. operating profit (rate of return)
3. special franchise tax on infrastructure assets in public thoroughfares

Discussions with representatives of private water companies in Ulster and Dutchess Counties indicated a general increase of 15-20% in operating expenses associated with the above-referenced factors. For the purposes of this evaluation, an increase of 17.5% is used to account for these factors, resulting in the following changes (Table 5.01) to the present worth analysis, which is presented in detail in Section 6 of this report:

Table 5.01
PRIVATE WATER COMPANY ALTERNATIVE
Estimate of Increase in O&M and Present Worth

Parameter	Alt # 2 Dutchess Pipeline	Alt # 3 Route 376 Wells - South	Alt # 4 Route 376 Wells - North
Base O&M	$68,564.00	$82,000.00	$76,000.00
Increase for Private WC	$12,000.00	$14,350.00	$13,300.00
Adjusted O&M	$80,564.00	$96,350.00	$89,300.00
Adjusted 30 yr PW-O&M	$1,392,952.00	$1,666,084.00	$1,543,997.00
Increase in PW	$207,344.00	$248,140.00	$229,805.00

6 COMPARATIVE ANALYSIS OF ALTERNATIVES

This section presents a comparative analysis of the alternatives described in Section 3. The purpose of this section is to summarize in a comparative manner the alternatives with respect to the evaluation criteria specified in the Alternative Water Supply Response Action Work Plan dated December 13, 2001.

6.1 Summary of Evaluation Criteria

Table 6.01 represents an evaluation matrix which summarizes the detailed evaluation presented in Section 5. One important element of this evaluation is the status of contracts to secure source supplies from each of these alternatives. The following is a brief statement of the status of contracts for each alternative:

- Alternative #1, Town of Fishkill: Contract approval by Town of Fishkill Board 11/5/03; scheduled for Town of East Fishkill Board consideration 11/13/03.
- Alternative #2, Dutchess County Pipeline: Memorandum of Understanding signed May 6, 2002, contract being negotiated.
- Alternative #3, Route 376 Properties, Parcel A: An option alrady exists for IBM to purchase the water supply parcel.
- Alternative #4, Route 376 Properties, Parcel B: An option already exists for IBM to purchase the water supply parcel.

Table 6.01
Evaluation Matrix

	Alternative #1 Town of Fishkill	Alternative #2 Dutchess Co. Pipeline	Alternative #3 Route 376 Wells-A	Alternative #4 Route 376 Wells-B
Overall Protection of Human Health & the Environment	This alternative provides for the protection of human health and the environment through the supply of a reliable and uncontaminated source of potable water to the Shenandoah Road Superfund Site.	This alternative provides for the protection of human health and the environment through the supply of a reliable and uncontaminated source of potable water to the Shenandoah Road Superfund Site.	This alternative provides for the protection of human health and the environment through the supply of a reliable and uncontaminated source of potable water to the Shenandoah Road Superfund Site.	This alternative provides for the protection of human health and the environment through the supply of a reliable and uncontaminated source of potable water to the Shenandoah Road Superfund Site.
Compliance with ARARS	Applicable drinking water standards achieved. Pipeline installation will comply with locally specific ARARS. Applicable permits and approval will be obtained prior to construction. State and federal system requirements will be achieved.	Applicable drinking water standards achieved. Pipeline installation will comply with locally specific ARARS. Applicable permits and approval will be obtained prior to construction. State and federal system requirements will be achieved.	Applicable drinking water standards achieved. Pipeline installation will comply with locally specific ARARS. Applicable permits and approval will be obtained prior to construction. Development of source will increase approval requirements. State and federal system requirements will be achieved.	Applicable drinking water standards achieved. Pipeline installation will comply with locally specific ARARS. Applicable permits and approval will be obtained prior to construction. Development of source will increase approval requirements. State and federal system requirements will be achieved.
Long Term Effectiveness	Effective in providing a long-term, reliable source of potable water. Water supply exhibits moderate hardness and chloride concentrations. Supply would be guaranteed by contract between the Towns of Fishkill and East Fishkill. Homeowner softening may be desirable. The Town of Fishkill has a long history of water supply and distribution service.	Effective in providing a long-term, reliable source of potable water. Effective also in terms of multi-governmental ownership of source and distribution works to point of connection on Route 52. This includes the City of Poughkeepsie, Town of Poughkeepsie, Dutchess County Water Authority(pipeline only). Water source upgrade currently being constructed to: expand capacity, improve filtration efficiency and eliminate total trihalomethanes (TTHMs). The City of Poughkeepsie and Town of Poughkeepsie have a long history of water supply and distribution service.	Effective in providing a long-term, reliable source of potable water. Water supply has high hardness concentrations and will require treatment for manganese. There is a high likelihood of on-going well redevelopment costs. Homeowner softening will be desirable.	Effective in providing a long-term, reliable source of potable water. Water supply has high hardness concentrations and high chloride concentrations. There is a high likelihood of on-going well redevelopment costs. Homeowner softening will be desirable.
Reduction of Toxicity, Mobility & Volume	This alternative reduces the potential for toxicity to humans by providing clean, potable water.	This alternative reduces the potential for toxicity to humans by providing clean, potable water.	This alternative reduces the potential for toxicity to humans by providing clean, potable water.	This alternative reduces the potential for toxicity to humans by providing clean, potable water.

Table 6.01
Evaluation Matrix

	Alternative #1 Town of Fishkill	Alternative #2 Dutchess Co. Pipeline	Alternative #3 Route 376 Wells-A	Alternative #4 Route 376 Wells-B
Short Term Effectiveness	This alternative has an estimated time of completion of twenty-six (26) months from decision. This alternative requires extensive work in the boundaries of N.Y.S. Route 52 which may lead to significant, short-term traffic safety and delay issues. There is one major creek crossing and three minor creek crossings associated with this route.	This alternative has an estimated time of completion of twenty-four (24) months from decision. This alternative requires some work in the boundaries of N.Y.S. Route 52 which may lead to moderate, short-term traffic safety and delay issues. There are three minor creek crossings associated with this route.	This alternative has an estimated time of completion of twenty-eight (28) months from decision. There are three minor creek crossings associated with this route, along with minor work in the boundaries of N.Y.S. Route 52. This alternative includes additional source design and approvals. Wetlands permitting issues may also be involved at the source.	This alternative has an estimated time of completion of twenty-eight (28) months from decision. There are three minor creek crossings associated with this route, along with minor work in the boundaries of N.Y.S. Route 52 and extensive work along Route 376. This alternative includes additional source design and approvals. Wetlands permitting issues will be involved at the source.
Constructability	This alternative is constructable. It requires the installation of 20,000 +/- feet of pipeline, a booster station, meter pit and numerous incidentals. There is a significant amount of work required in the N.Y.S. Route 52 right-of-way.	This alternative is highly constructable. It requires the installation of 13,000 +/- feet of pipeline, a booster station, meter pit and numerous incidentals. There is a moderate amount of work required in the N.Y.S. Route 52 right-of-way.	This alternative is deemed constructable. It requires the installation of 12,000 +/- feet of pipeline including incidentals, and significant source improvements, including: well field, chlorination and pump house, contact tank and manganese treatment. There is a moderate amount of work required in the N.Y.S. Route 52 right-of-way.	This alternative is deemed constructable. It requires the installation of 15,500 +/- feet of pipeline including incidentals, and significant source improvements, including: well field, chlorination and pump house, and contact tank .There is a moderate amount of work required in the N.Y.S. Route 52 right-of-way and significant work along Route 376.
Reliability	This alternative is deemed highly reliable due to the pending inter-municipal involvement and guarantee of water delivery by the Town of Fishkill.	This alternative is deemed highly reliable due to the multiple municipal ownership of the sources, including viable surface and groundwater supplies, and the involvement of the Dutchess County Water and Wastewater Authority in the design and construction of the proposed pipeline and related improvements from the Town of Poughkeepsie to East Fishkill.	This alternative is deemed reliable due to the anticipated municipal ownership of the sources and distribution improvements. It is also possible, should the Town of East Fishkill opt to not establish a Water District, that ownership and operation would be passed to a reputable private water company.	This alternative is deemed reliable due to the anticipated municipal ownership of the sources and distribution improvements. It is also possible, should the Town of East Fishkill opt to not establish a Water District, that ownership and operation would be passed to a reputable private water company selected by IBM Corporation.

Table 6.01
Evaluation Matrix

	Alternative #1 Town of Fishkill	Alternative #2 Dutchess Co. Pipeline	Alternative #3 Route 376 Wells-A	Alternative #4 Route 376 Wells-B
Expandability	The proposed distribution system is expandable. The proposed water purchase agreement is currently sets aside 80,000 gallons per day on an average daily use basis, which would allow for small to moderate expansion along the proposed route and adjacent to the proposed water service area at Shenandoah.	The proposed distribution system is expandable. The source is plentiful and would allow for moderate to large expansion along the proposed route and adjacent to the proposed water service area at Shenandoah.	The proposed distribution system is expandable. The source is plentiful and would allow for moderate expansion along the proposed route and adjacent to the proposed water service area at Shenandoah.	The proposed distribution system is expandable. The source is plentiful and would allow for moderate expansion along the proposed route and adjacent to the proposed water service area at Shenandoah.
Administrative Feasibility	A three-party agreement is required between the Town of Fishkill, Town of East Fishkill and IBM Corporation for allocation of water supply for this project. This contract was approved by the Town of Fishkill Board on November 5, 2003 and is scheduled to go before the Town of East Fishkill Board for approval on November 13, 2003.	A memorandum of understanding was entered into on May 6, 2002 by and between the following parties: Dutchess County Water & Wastewater Authority, City of Poughkeepsie, Town of Poughkeepsie, Poughkeepsie Joint Water Board, and IBM Corporation. Negotiations are currently proceeding with respect to a final agreement. Detailed plans and specifications have been prepared and submitted to appropriate agencies for review and approval.	An option agreement currently exists for the acquisition of the water supply parcel by IBM Corporation.	An option agreement currently exists for the acquisition of the water supply parcel by IBM Corporation.
COST				
Source & Transmission	$ 4,160,120.00	$ 2,474,235.00	$ 3,714,345.00	$ 3,982,700.00
Water District	$ 4,632,845.00	$ 4,632,845.00	$ 4,632,845.00	$ 4,632,845.00
Total Capital	$ 8,792,965.00	$ 7,107,080.00	$ 8,347,190.00	$ 8,615,945.00
O&M-30yr Present Worth	$ 1,187,701.00	$ 1,227,282	$ 1,417,944.00	$ 1,314,192.00
PRESENT WORTH	$ 9,980,666.00	$ 8,334,362.00	$ 9,765,134.00	$ 9,929,737.00
Cost per 1000 gallons	$ 5.70	$ 5.90	$ 6.80	$ 6.30

6.2 Capital Costs

6.2.1 Capital Cost of Shenandoah Road Water Service Area

The capital cost associated with design and construction of the water distribution and storage elements for the immediate service area is presented in detail in Table 6.02. These costs are common to all four water supply alternatives.

Table 6.02
Opinion of Probable Cost
Water Distribution System -Shenandoah Service Territory

Item	Payment Unit	Unit Price	Estimated Quantity	Total
8 inch Ductile Iron Pipe	lin ft	$47.00	20000	$940,000.00
8 inch Gate Valve	each	$1,100.00	24	$26,400.00
D.I. Specials	tons	$3,000.00	6	$18,000.00
Hydrant & Valve Assbly	each	$2,900.00	40	$116,000.00
3/4 inch copper service	each	$1,400.00	150	$210,000.00
Pavement Restoration	sq. yds.	$20.00	13500	$270,000.00
Rock Excavation	cu. yds.	$60.00	2500	$150,000.00
Select Backfill	cu. yds.	$20.00	7500	$150,000.00
I-84 Crossing in Casing Pipe	each	$90,000.00	1	$90,000.00
150,000 gallon standpipe	each	$280,000.00	1	$280,000.00
Maintenance & Prot of Traffic	lump sum			$110,000.00
Individual Household Connections	each	$10,500.00	137	$1,438,500.00
Easements and Land	allowance			$80,000.00
Sub-Total Construction				$3,878,900.00
Contingencies			5%	$193,945.00
Total Construction				$4,072,845.00
Technical Services-Survey, Design	allowance		8%	$320,000.00
Construction Inspection	allowance		4%	$160,000.00
Permits and Admin	allowance		2%	$80,000.00
Total Cost				$4,632,845.00

6.2.2 Capital Cost of Alternative No. 1 - Town of Fishkill

The total capital cost of the Town of Fishkill Alternative is presented in Table 6.02(a) and includes installation of the transmission route from Fishkill to Shenandoah, Capital Contribution to Fishkill, and the Water Service Distribution at Shenandoah (from Table 6.02).

Table 6.02(a): Total Capital Cost of Alternative #1

Item	Description	Pay Unit	Unit Price	Est Qty	Total
1	8" Ductile Iron Pipe in Town or County Rd.	LF	$ 47.00	9,780.00	$ 459,660.00
2	8" Gate Valve in Town or County Rd.	Each	$ 1,100.00	12.00	$ 13,200.00
3	8" Ductile Iron Pipe in NYS Highway	LF	$ 62.00	10,800.00	$ 669,600.00
4	8" Gate Valve in NYS Highway	Each	$ 1,250.00	11.00	$ 13,750.00
5	Ductile Iron Specials	Ton	$ 3,000.00	7.00	$ 21,000.00
6	Pavement Restoration in Town or County Hwy.	SY	$ 20.00	7,855.00	$ 157,100.00
7	Pavement Restoration in NYS Highway	SY	$ 25.00	7,200.00	$ 180,000.00
8	Hydrant & Valve Assembly	Each	$ 2,900.00	30.00	$ 87,000.00
9	Rock Excavation	CY	$ 60.00	2,500.00	$ 150,000.00
10	Select Backfill	CY	$ 20.00	7,500.00	$ 150,000.00
11	Flowable Backfill	CY	$ 84.00	2,200.00	$ 184,800.00
12	NYS Highway Crossing in 24" Casing	Each	$ 60,000.00	2.00	$ 120,000.00
13	I-84 Highway Crossing in 24" Casing	Each	$ 90,000.00		$ 0
14	Air Release Valve & Chamber	Each	$ 7,000.00	2.00	$ 14,000.00
15	Major Creek Crossing	Each	$ 125,000.00	1.00	$ 125,000.00
16	Minor Creek or Stream Crossing	Each	$ 70,000.00	3.00	$ 210,000.00
17	Master Meter Chamber	Each	$ 85,000.00	1.00	$ 85,000.00
18	Maintenance & Protection of Traffic	Lump Sum			$ 110,000.00
19	Water Booster Station	Each	$ 210,000.00	1.00	$ 210,000.00
20	Capital Contr to Water System (1)	GPD	$ 5.32	80,000.00	$ 425,600.00
21	Water Supply Development				$ -
22	Land and Rights-of-Way				$ -
23	Sub-Total Construction				$ 3,385,710.00
24	Contingencies			5%	$ 170,000.00
	TOTAL CONSTRUCTION				$ 3,555,710.00
	All Indirect Costs -allowance			17%	$ 604,410.00

Table 6.02(a): Total Capital Cost of Alternative #1					
Item	**Description**	**Pay Unit**	**Unit Price**	**Est Qty**	**Total**
	Total Cost for Source & Transmission to SST				$ 4,160,120.00
	Water District Distribution - Table 6.02				$ 4,632,845.00
	TOTAL PROJECT COST				$ 8,792,965.00

(1) Reflects Contribution to Town of Fishkill for purchase of 80,000 gpd of capacity of Snook Road Well Supply

6.2.3 Capital Cost of Alternative No. 2 - Dutchess County Pipeline

The total capital cost of the Dutchess County Pipeline Alternative is presented in Table 6.02(b) and includes installation of the transmission system from terminus of the proposed Dutchess County Pipeline on Route 52 to Shenandoah, and the Water Service Distribution at Shenandoah (from Table 6.02).

Table 6.02(b): Total Capital Cost of Alternative #2					
Item	**Description**	**Pay Unit**	**Unit Price**	**Est Qty**	**Total**
1	8" Ductile Iron Pipe in Town or County Rd.	LF	$ 47.00	9,780.00	$ 459,660.00
2	8" Gate Valve in Town or County Rd.	Each	$ 1,100.00	12.00	$ 13,200.00
3	8" Ductile Iron Pipe in NYS Highway	LF	$ 62.00	3,400.00	$ 210,800.00
4	8" Gate Valve in NYS Highway	Each	$ 1,250.00	4.00	$ 5,000.00
5	Ductile Iron Specials	Ton	$ 3,000.00	5.50	$ 16,500.00
6	Pavement Restoration in Town or County Hwy.	SY	$ 20.00	7,855.00	$ 157,100.00
7	Pavement Restoration in NYS Highway	SY	$ 25.00	2,400.00	$ 60,000.00
8	Hydrant & Valve Assembly	Each	$ 2,900.00	27.00	$ 78,300.00
9	Rock Excavation	CY	$ 60.00	2,400.00	$ 144,000.00
10	Select Backfill	CY	$ 20.00	3,800.00	$ 76,000.00
11	Flowable Backfill	CY	$ 84.00	1,100.00	$ 92,400.00
12	NYS Highway Crossing in 24" Casing	Each	$ 60,000.00	1.00	$ 60,000.00
13	I-84 Highway Crossing in 24" Casing	Each	$ 90,000.00		$ -
14	Air Release Valve & Chamber	Each	$ 7,000.00	2.00	$ 14,000.00
15	Major Creek Crossing	Each	$ 125,000.00	-	$ -
16	Minor Creek or Stream Crossing	Each	$ 70,000.00	3.00	$ 210,000.00
17	Master Meter Chamber	Each	$ 85,000.00	1.00	$ 85,000.00

Table 6.02(b): Total Capital Cost of Alternative #2					
Item	Description	Pay Unit	Unit Price	Est Qty	Total
18	Maintenance & Protection of Traffic	Lump Sum		1.00	$ 105,000.00
19	Water Booster Station	Each	$ 210,000.00	1.00	$ 210,000.00
20	Capital Contr to Water System (1)	GPD			$ -
21	Water Supply Development				$ -
22	Land and Rights-of-Way				$ -
23	Sub-Total Construction				$ 1,996,960.00
24	Contingencies			5%	$ 99,850.00
	TOTAL CONSTRUCTION				$ 2,096,810.00
	All Indirect Costs -allowance			18%	$ 377,425.00
	Total Cost for Source & Transmission to SST				$ 2,474,235.00
	Water District Distribution - Table 6.02				$ 4,632,845.00
	TOTAL PROJECT COST				$ 7,107,080.00

6.2.4 Capital Cost of Alternative No. 3 - Route 376 Wells - South (A)

The total capital cost of the Route 376 Wells-South Alternative is presented in Table 6.02(c) and includes: installation of the transmission route from the southern well field near Old Stage Road to Shenandoah, the Water Service Distribution at Shenandoah (from Table 6.02), and source treatment and development work at the well site. Land purchase is also included.

Table 6.02(c): Total Capital Cost of Alternative #3					
Item	Description	Pay Unit	Unit Price	Est Qty	Total
1	8" Ductile Iron Pipe in Town or County Rd.	LF	$ 47.00	11,400.00	$ 535,800.00
2	8" Gate Valve in Town or County Rd.	Each	$ 1,100.00	16.00	$ 17,600.00
3	8" Ductile Iron Pipe in NYS Highway	LF	$ 62.00	600.00	$ 37,200.00
4	8" Gate Valve in NYS Highway	Each	$ 1,250.00	3.00	$ 3,750.00
5	Ductile Iron Specials	Ton	$ 3,000.00	4.50	$ 13,500.00
6	Pavement Restoration in Town or County Hwy.	SY	$ 20.00	7,600.00	$ 152,000.00
7	Pavement Restoration in NYS Highway	SY	$ 25.00	2,000.00	$ 50,000.00
8	Hydrant & Valve Assembly	Each	$ 2,900.00	27.00	$ 78,300.00
9	Rock Excavation	CY	$ 60.00	3,600.00	$ 216,000.00

Table 6.02(c): Total Capital Cost of Alternative #3					
Item	Description	Pay Unit	Unit Price	Est Qty	Total
10	Select Backfill	CY	$ 20.00	4,400.00	$ 88,000.00
11	Flowable Backfill	CY	$ 84.00	400.00	$ 33,600.00
12	NYS Highway Crossing in 24" Casing	Each	$ 60,000.00	1.00	$ 60,000.00
13	I-84 Highway Crossing in 24" Casing	Each	$ 90,000.00	-	$ -
14	Air Release Valve & Chamber	Each	$ 7,000.00	1.00	$ 7,000.00
15	Major Creek Crossing	Each	$ 125,000.00	-	$ -
16	Minor Creek or Stream Crossing	Each	$ 70,000.00	3.00	$ 210,000.00
17	Master Meter Chamber	Each	$ 85,000.00		
18	Maintenance & Protection of Traffic	Lump Sum			$ 95,000.00
19	Water Booster Station	Each	$ 210,000.00		$ -
20	Capital Contr to Water System	GPD			$ -
21	Water Supply Development				$ 900,000.00
22	Land and Rights-of-Way				$ 500,000.00
23	Sub-Total Construction				$ 2,997,750.00
24	Contingencies			5%	$ 150,000.00
	TOTAL CONSTRUCTION				$ 3,147,750.00
	All Indirect Costs -allowance			18%	$ 566,595.00
	Total Cost for Source & Transmission to SST				$ 3,714,345.00
	Water District Distribution - Table 6.02				$ 4,632,845.00
	TOTAL PROJECT COST				$ 8,347,190.00

6.2.5 Capital Cost of Alternative No. 4 - Route 376 Wells - North (B)

The total capital cost of the Route 376 Wells-North Alternative is presented in Table 6.02(d) and includes: installation of the transmission route from the northerly well field west of Route 376 to Shenandoah, the Water Service Distribution at Shenandoah (from Table 6.02), and source treatment and development work at the well site. Land purchase is also included.

Table 6.02(d): Total Capital Cost of Alternative #4					
Item	**Description**	**Pay Unit**	**Unit Price**	**Est Qty**	**Total**
1	8" Ductile Iron Pipe in Town or County Rd.	LF	$ 47.00	14,900.00	$ 700,300.00
2	8" Gate Valve in Town or County Rd.	Each	$ 1,100.00	18.00	$ 19,800.00
3	8" Ductile Iron Pipe in NYS Highway	LF	$ 62.00	600.00	$ 37,200.00
4	8" Gate Valve in NYS Highway	Each	$ 1,250.00	3.00	$ 3,750.00
5	Ductile Iron Specials	Ton	$ 3,000.00	5.00	$ 15,000.00
6	Pavement Restoration in Town or County Hwy.	SY	$ 20.00	10,000.00	$ 200,000.00
7	Pavement Restoration in NYS Highway	SY	$ 25.00	2,000.00	$ 50,000.00
8	Hydrant & Valve Assembly	Each	$ 2,900.00	32.00	$ 92,800.00
9	Rock Excavation	CY	$ 60.00	3,800.00	$ 228,000.00
10	Select Backfill	CY	$ 20.00	5,600.00	$ 112,000.00
11	Flowable Backfill	CY	$ 84.00	400.00	$ 33,600.00
12	NYS Highway Crossing in 24" Casing	Each	$ 60,000.00	1.00	$ 60,000.00
13	I-84 Highway Crossing in 24" Casing	Each	$ 90,000.00	-	$ -
14	Air Release Valve & Chamber	Each	$ 7,000.00	1.00	$ 7,000.00
15	Major Creek Crossing	Each	$ 125,000.00	-	$ -
16	Minor Creek or Stream Crossing	Each	$ 70,000.00	3.00	$ 210,000.00
17	Master Meter Chamber	Each	$ 85,000.00		
18	Maintenance & Protection of Traffic	Lump Sum			$ 95,000.00
19	Water Booster Station	Each	$ 210,000.00		$ -
20	Capital Contr to Water System	GPD			$ -
21	Water Supply Development				$ 850,000.00
22	Land and Rights-of-Way				$ 500,000.00
23	Sub-Total Construction				$ 3,214,450.00
24	Contingencies			5%	$ 160,720.00
	TOTAL CONSTRUCTION				$ 3,375,170.00
	All Indirect Costs -allowance			18%	$ 607,530.00
	Total Cost for Source & Transmission to SST				$ 3,982,700.00
	Water District Distribution - Table 6.02				$ 4,632,845.00
	TOTAL PROJECT COST				**$ 8,615,545.00**

6.3 Operation and Maintenance Cost-Comparative

The comparative operation and maintenance costs of each of the alternatives is presented in detail in Table 6.03.

Included in the table is the present worth of operation and maintenance costs based on a thirty year period with an interest rate of 4 per cent (%). Consistent with USEPA guidance documents, this rate represents the prevailing general rate of interest charged on long-term financing of municipal capital projects. For alternatives #1 & #2, the cost of bulk water purchase is provided based on information presented by the two providers.

Table 6.03
Operation And Maintenance Costs-Comparative

Item	Description	T/Fishkill Alt #1	Dutchess Co. Alt # 2	376 Wells-A Alt #3	376 Wells-B Alt # 4
1	Bulk Water Purchase-12 million gal/year by water purveyor	$ 28,185.00 (1)	$ 30,474.00 (2)	$ -	$ -
2	Chemicals	$ -	$ -	$ 6,000.00	$ 6,000.00
3	Electricity	$ 3,000.00	$ 3,000.00	$ 8,000.00	$ 8,000.00
4	Insurance	$ 4,000.00	$ 4,000.00	$ 6,000.00	$ 6,000.00
5	Part-Time Operator	$ 16,000.00	$ 16,000.00	$ 22,000.00	$ 22,000.00
6	Benefits & Payroll Taxes	$ 8,000.00	$ 8,000.00	$ 8,000.00	$ 8,000.00
7	Maintenance & Repair	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 4,000.00
8	Analytical Testing	$ 1,500.00	$ 1,500.00	$ 4,000.00	$ 4,000.00
9	Well Redevelopment-Annual Fund	$ -	$ -	$ 14,000.00	$ 14,000.00
10	Bookkeeping & Admin	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 4,000.00
11	Manganese Sequestration	$	$	$ 6,000.00	$
	TOTAL ANNUAL COST	$ 68,685.00	$ 70,974.00	$ 82,000.00	$ 76,000.00
	Present Worth: 30 years O&M (3)	$ 1,187,701.00	$ 1,227,282.00	$ 1,417,944.00	$ 1,314,192.00

(1) based on a projected purchase rate of $2.34/1000 gallons

(2) based on a projected purchase rate of $2.53/1000 gallons

(3) total present worth of annual operational expenses calculated by formula:

$$\text{Present Worth} = \frac{(1+i)^n - 1}{i(1+i)^n} \quad \text{Where: } i=4\%,\ n=30 \text{ years}$$

6.4 Total Present Worth - Comparative

The total present worth of each alternative is presented compariatively in Table 6.04, based on a thirty year operation and maintenance period.

Table 6.04: Total Present Worth - Comparative

Description	T/Fishkill Alt #1	Dutchess Co. Alt # 2	376 Wells-A Alt #3	376 Wells-B Alt # 4
Capital Cost for SST	$4,632,845.00	$4,632,845.00	$4,632,845.00	$4,632,845.00
Capital Cost for Source & Transmission to SST	$4,160,120.00	$2,474,235.00	$3,714,345.00	$3,982,700.00
TOTAL CAPITAL COST	$8,792,965.00	$7,107,080.00	$8,347,190.00	$8,615,545.00
TOTAL ANNUAL O&M COST	$68,685.00	$70,974.00	$82,000.00	$76,000.00
Present Worth: 30 years O&M	$1,187,701.00	$1,227,282.00	$1,417,944.00	$1,314,192.00
TOTAL PRESENT WORTH	$9,980,666.00	$8,334,362.00	$9,765,134.00	$9,929,737.00

6.5 ARARs and TBCs - Comparative

Applicable or relevant and appropriate requirements (ARARs) are presented in a comparative format in Table 6.05, along with TBCs.

Table 6.05: Comparison of ARARs and TBCs

ARARS	Alternative #1 T/Fishkill	Alternative #2 Dutchess County	Alternative #3 Route 376 Wells-A (South)	Alternative #4 Route 376 Wells-B (North)
Ten State Standards & NYCRR Chapter 1 Subpart 5-1 (public water systems)	Yes, C.A.	Yes, C.A.	Yes, CA with with manganese treatment	Yes, C.A.
USEPA Drinking Water Standards	Yes, C.A.	Yes, C.A.	Yes, CA with with manganese treatment	Yes, C.A.
NYS Groundwater Standards	N.A.	N.A.	N.A.	N.A.
NYS Surface Water Standards-SPDES	N.A.	N.A.	Yes, only if filter backwash required	N.A.
National Historic Preservation Act	Yes, C.A.	Yes, C.A.	Yes, C.A.	Yes, C.A.
USEPA Sec. 404 of Clean Water Act	N.A.	N.A.	Yes, C.A.	Yes, C.A.

Table 6.05: Comparison of ARARs and TBCs				
ARARS	**Alternative #1 T/Fishkill**	**Alternative #2 Dutchess County**	**Alternative #3 Route 376 Wells-A (South)**	**Alternative #4 Route 376 Wells-B (North)**
USACOE Section 401 of Clean Water Act	N.A.	N.A.	Yes, only if filter backwash required	N.A.
Town Law-Article 12 or 12A of NYS Title 2, Part 85	Yes, C.A.	Yes, C.A.	Yes, C.A.	Yes, C.A.
6 NYCRR Part 601-Water Supply Application	Yes, C.A.	Yes, C.A.	Yes, C.A.	Yes, C.A.
6 NYCRR Part 617-SEQRA	Yes for local actions	Yes for local actions	Yes for local actions	Yes for local actions
Transportation Corporation Laws, Section 3, 116&117	N.A.	N.A., unless private option selected	N.A., unless private option selected	N.A., unless private option selected
TBCS				
Executive Order 11988-Floodplain Management	N.A.	N.A.	Yes, C.A.	Yes, C.A.
Executive Order 11990-Protection of Wetlands	Yes, C.A.	Yes, C.A.	Yes, C.A.	Yes, C.A.
EPA Policy on Floodplains and Wetlands Assessments for CERCLA Actions	Yes, C.A.	Yes, C.A.	Yes, C.A.	Yes, C.A.
6 NYCRR Part 662-NYS Wetlands	N.A.	N.A.	Yes, C.A.	Yes, C.A.
Endangered Species Act, Etc.	Yes, C.A.	Yes, C.A.	Yes, C.A.	Yes, C.A.
Preservation of Historical and Archaelogical Data Act	Yes, C.A.	Yes, C.A.	Yes, C.A.	Yes, C.A.
Town of East Fishkill Highway Specs	Yes, C.A.	Yes, C.A.	Yes, C.A.	Yes, C.A.
NYS DOT Highway Specifications	Yes, C.A.	Yes, C.A.	Yes, C.A.	Yes, C.A.
Dutchess County Highway Specs	Yes, C.A.	Yes, C.A.	Yes, C.A.	Yes, C.A.
USEPA Drinking Water Advisories	Yes, C.A.	Yes, C.A.	Yes, C.A.	Yes, C.A.
NYS SDPES Permit for Construction Activities	Yes, C.A.	Yes, C.A.	Yes, C.A.	Yes, C.A.

Note: C.A. refers to compliance achieved or achievable

6.6 Comparison of Implementation Schedules

Comparison of implementation schedules for each alternative is provided in Table 6.06. Implementation for Alternatives #1 & #2 also includes anticipated dates of delivery of bulk water by the Town of Fishkill and Dutchess County Water and Wastewater Authority, respectively. These dates are considered the best available information and were furnished by the respective parties. The schedule assumes a selection of one of the water supply alternatives by January, 2004.

Table 6.06
Comparison of Implementation Completion Dates

Schedule of Completion Implementation Tasks	T/Fishkill Alt #1	Dutchess Co. Alt # 2	376 Wells-A Alt #3	376 Wells-B Alt # 4
Survey and Base Mapping	2nd Qtr - 2004	1st Qtr - 2004	1st Qtr - 2004	1st Qtr - 2004
Preliminary Design	3rd Qtr - 2004	2nd Qtr - 2004	3rd Qtr - 2004	3rd Qtr - 2004
Permit Applications/ARARS	3rd Qtr - 2004	3rd Qtr - 2004	3rd Qtr - 2004	3rd Qtr - 2004
Final Design	4th Qtr - 2004	3rd Qtr - 2004	4th Qtr - 2004	4th Qtr - 2004
Regulatory Approvals	4th Qtr - 2004	4th Qtr - 2004	1st Qtr - 2005	1st Qtr - 2005
Bidding and Contract Procurement	1st Qtr - 2005	1st Qtr - 2005	1st Qtr - 2005	1st Qtr - 2005
Construction	4th Qtr - 2005	4th Qtr - 2005	1st Qtr - 2006	1st Qtr - 2006
System Testing and Operations	1st Qtr - 2006	4th - 2005	1st Qtr - 2006	1st Qtr - 2006
FINAL COMPLETION	1st Qtr - 2006	1st Qtr - 2006	2nd Qtr - 2006	2nd Qtr - 2006
Completion of Source Delivery	Sept 2004	Dec 2005	N.A.	N.A.

6.7 Drinking Water Standards and Quality Issues

All four alternatives are feasible water supplies for the Shenandoah Road area, in terms of both quantity and quality. There are, however, differences in water chemistry characteristics that may be of interest to the future customers in the service area:

Alternative #1, the Town of Fishkill, exhibits moderate hardness (163 mg/l) and moderate levels of sodium (81 mg/l) and chlorides (103 mg/l). Levels of sodium and chlorides could increase under sustained pumping conditions at the Snook Road well field. High levels of chlorides can lead to

accelerated corrosion of household plumbing fixtures. Hardness is not a regulated water quality parameter, but customers generally opt for household treatment when levels exceed 100-120 mg/l.

Alternative #2, the Dutchess County Pipeline, exhibits low levels of hardness, sodium and chlorides. Sodium and chloride concentrations increase during drought conditions but remain below moderate levels. Past drinking water standards issues related to TTHM's (total trihalomethanes) and Haloacetic acids at the Poughkeepsie Water Filtration Plant are currently being addressed through a capital improvement program and are not expected to be issues by the time implementation of this project is completed. The water supply is also fluoridated.

Alternative #3, Route 376 Well-south, exhibits high hardness (300 mg/l,+/-) and manganese (0.7-0.8 mg/l). The manganese level exceeds the NYS Drinking Water Standard of 0.3 mg/l and would require treatment prior to introduction into the distribution system. Hardness is not a regulated water quality parameter, but customers generally opt for household treatment when levels exceed 100-120 mg/l.

Alternative #4, Route 376 Well-north, exhibits high hardness (300 mg/l+/-) and high levels of sodium (90 mg/l) and chlorides (180 mg/l). Sustained pumping of this well could lead to higher levels of sodium and chlorides. High levels of chlorides can lead to accelerated corrosion of household plumbing fixtures. Hardness is not a regulated water quality parameter, but customers generally opt for household treatment when levels exceed 100-120 mg/l.

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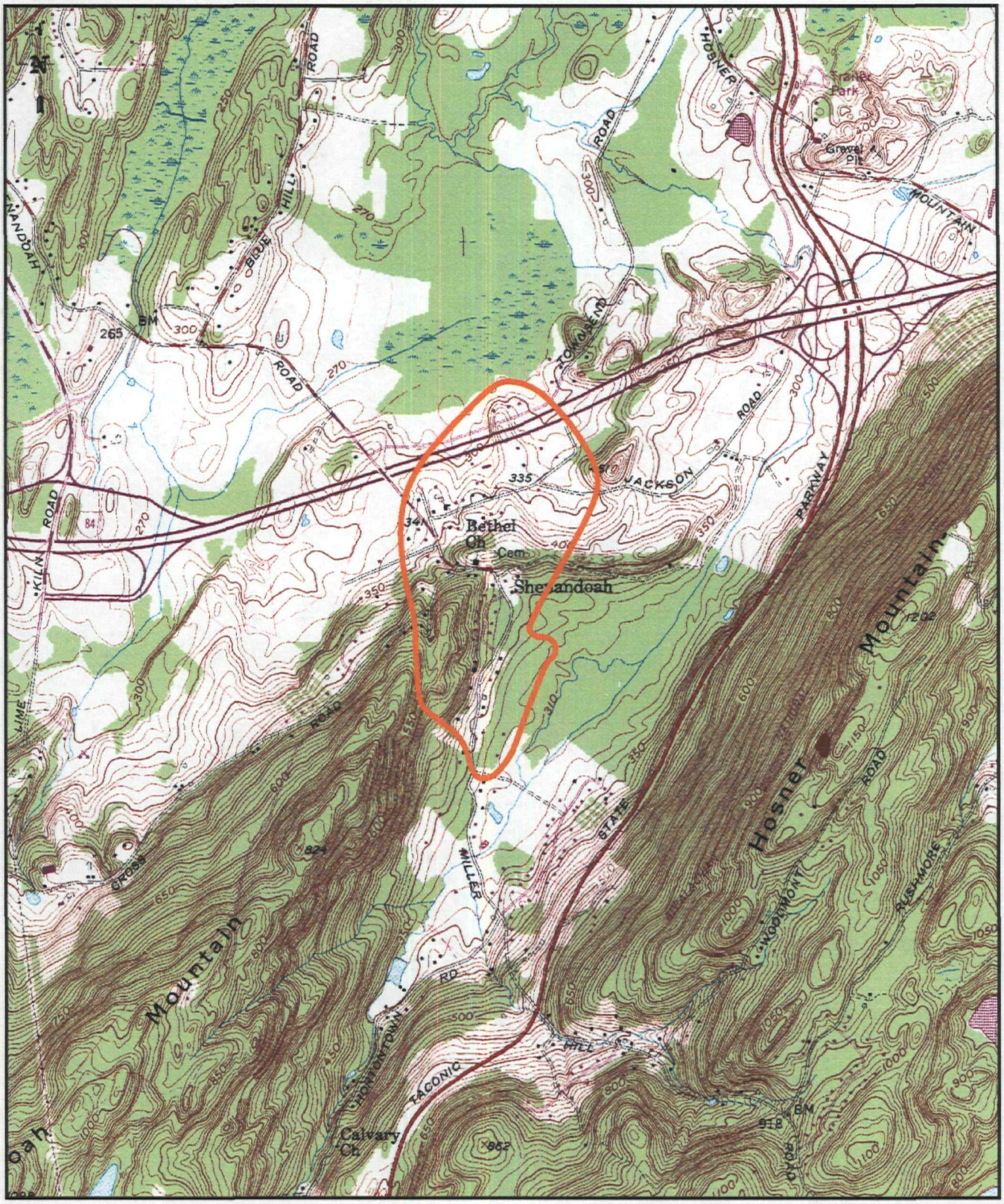


– Limit of Site Constituents Detected

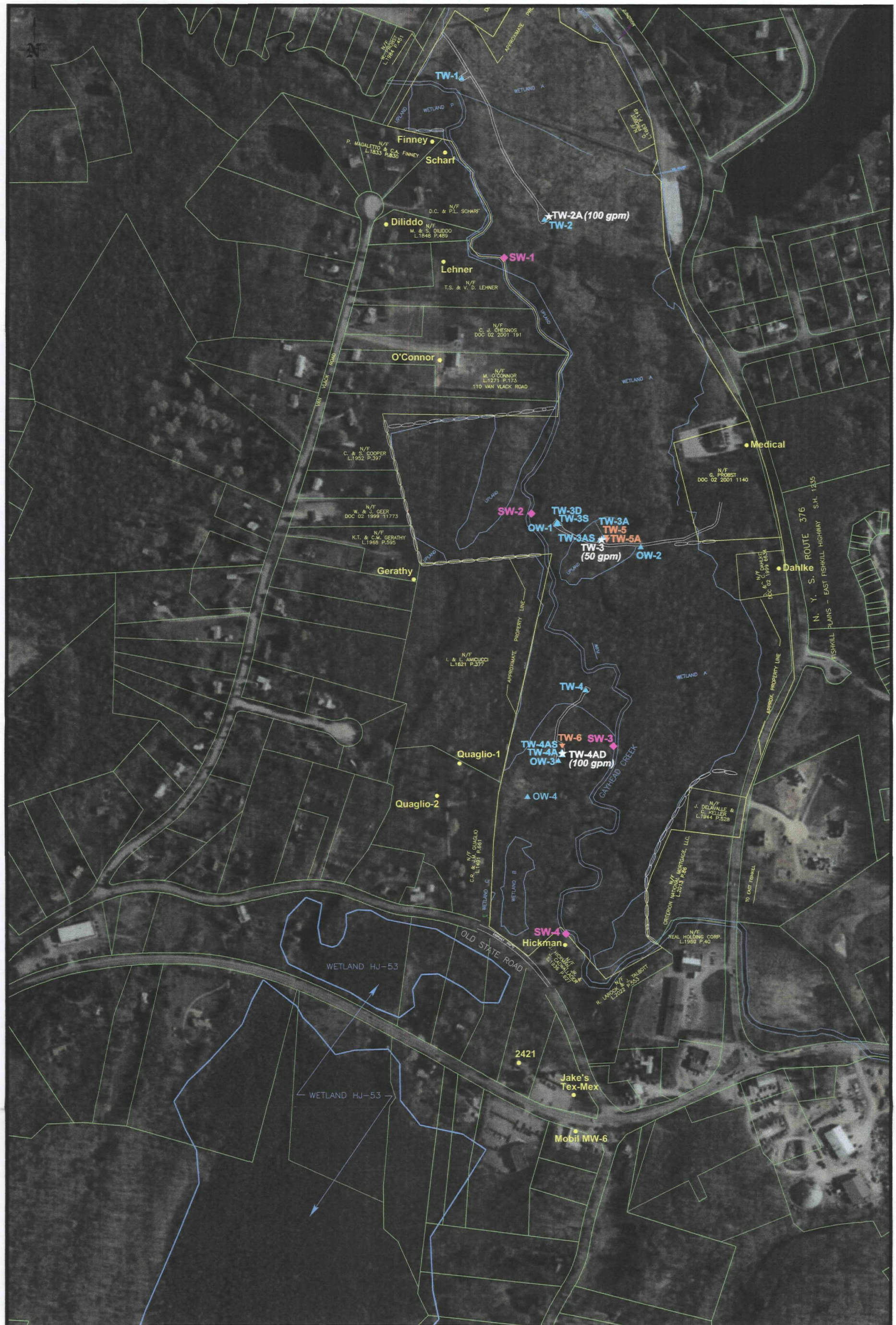
Portion of the Hopewell Junction, NY
7.5-Minute NYSDOT Quadrangle

Figure 1-1
Shenandoah Road Groundwater Contamination Superfund Site

Scale
0 1000' 2000'

GROUNDWATER SCIENCES CORPORATION

21003-002-F4 / 07-29-03



Approximate Scale
0 200' 400'

★ - Pump Test Well
▼ - Bedrock Test Well
▲ - Sand & Gravel Observation Well
● - Residential/Commercial Supply Well
◆ - Surface Water Sampling Location

Property lines approximate; from Dutchess Co. Real Tax Agency.
Wetlands are per flags placed by Lawler, Matusky & Skelly Engineers, LLP.
Basemap from Spectra Engineering, P.C. and LMS Engineers, LLP.

Figure 2-1
Well Location Map
Route 376 Properties, East Fishkill, NY

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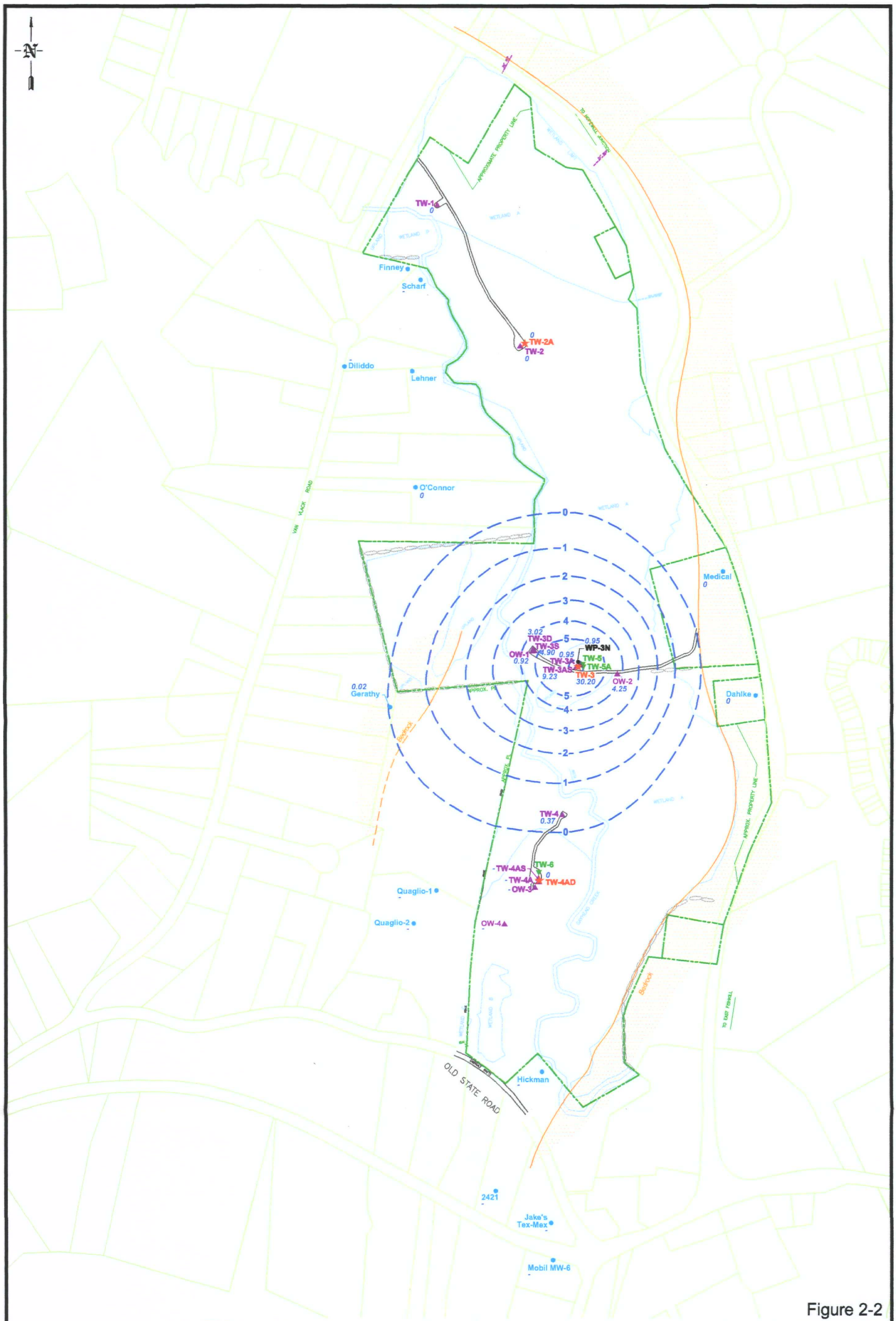
21003-057-E2 / 09-18-03



★ - Pump Test Well
▼ - Bedrock Test Well
▲ - Sand & Gravel Observation Well
● - Residential/Commercial Supply Well
• - Well Point

- Bedrock Limit (approximate)
0.37 - Groundwater Elevation Drawdown (feet)
- Drawdown Elevation Contour (feet)

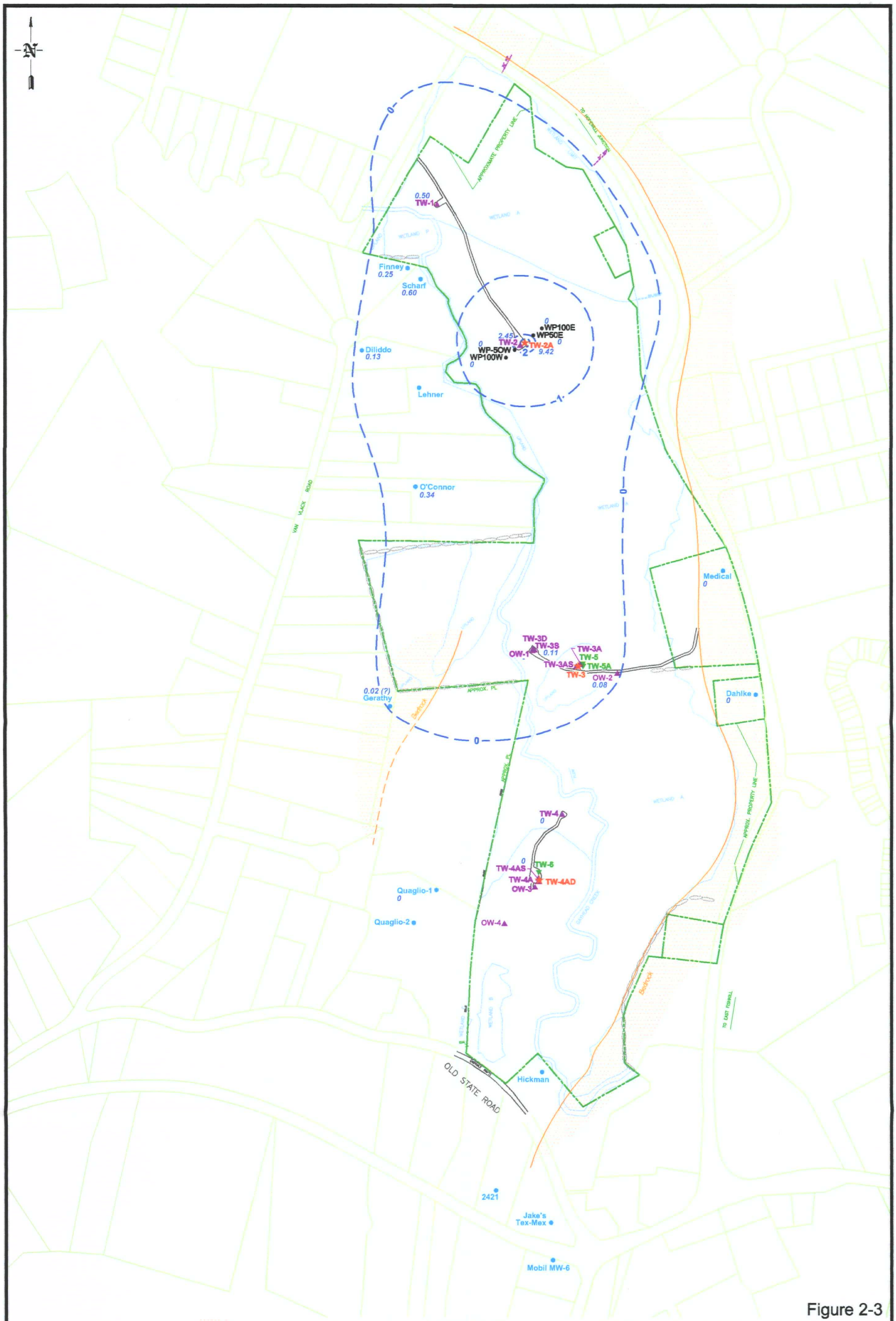
(TW-3 pumping rate = 50 gpm)

Property lines approximate; from Dutchess Co. Real Property Tax Agency.
Wetlands are per flags placed by Lawler, Matusky & Skelly Engineers, LLP.
Basemap developed from Spectra Engineering, P.C. and LMS Engineers, LLP drawings.

Approximate Scale
0 200' 400'

Figure 2-2
TW-3 Pump Test, 72-Hour Drawdown Contour Map
Route 376 Properties, East Fishkill, NY
Alternate Water Supply Response

GROUNDWATER SCIENCES CORPORATION
21003-064-B / 07-31-03



★ - Pump Test Well
▼ - Bedrock Test Well
▲ - Sand & Gravel Observation Well
● - Residential/Commercial Supply Well
• - Well Point

- Bedrock Limit (approximate)
0.11 - Groundwater Elevation Drawdown (feet)
- Drawdown Elevation Contour (feet)

(TW-2A pumping rate = 100 gpm)

Property lines approximate; from Dutchess Co. Real Property Tax Agency.
Wetlands are per flags placed by Lawler, Matusky & Skelly Engineers, LLP.
Basemap developed from Spectra Engineering, P.C. and LMS Engineers, LLP drawings.

Approximate Scale
0 200' 400'

Figure 2-3
TW-2A Pump Test, 72-Hour Drawdown Contour Map
Route 376 Properties, East Fishkill, NY
Alternate Water Supply Response

GROUNDWATER SCIENCES CORPORATION
21003-064-A / 07-31-03

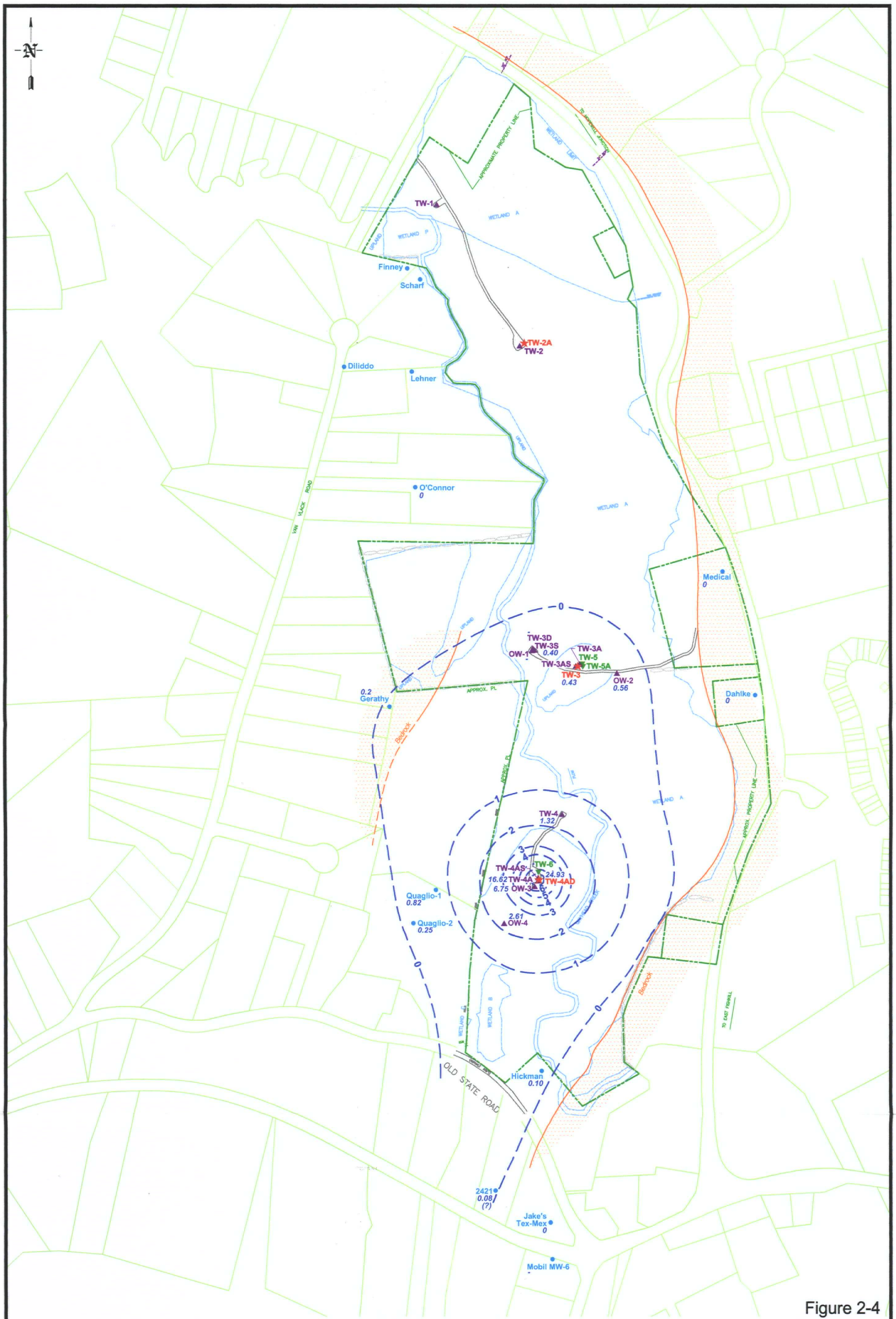


Figure 2-4

TW-4AD Pump Test #1, 72-Hour Drawdown Contour Map
Route 376 Properties, East Fishkill, NY
Alternate Water Supply Response

★ - Pump Test Well
▼ - Bedrock Test Well
▲ - Sand & Gravel Observation Well
● - Residential/Commercial Supply Well

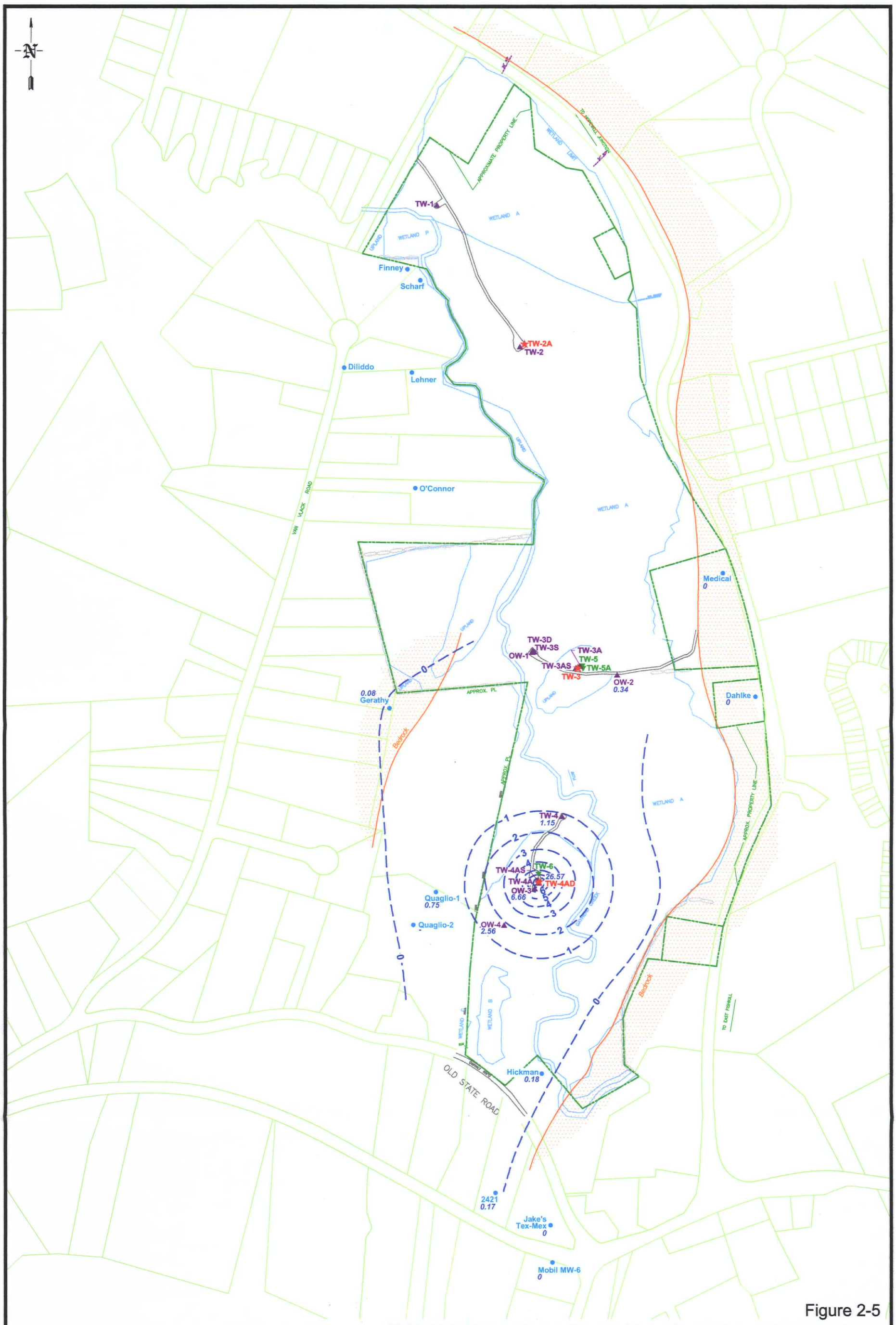
- Bedrock Limit (approximate)
0.25 - Groundwater Elevation Drawdown (feet)
- Drawdown Elevation Contour (feet)

(TW-4AD pumping rate = 100 gpm)

Property lines approximate; from Dutchess Co. Real Property Tax Agency.
Wetlands are per flags placed by Lawler, Matusky & Skelly Engineers, LLP.
Basemap developed from Spectra Engineering, P.C. and LMS Engineers, LLP drawings.

Approximate Scale
0 200' 400'

GROUNDWATER SCIENCES CORPORATION
21003-064-C / 07-31-03



★ - Pump Test Well
▼ - Bedrock Test Well
▲ - Sand & Gravel Observation Well
● - Residential/Commercial Supply Well

- Bedrock Limit (approximate)
0.18 - Groundwater Elevation Drawdown (feet)
- Drawdown Elevation Contour (feet)

(TW-4AD pumping rate = 100 gpm)

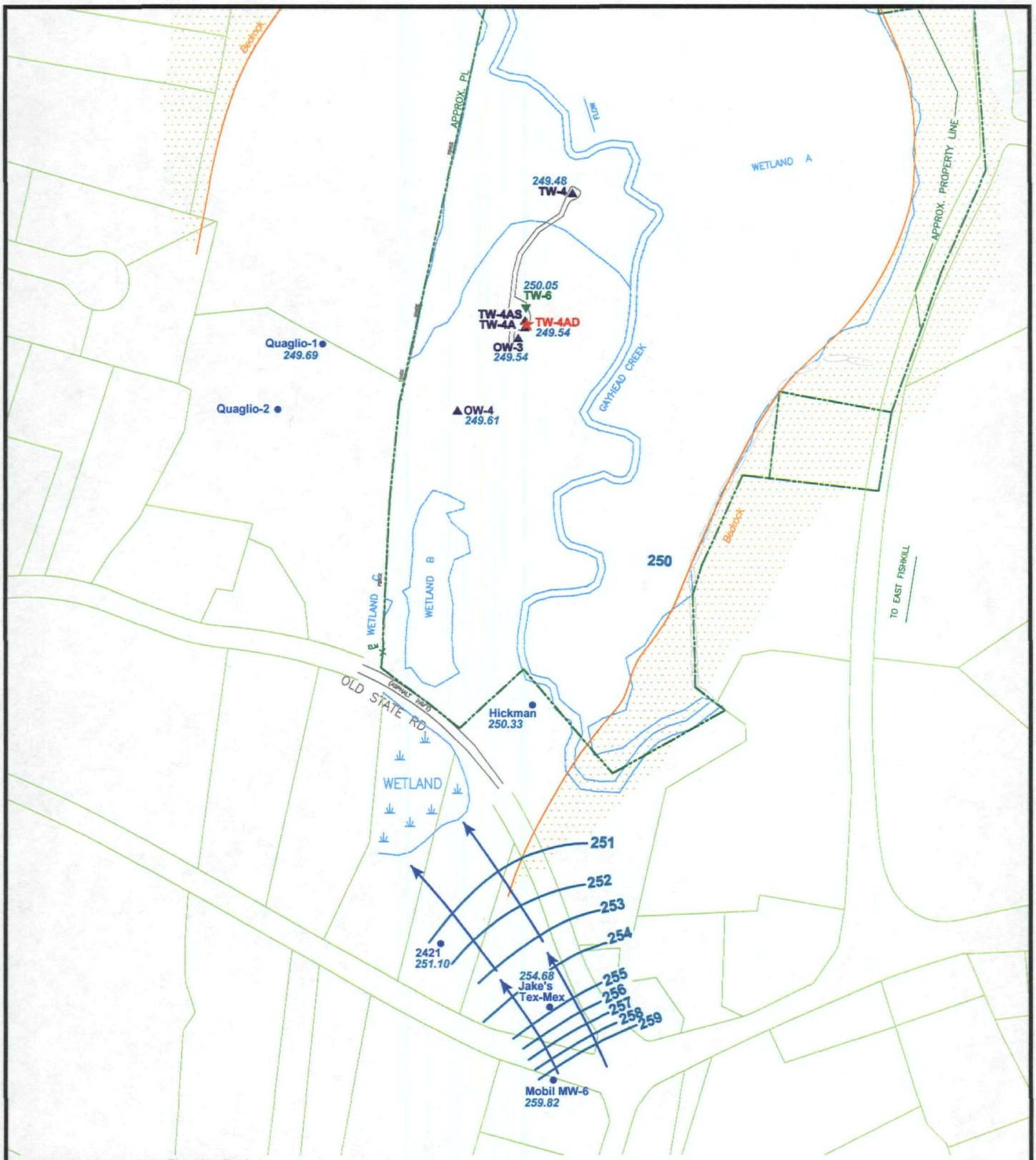
Property lines approximate; from Dutchess Co. Real Property Tax Agency.
Wetlands are per flags placed by Lawler, Matusky & Skelly Engineers, LLP.
Basemap developed from Spectra Engineering, P.C. and LMS Engineers, LLP drawings.

Approximate Scale
0 200' 400'

Figure 2-5

TW-4AD Pump Test #2, 72-Hour Drawdown Contour Map
Route 376 Properties, East Fishkill, NY
Alternate Water Supply Response

GROUNDWATER SCIENCES CORPORATION
21003-064-D / 07-31-03



259.82 - Groundwater Elevation (feet)
- Groundwater Elevation Contour (feet)
- Inferred Direction of Groundwater Flow
- Pump Test Well
- Bedrock Test Well
- Sand & Gravel Observation Well
- Residential/Commercial Supply Well

Approximate Scale
0 150' 300'

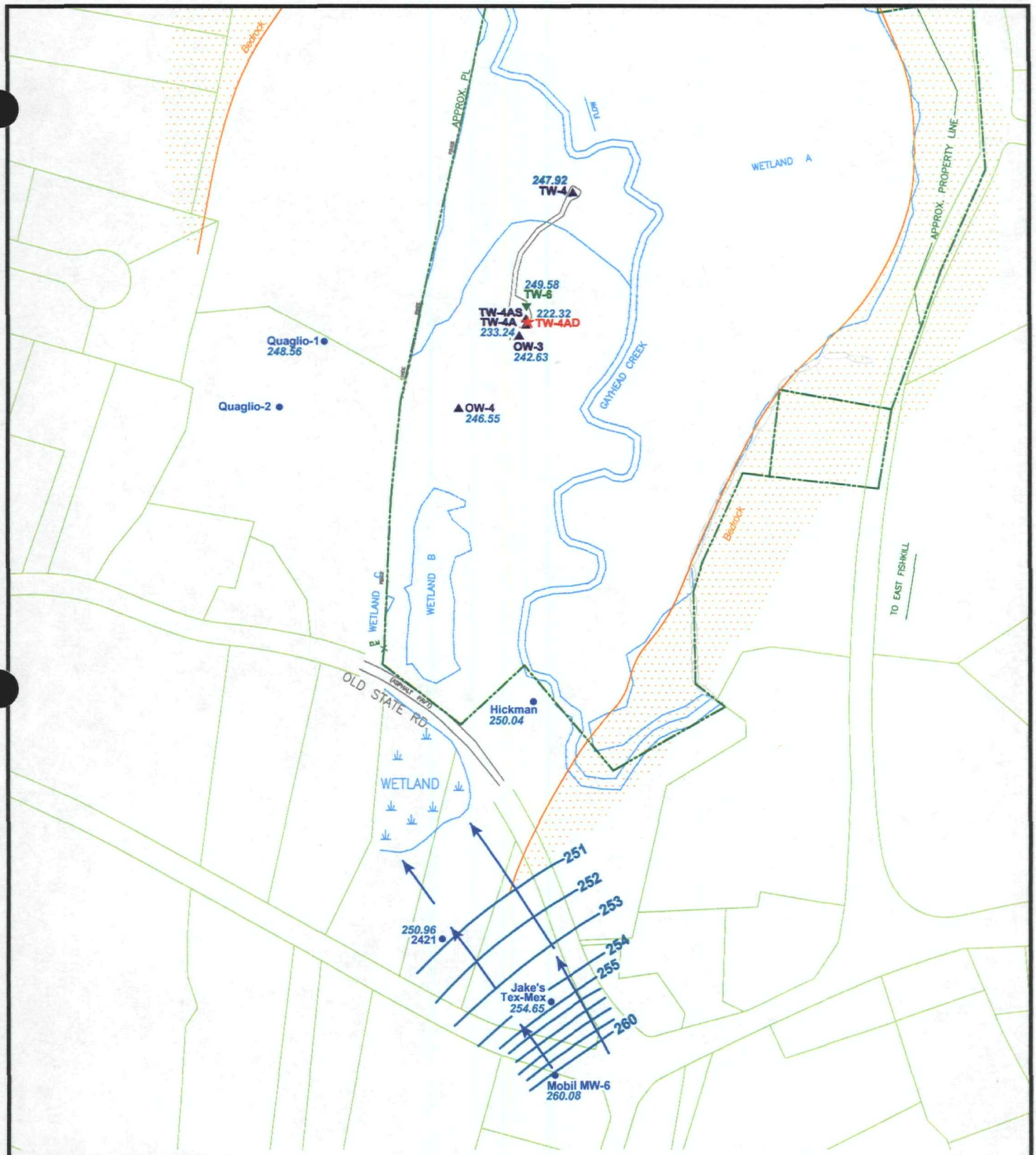
Property lines approximate; from Dutchess Co. Real Property Tax Agency.
Wetlands are per flags placed by Lawler, Matusky & Skelly Engineers, LLP.

Basemap developed from Spectra Engineering, P.C. and LMS Engineers, LLP drawings.

Figure 2-6
Groundwater Elevation Contour Map
TW-4AD #2 - Static Conditions, June 2, 2003; 02:00
Route 376 Properties, East Fishkill, NY

GROUNDWATER SCIENCES CORPORATION

21003-065-A / 07-31-03



259.82 - Groundwater Elevation (feet)
- Groundwater Elevation Contour (feet)
- Inferred Direction of Groundwater Flow
- Pump Test Well
- Bedrock Test Well
- Sand & Gravel Observation Well
- Residential/Commercial Supply Well

Approximate Scale
0 150' 300'

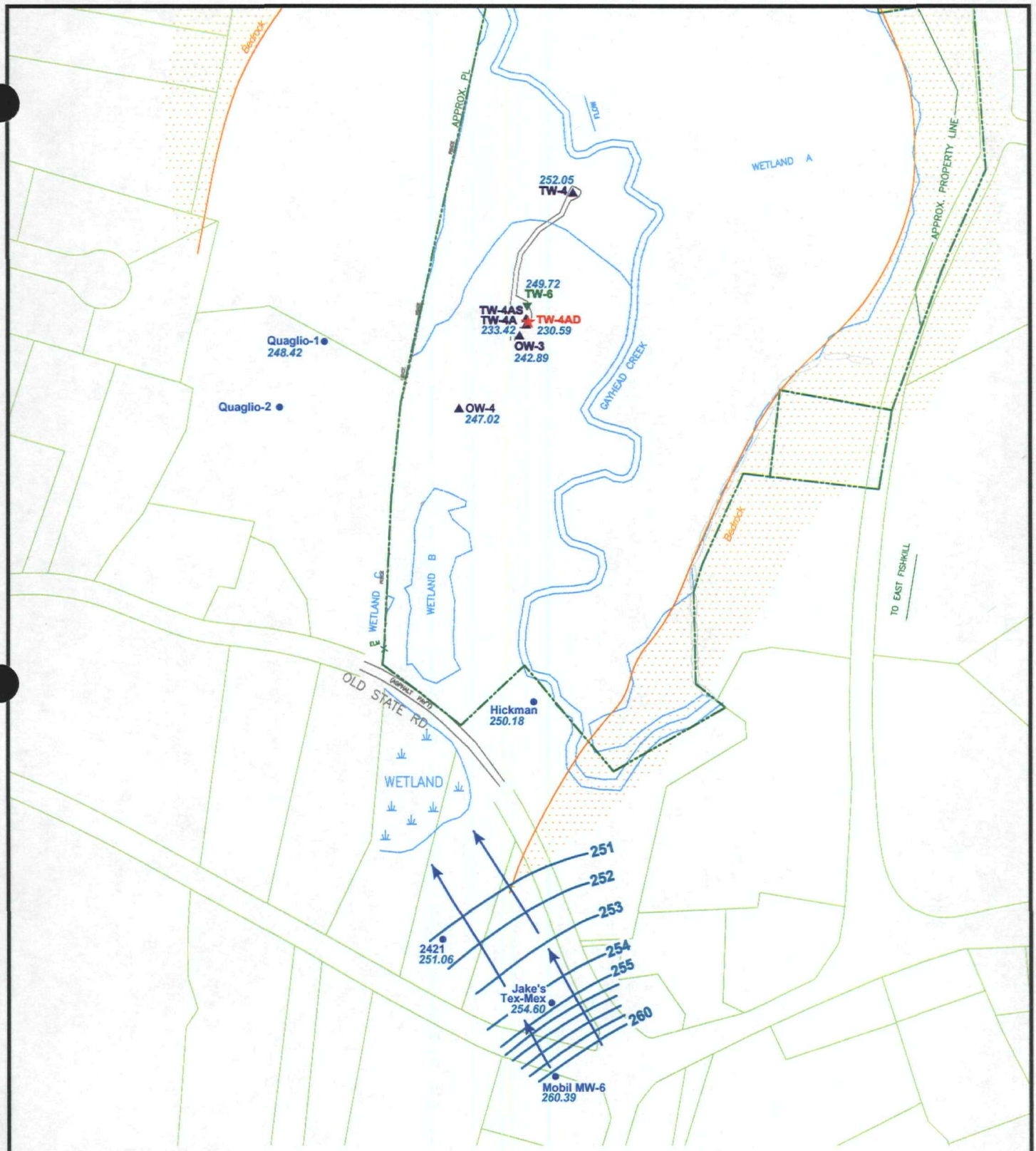
Property lines approximate; from Dutchess Co. Real Property Tax Agency.
Wetlands are per flags placed by Lawler, Matusky & Skelly Engineers, LLP.

Basemap developed from Spectra Engineering, P.C. and LMS Engineers, LLP drawings.

Figure 2-7
Groundwater Elevation Contour Map
TW-4AD #2 - Mid-Test, June 4, 2003; 03:00
Route 376 Properties, East Fishkill, NY

GROUNDWATER SCIENCES CORPORATION

21003-065-B / 07-31-03



260.39 - Groundwater Elevation (feet)
- Groundwater Elevation Contour (feet)
- Inferred Direction of Groundwater Flow
★ - Pump Test Well
▼ - Bedrock Test Well
▲ - Sand & Gravel Observation Well
● - Residential/Commercial Supply Well

Approximate Scale
0 150' 300'

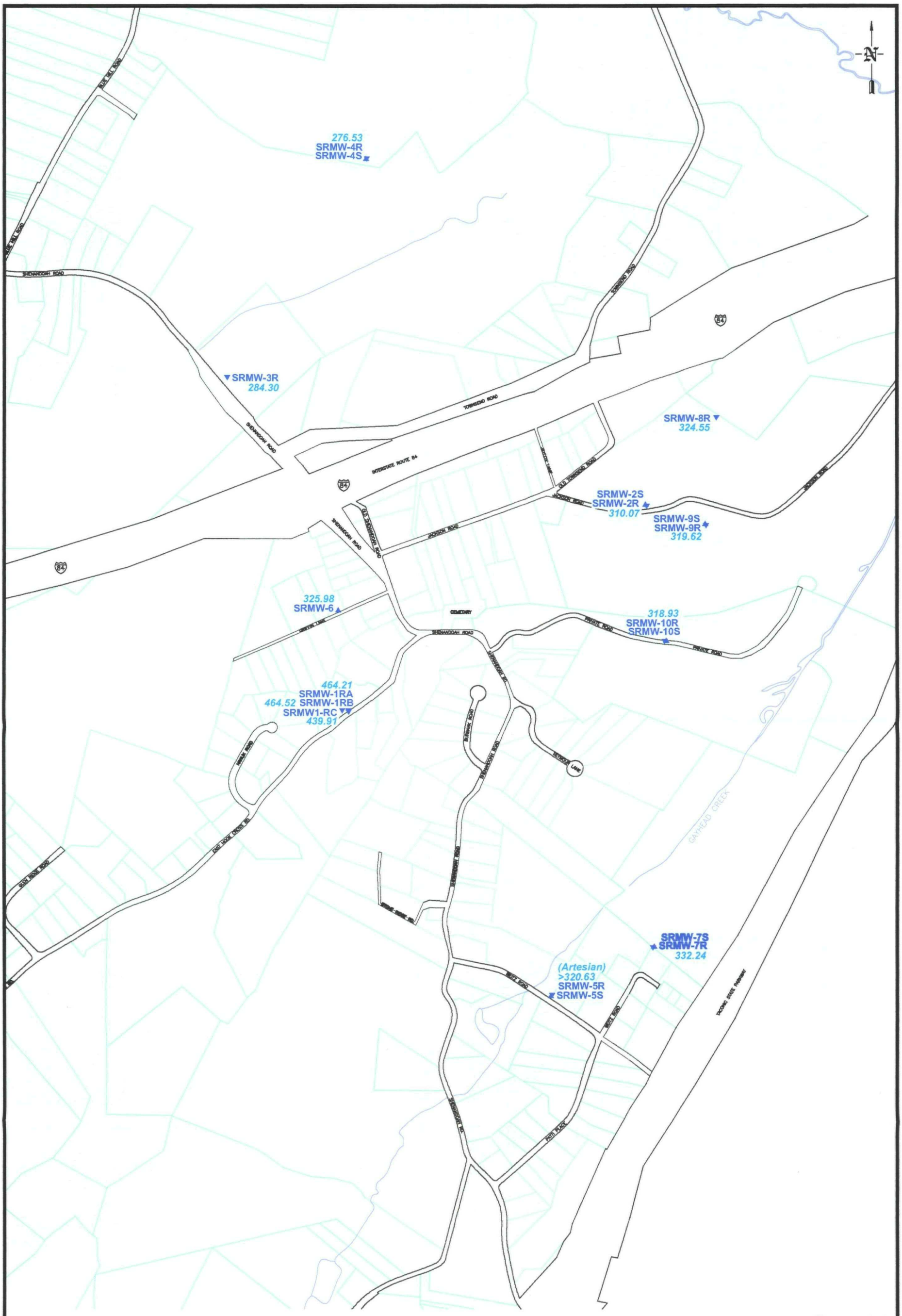
Property lines approximate; from Dutchess Co. Real Property Tax Agency.
Wetlands are per flags placed by Lawler, Matusky & Skelly Engineers, LLP.

Basemap developed from Spectra Engineering, P.C. and LMS Engineers, LLP drawings.

Figure 2-8
Groundwater Elevation Contour Map
TW-4AD #2 - End of Test, June 6, 2003; 08:45
Route 376 Properties, East Fishkill, NY

GROUNDWATER SCIENCES CORPORATION

21003-065-C / 07-31-03



332.24 - Groundwater Elevation (feet, July 23, 2003)

Approximate Scale
0 400' 800'

Parcels source: Geographic Information Systems Lab, Dutchess County Real Property Tax Service Agency, Poughkeepsie, NY; 5/98 (PROPERTIES NOT TO SCALE).

Figure 2-9
Monitoring Well Location Map
Shenandoah Road Groundwater Contamination Superfund Site
Alternate Water Supply Response Action, Final Response Scope

GROUNDWATER SCIENCES CORPORATION
21003-066-A / 09-18-03

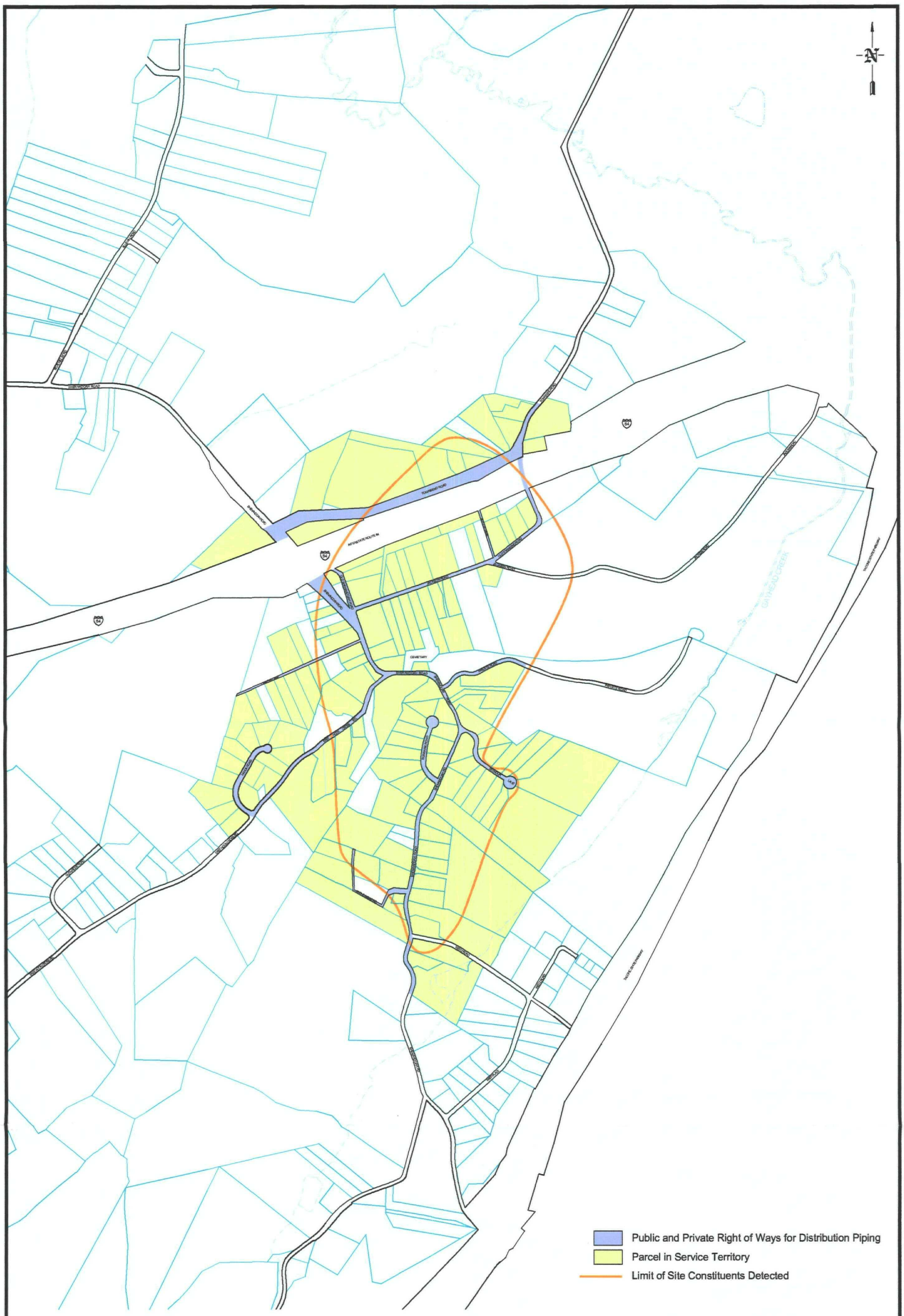


Figure 3-1

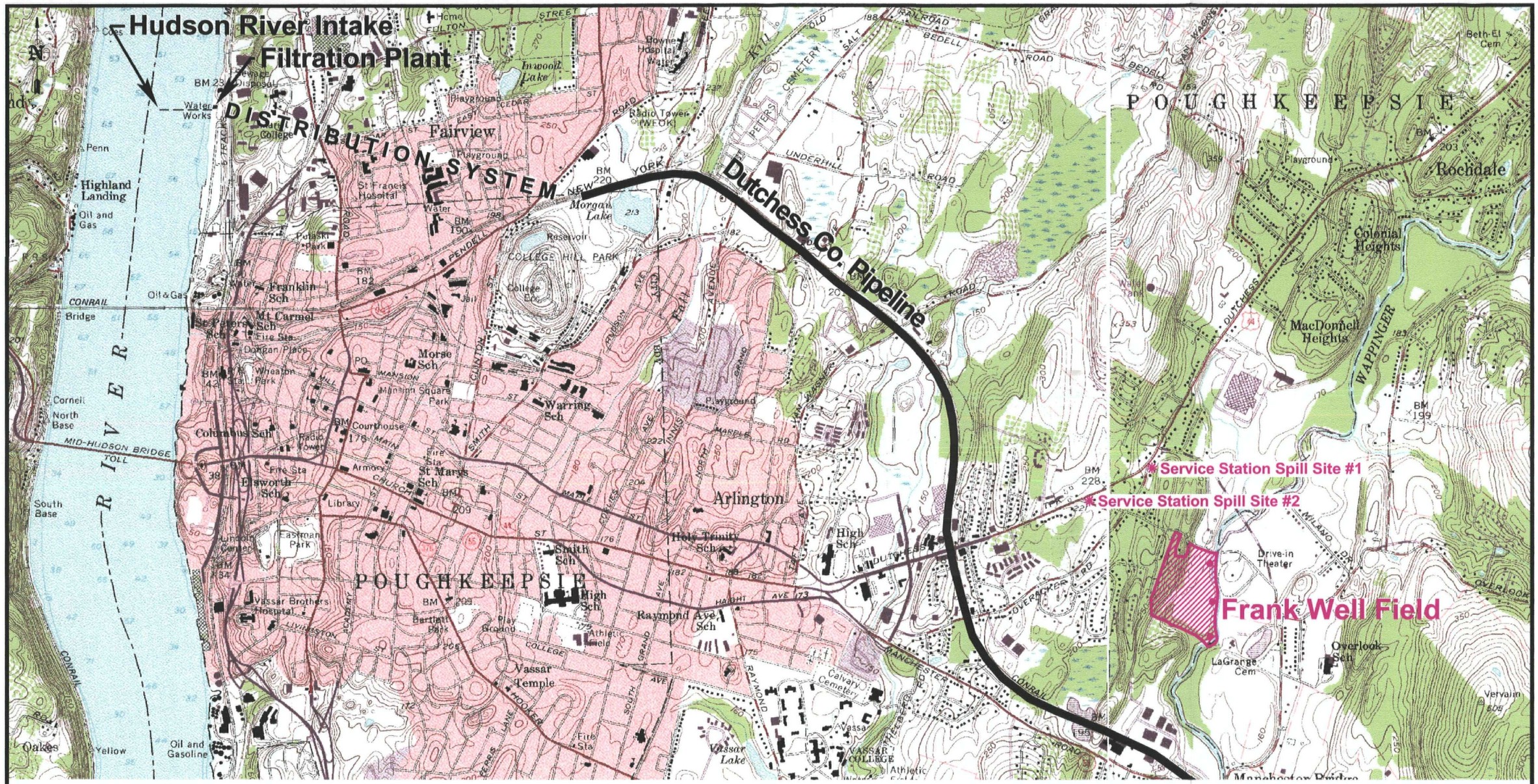
Shenandoah Road Groundwater Contamination Superfund Site
Potential Sources of Alternate Water Supply
Response Scope, Service Territory and Distribution System

Approximate Scale
0 500' 1000'

Parcels source: Geographic Information Systems Lab, Dutchess County Real Property Tax Service Agency, Poughkeepsie, NY; 5/98 (PROPERTIES NOT TO SCALE).

GROUNDWATER SCIENCES CORPORATION

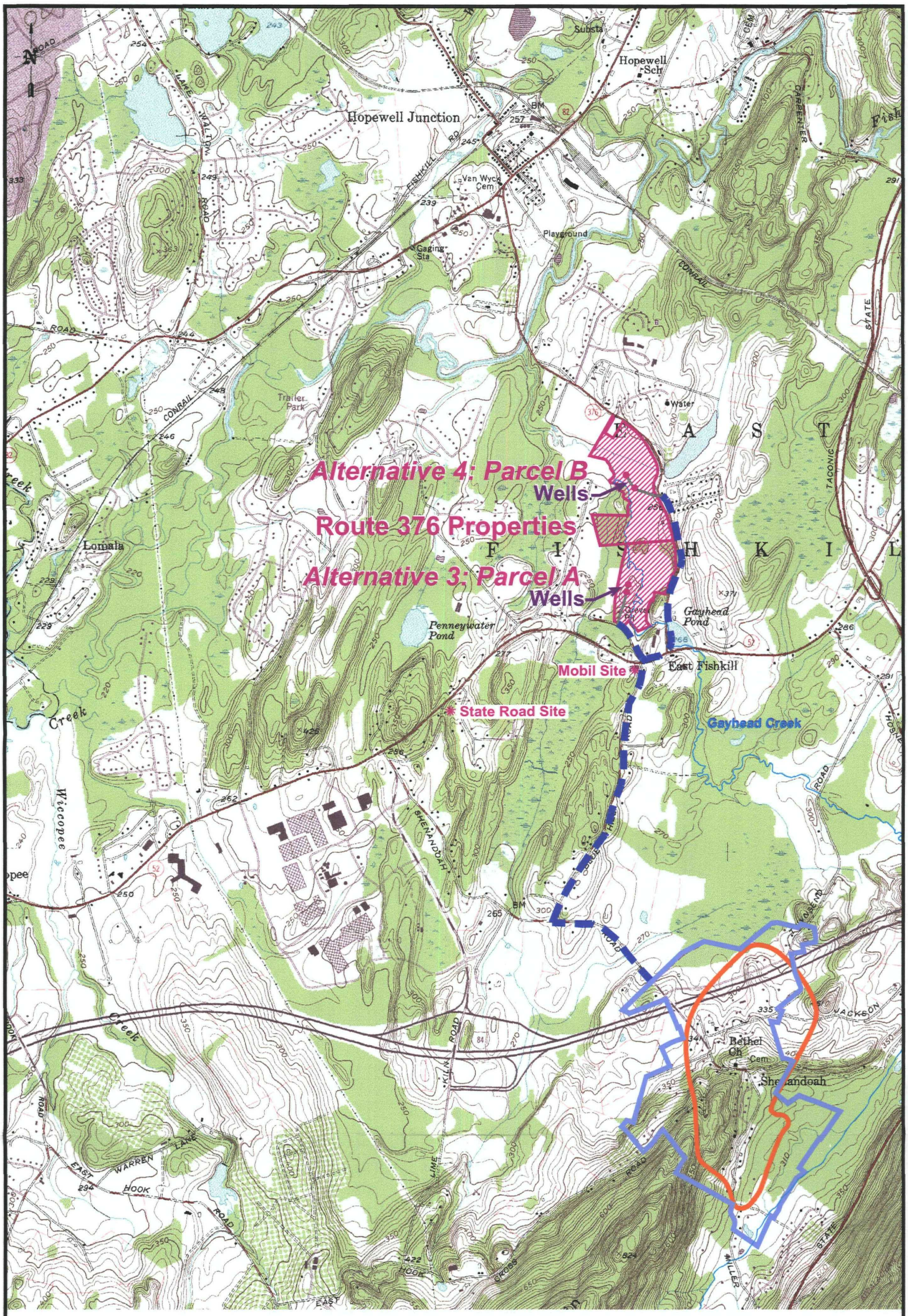
21003-053-C5 / 07-31-03



● – Water Supply Well

Figure 3-3
Shenandoah Road Groundwater Contamination Superfund Site
Potential Sources of Alternate Water Supply
Alternative 2: Dutchess County Pipeline

GROUNDWATER SCIENCES CORPORATION
21003-007-E3 / 07-16-03



● – Water Supply Well

– Transmission Piping Route

– Limit of Response Scope/Distribution System

– Limit of Site Constituents Detected

Approximate Scale
0 1000' 2000'

Figure 3-4

Shenandoah Road Groundwater Contamination Superfund Site
Potential Sources of Alternate Water Supply
Alternatives 3 & 4: Route 376 Properties

GROUNDWATER SCIENCES CORPORATION

21003-007-E5 / 09-18-03

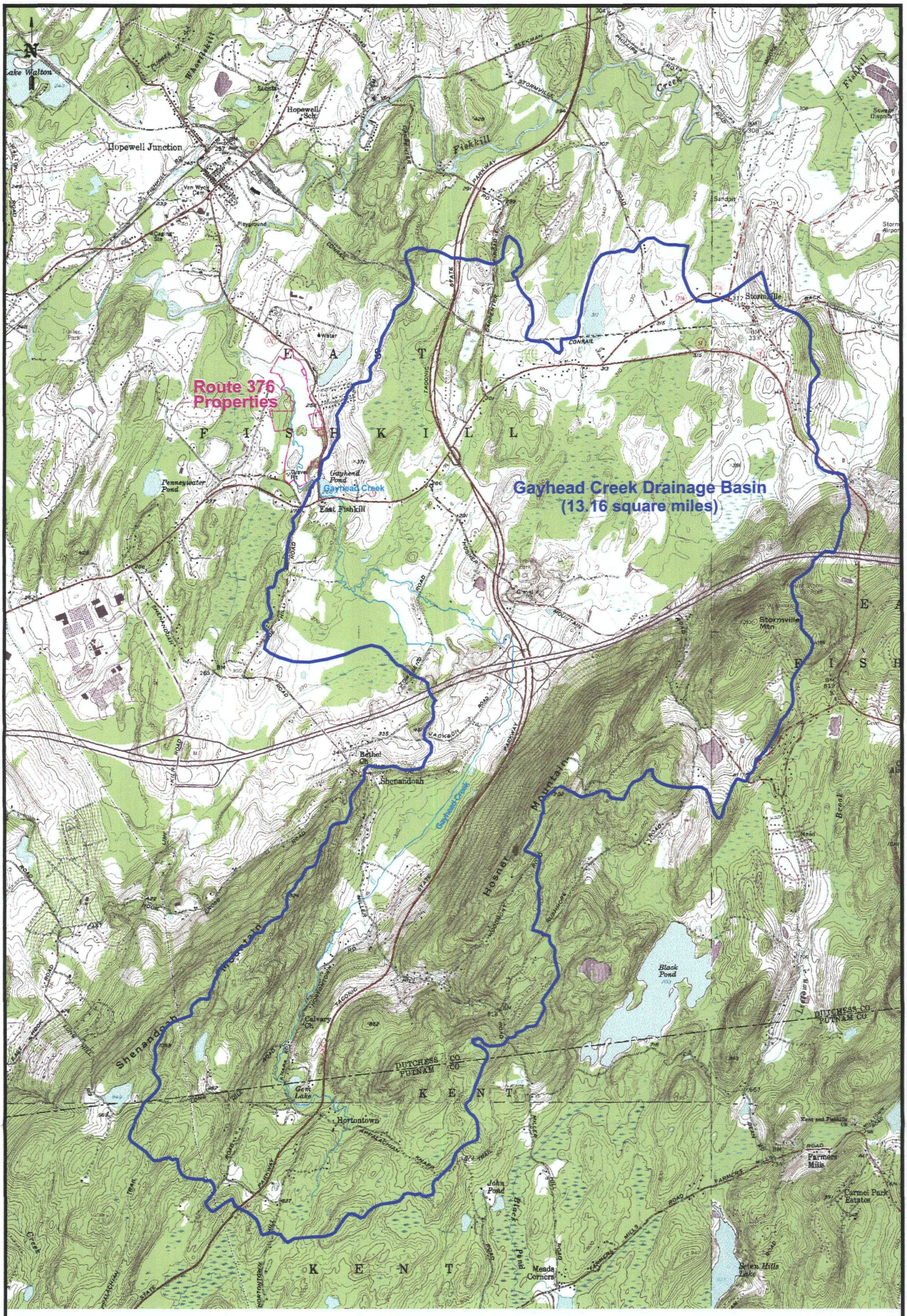


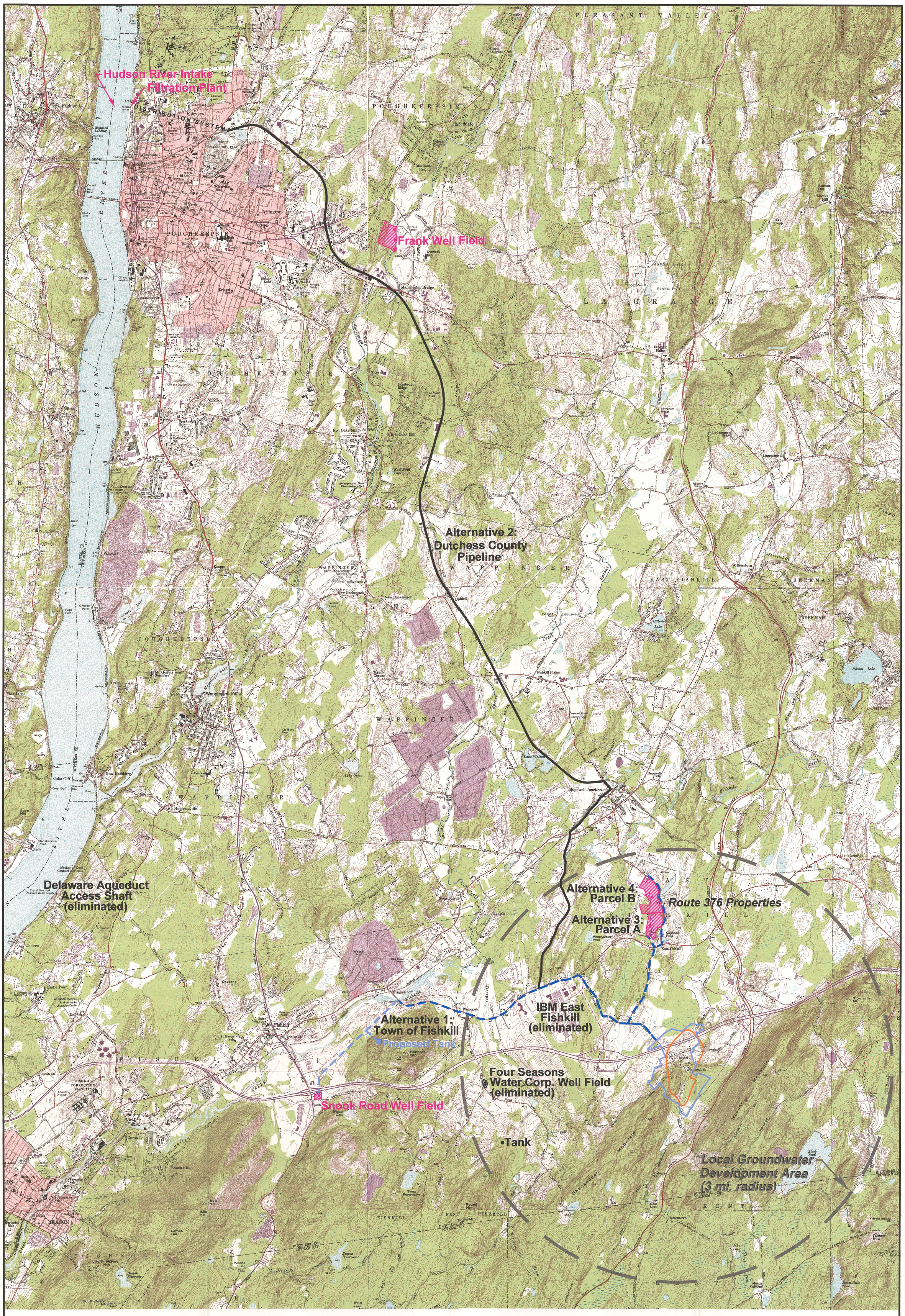
Figure 3-5

Drainage Area of Gayhead Creek above Gayhead Pond
Route 376 Properties, East Fishkill, NY
Alternate Water Supply Response

Property lines approximate; from Dutchess Co. Real Property Tax Agency.
Wetlands are per flags placed by Lawler, Matusky & Skelly Engineers, LLP.
Basemap developed from Spectra Engineering, P.C. and LMS Engineers, LLP drawings.

Approximate Scale
0 1500' 3000'

GROUNDWATER SCIENCES CORPORATION
21003-067-A / 09-18-03



- Transmission Piping Route
- Limit of Response Scope/Distribution System
- Limit of Site Constituents Detected
- Alternate Water Supply Source Alternative
- Water Supply Well

Scale
0 1500' 3000'

Plate 1

Shenandoah Road Groundwater Contamination Superfund Site
Potential Sources of Alternate Water Supply

GROUNDWATER SCIENCES CORPORATION

21003-007-G / 07-31-03

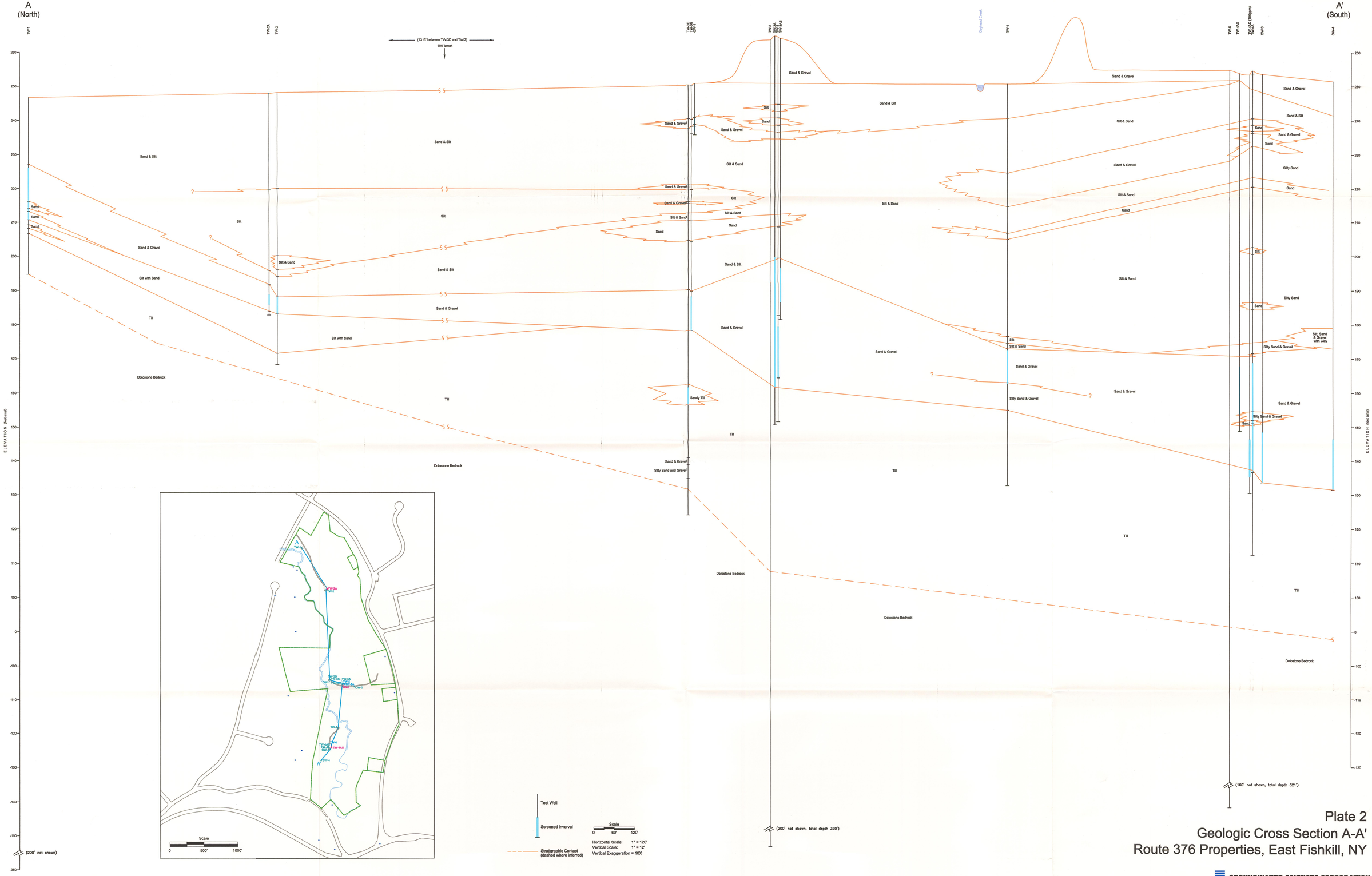


Plate 2
Geologic Cross Section A-A'
Route 376 Properties, East Fishkill, NY

GROUNDWATER SCIENCES CORPORATION

1003-CS08 / 09-18-03

APPENDIX A

DOCUMENTATION FOR THE TOWN OF FISHKILL ALTERNATIVE

Water Quality Data, Snook Road Well Field

WaterTest
CORPORATION OF AMERICA
33 South Commercial Street
Manchester, NH 03101
603-623-7400

Cat. # H037 : Selenium

CUSTOMER	SOURCE
DUNN GEOSCIENCE CORP	SNOOK ROAD SITE
MICHAEL PALLESCHI	TOWN OF FISHKILL
12 METRO PARK RD	WELLHEAD
ALBANY NY 12205	FISHKILL NY

PHONE # : 5184581313
Date Sampled : 12-may-1989
Date Reported : 15-JUN-1989

COMMENT: WELL DISCHARGE LINE

Sample Number : 067559

ANALYTE	MCL		RESULT
Selenium	0.010	<	0.002

RECEIVED
JUN 21 1989
DUNN GEOSCIENCE CORPORATION

All results in milligram/liter except Radon (pCi/L), pH (pH units) and Total coliform counts (CFU/100 mls, Colony Forming Units/100 milliliters). Analytes greater than MCL are marked with double asterisks on either side of the results.

1989 WATERTEST CORPORATION OF AMERICA

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Water Test Corporation

Sample Number: 891259.3

Analysis Requested: Herbicides

Date Received: 05/17/89

Date Reported: 05/31/89

Client Ident: 067544
Sample Location:
Sample Description: Water
Sample Container: Glass bottle
Field Prep: None

# of Containers: 1

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Herbicides	ND	ug/L	0.25	GC	1	8150	------	05/31/89

A list of herbicides analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results)
** REF--Reference as cited on the cover (first) page of this report.

WaterTest
CORPORATION OF AMERICA
33 South Commercial Street
Manchester, NH 03101
603-623-7400

Cat. # H067 : Color, Odor, Turbid.

27

CUSTOMER	SOURCE
DUNN GEOSCIENCE CORP	SNOOK ROAD SITE
MICHAEL PALLESCHI	TOWN OF FISHKILL NY
12 METRO PARK RD	WELLHEAD
ALBANY NY 12205	FISHKILL NY

PHONE # : 5184581313
Date Sampled : 12-may-1989
Date Reported : 26-MAY-1989

COMMENT: DISCHARGE LINE

Sample Number : 067549

ANALYTE	MCL		RESULT
Turbidity	1.000		0.000
Color	15.000	<	1.000
Odor	None		0.000

RECEIVED
JUN 2 1989
DUNN GEOSCIENCE CORPORATION

All results in milligram/liter except Radon (pCi/L), pH (pH units) and Total coliform counts (CFU/100 mls: Colony Forming Units/100 milliliters). Analytes greater than MCL are marked with double asterisks on either side of the results.

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WaterTest
CORPORATION OF AMERICA
33 South Commercial Street
Manchester, NH 03101
603-623-7400

CUSTOMER	SOURCE
DUNN GEOSCIENCE CORP	TOWN OF FISHKILL
MICHAEL D PALLESCHI	SNOOK ROAD SITE
12 METRO PARK RD	SAMPLE TAKEN FROM
ALBANY NY 12205	WELL DISCHARGE L

PHONE # : 5184581313

DATE REPORTED : 8-JUN-1989 KIT SERIAL # : 050583

ANALYTE	MCL		RESULT
Dibromochloromethane	0.1000	<	0.0005
Bromoform	0.1000	<	0.0001
Benzene	0.0050	<	0.0001
Bromobenzene	0.0000	<	0.0005
Bromochlormethane	0.0000	<	0.0002
Bromomethane	0.0000	<	0.0005
n-Butylbenzene	0.0000	<	0.0003
sec-Butylbenzene	0.0000	<	0.0001
tert-Butylbenzene	0.0000	<	0.0002
Carbon Tetrachloride	0.0050	<	0.0005
Chlorobenzene	0.4880	<	0.0001
Chloroethane	0.0000	<	0.0005
Chloromethane	0.0000	<	0.0005
2-Chlorotoluene	0.0000	<	0.0002
4-Chlorotoluene	0.0000	<	0.0002
1,2-Dibromo-3-chloropropane	0.0000	<	0.0005
1,2-Dibromoethane	0.0000	<	0.0005
Dibromomethane	0.0000	<	0.0001
1,2-Dichlorobenzene	0.0620	<	0.0002
1,3-Dichlorobenzene	0.0000	<	0.0002
1,4-Dichlorobenzene	0.0750	<	0.0001
Dichlorodifluoromethane	0.0000	<	0.0005
1,1-Dichloroethane	0.0000	<	0.0002
1,2-Dichloroethane	0.0050	<	0.0001
1,1-Dichloroethylene	0.0070	<	0.0001
trans-1,2-Dichloroethylene	0.0000	<	0.0001
cis-1,2-Dichloroethylene	0.0000	<	0.0005
1,2-Dichloropropane	0.0060	<	0.0004
1,3-Dichloropropane	0.0000	<	0.0002
2,2-Dichloropropane	0.0000	<	0.0002
1,1-Dichloropropane	0.0000	<	0.0005

All results in milligram/liter except Radon (pCi/L), pH (pH units) and Total coliform counts (CFU/100 mls, Colony Forming Units/100 milliliters). Analytes greater than MCL are marked with double asterisks on either side of the results.

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WaterTest
CORPORATION OF AMERICA
33 South Commercial Street
Manchester, NH 03101
603-623-7400

Cat. # H054 : Pesticides/PCBs

CUSTOMER	SOURCE
DUNN GEOSCIENCE CORP	TOWN FO FISHKILL
MICHAEL D PALLESCHI	SNOOK ROAD SITE
12 METRO PARK RD	SAMPLE TAKEN FROM
ALBANY NY 12205	WELL DISCHARGE L

PHONE # : 5184581313
Date Sampled : 12-may-1989
Date Reported : 16-MAY-1989

Sample Number : 050585

ANALYTE	MCL		RESULT
Alachlor	0.0000	<	0.0004
Aldrin	0.0000	<	0.0001
Chlordane	0.0000	<	0.0004
Dieldrin	0.0000	<	0.0002
Endrin	0.0020	<	0.0002
Heptachlor	0.0000	<	0.0004
Heptachlor Epoxide	0.0000	<	0.0002
Hexachlorobenzene	0.0000	<	0.0003
Lindane	0.0040	<	0.0002
Methoxychlor	0.1000	<	0.0002
Toxaphene	0.0050	<	0.0020
Aroclor 1016	0.0000	<	0.0006
Aroclor 1221	0.0000	<	0.0020
Aroclor 1232	0.0000	<	0.0020
Aroclor 1242	0.0000	<	0.0006
Aroclor 1248	0.0000	<	0.0007
Aroclor 1254	0.000	<	0.001
Aroclor 1260	0.000	<	0.001

RECEIVED
MAY 30 1989
DUNN GEOSCIENCE CORPORATION

All results in milligram/liter except Radon (pCi/L), pH (pH units) and Total coliform counts (CFU/100 mls, Colony Forming Units/100 milliliters). Analytes greater than MCL are marked with double asterisks on either side of the results.

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OCL Analytical Services
35 Goshen Turnpike
Bloomingburg, NY 12721

(914) 733-1557 Fax: (914)733-1944

ELAP#10510

OCL
Analytical Services

Tuesday, November 07, 2000
Page Number : 1
QCL Sample No: 100687

LBG, INC.
126 Monroe TPK.
Trumball CT 06611

Client Code : CUSACK

OCL Sample No : 100687

System Name : LBG
Exact Location : T-1

Date Collected : 11/2/00
Time Collected :
Date Received : 11/2/00

Submit By : J. ZLELL

Type Descr : SID : 000 Fed ID :

Analysis		Result	Units	MCL/DL		Method	Lab	Date	By
Total Coliform		absence				9223B	10510	11/2/00	HH
E.coli		absence				9223B	10510	11/2/00	HH

This sample passes NYSDOH and EPA drinking water standards

Remarks :

Copies to:

GT = greater than
LT = less than
ND = not detected

MCL = maximum contaminant level
DL = detection level

H Halle
Microbiology Department

OCL Analytical Services
35 Goshen Turnpike
Bloomingburg, NY 12721

(914) 733-1557 Fax: (914)733-1944

ELAP#10510

OCL
Analytical Services

Wednesday, November 29, 2000
Page Number: 1
OCL Sample No: 100687

LBG, INC.
126 Monroe TPK.
Trumball CT 06611

Client Code: CUSACK

OCL Sample No: 100687

System Name: LBG
Exact Location: T-1

Date Collected: 11/2/00
Time Collected:
Date Received: 11/2/00

Submit By: J. ZLELL

Type Descr: SID: 000 Fed ID:

Analysis		Result	Units	MCL/DL		Method	Lab	Date	By
Chloride		103	mg/L	250	MCL	4500CLB	10510	11/6/00	
Color	LT	5				2120	10510	11/2/00	JJ
Alkalinity as CaCO3		155	mg/L			EPA 1664	10510	11/3/00	LM
Calcium Hardness as CaCO3		163	mg/L			3500CaD	10510	11/2/00	JJ
pH		7.15				4500H	10510	11/2/00	JJ
Corrosivity		-0.496				2330	10510	11/7/00	GM
Fluoride	LT	0.20	mg/L	2.2	MCL	340.2	10510	11/7/00	GM
Nitrate as N		1.45	mg/L	10	MCL	Lachat	10510	11/7/00	GM
Odor		NONE				2150	10510	11/2/00	JJ
TDS		433	mg/L			2540C	10510	11/2/00	JJ
Sulfate		37.9	mg/L	250	MCL	375.4	10510	11/6/00	JJ
Turbidity		0.133	ntu			2130	10510	11/2/00	JJ

Remarks: Amended Report

Copies to:

GT = greater than
LT = less than
ND = not detected

MCL = maximum contaminant level
DL = detection level

Inorganic Chemistry Department

OCL Analytical Services
35 Goshen Turnpike
Bloomingburg, NY 12721

(914) 733-1557 Fax: (914)733-1944

ELAP#10510

OCL
Analytical Services

Wednesday, November 22, 2000
Page Number : 1
OCL Sample No: 100687

LBG, INC.
126 Monroe TPK.
Trumball CT 06611

Client Code : CUSACK

OCL Sample No : 100687

System Name : LBG
Exact Location : T-1

Date Collected : 11/2/00
Time Collected :
Date Received : 11/2/00

Submit By : J. ZLELL

Type Descr : SID : 000 Fed ID :

Analysis		Result	Units	MCL/DL		Method	Lab	Date	By
Cyanide, Total	ND	<0.015	mg/L	0.2	MCL	Lachat	11216	11/10/00	CEH
Total Petroleum Hydrocarbons	ND	<5	mg/L			EPA 1664	11216	11/6/00	BH
Lead, total	ND	<0.001	mg/L	0.015	MCL	EPA 200.9	11216	11/6/00	SDC
Silver, total	ND	<0.01	mg/L	0.1	MCL	EPA 200.7	11216	11/10/00	SDC
Copper, total	ND	<0.005	mg/L	1.3	MCL	EPA 200.7	11216	11/7/00	SDC
Iron, total	ND	<0.05	mg/L	0.3	MCL	EPA 200.7	11216	11/10/00	SDC
Sodium, total		80.9	mg/L			EPA 200.7	11216	11/10/00	SDC
Zinc, total		0.05	mg/L	5.0	MCL	EPA 200.7	11216	11/7/00	SDC
Manganese, total	ND	<0.002	mg/L	0.3	MCL	EPA 200.7	11216	11/7/00	SDC
Benzene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Bromobenzene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Bromochloromethane	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Bromomethane	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
n-Butylbenzene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
sec-Butylbenzene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
tert-Butylbenzene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Carbon Tetrachloride	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Chlorobenzene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Chloroethane	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Chloromethane	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
2-Chlorotoluene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
4-Chlorotoluene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Dibromomethane	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
1,2-Dichlorobenzene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
1,3-Dichlorobenzene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
1,4-Dichlorobenzene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Dichlorodifluoromethane	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
1,1-Dichloroethane	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
1,2-Dichloroethane	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	

GT = greater than
LT = less than
ND = not detected

MCL = maximum contaminant level
DL = detection level

David M. Kennedy - Director

OCL Analytical Services
35 Goshen Turnpike
Bloomingburg, NY 12721

(914) 733-1557 Fax: (914)733-1944

ELAP#10510

OCL
Analytical Services

Wednesday, November 22, 2000
Page Number : 2
OCL Sample No: 100687

Analysis		Result	Units	MCL/DL		Method	Lab	Date	By
1,1-Dichloroethene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
cis-1,2-Dichloroethene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
trans-1,2-Dichloroethene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
1,2-Dichloropropane	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
1,3-Dichloropropane	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
2,2-Dichloropropane	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
1,1-Dichloropropene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
cis-1,3-Dichloropropene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
trans-1,3-Dichloropropene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Ethylbenzene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Hexachlorobutadiene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Isopropylbenzene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
p-Isopropyltoluene (p-cymene)	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Methylene Chloride	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
n-Propylbenzene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Styrene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
1,1,1,2-Tetrachloroethane	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
1,1,2,2-Tetrachloroethane	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Tetrachloroethene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Toluene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
1,2,3-Trichlorobenzene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
1,2,4-Trichlorobenzene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
1,1,1-Trichloroethane	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
1,1,2-Trichloroethane	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Trichloroethene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Trichlorofluoromethane	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
1,2,3-Trichloropropane	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
1,2,4-Trimethylbenzene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
1,3,5-Trimethylbenzene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
p/m-Xylene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
o-Xylene	ND	<0.5	ug/L	5.0	MCL	EPA 524.2	10248	11/12/00	
Vinyl Chloride	ND	<0.5	ug/L	2.0	MCL	EPA 524.2	10248	11/12/00	
Methyl tert butyl ether	ND	<0.5	ug/L			EPA 524.2	10248	11/12/00	
Aldicarb	ND	<1.6	ug/L	3	MCL	EPA 531.1	11216	11/9/00	IC
Aldicarb Sulfone	ND	<1.0	ug/L	2	MCL	EPA 531.1	11216	11/9/00	IC
Aldicarb Sulfoxide	ND	<0.4	ug/L	4	MCL	EPA 531.1	11216	11/9/00	IC
Carbofuran	ND	<0.4	ug/L	40	MCL	EPA 531.1	11216	11/9/00	IC
Oxamyl (vydate)	ND	<0.8	ug/L	200	MCL	EPA 531.1	11216	11/9/00	IC
Methomyl	ND	<0.7	ug/L		MCL	EPA 531.1	11216	11/9/00	IC
3-Hydroxycarbofuran	ND	<1.7	ug/L		MCL	EPA 531.1	11216	11/9/00	IC
Carbaryl	ND	<0.6	ug/L		MCL	EPA 531.1	11216	11/9/00	IC
Diquat	ND	<0.8	ug/L	20	MCL	EPA 549.2	11216	11/9/00	IC
Glyphosate	ND	<7.0	ug/L	700.0	MCL	EPA 547	11216	11/6/00	IC
Endothall	ND	<5.0	ug/L	100.0	MCL	EPA 548.1	11072	11/10/00	DR
Ethylene dibromide (1,2-Dibromoethane)	ND	<0.01	ug/L	0.05	MCL	EPA 504.1	11216	11/14/00	KG
1,2-Dibromo-3-chloropropane (DBCP)	ND	<0.01	ug/L	0.20	MCL	EPA 504.1	11216	11/14/00	KG
Toxaphene	ND	<0.28	ug/L	3.00	MCL	EPA 508	11216	11/15/00	RC
PCB 1016	ND	<0.10	ug/L			EPA 508	11216	11/15/00	RC

GT = greater than
LT = less than
ND = not detected

MCL = maximum contaminant level
DL = detection level

David M. Kennedy - Director

OCL Analytical Services
35 Goshen Turnpike
Bloomingburg, NY 12721

(914) 733-1557 Fax: (914)733-1944

ELAP#10510

OCL
Analytical Services

Wednesday, November 22, 2000
Page Number : 3
OCL Sample No: 100687

Analysis		Result	Units	MCL/DL		Method	Lab	Date	By
PCB 1221	ND	<0.10	ug/L			EPA 508	11216	11/15/00	RC
PCB 1232	ND	<0.10	ug/L			EPA 508	11216	11/15/00	RC
PCB 1242	ND	<0.10	ug/L			EPA 508	11216	11/15/00	RC
PCB 1248	ND	<0.10	ug/L			EPA 508	11216	11/15/00	RC
PCB 1254	ND	<0.10	ug/L			EPA 508	11216	11/15/00	RC
PCB 1260	ND	<0.10	ug/L			EPA 508	11216	11/15/00	RC
Chlordane	ND	<0.05	ug/L	2.0	MCL	EPA 508	11216	11/15/00	RC
Surrogate Recovery(b-BHC)		103.7	Perce			EPA 508	11216	11/15/00	RC
2,4-D	ND	<10	ug/L	70.0	MCL	EPA 515.3	10248	11/15/00	
Dalapon	ND	<10	ug/L	50.0	MCL	EPA 515.3	10248	11/15/00	
Dicamba	ND	<10	ug/L	60.0	MCL	EPA 515.3	10248	11/15/00	
Dinoseb	ND	<1	ug/L	7.0	MCL	EPA 515.3	10248	11/15/00	
Pentachlorophenol	ND	<0.2	ug/L	1.0	MCL	EPA 515.3	10248	11/15/00	
Pichloram	ND	<0.2	ug/L	500.0	MCL	EPA 515.3	10248	11/15/00	
2,4,5-TP (Silvex)	ND	<2	ug/L	50.0	MCL	EPA 515.3	10248	11/15/00	
Alachlor	ND	<0.0004	ug/L	2.0	MCL	EPA 525.2	11216	11/17/00	
Aldrin	ND	<0.001	ug/L	5.0	MCL	EPA 525.2	11216	11/17/00	
Atrazine	ND	<0.0006	ug/L	3.0	MCL	EPA 525.2	11216	11/17/00	
Benzo(a)pyrene	ND	<0.0002	ug/L	0.2	MCL	EPA 525.2	11216	11/17/00	
Di(2-ethylhexyl) adipate	ND	<0.01	ug/L	400.0	MCL	EPA 525.2	11216	11/17/00	
Di(2-ethylhexyl) phthalate	ND	<0.001	ug/L	6.0	MCL	EPA 525.2	11216	11/17/00	
Butachlor	ND	<0.01	ug/L	50	MCL	EPA 525.2	11216	11/17/00	
Endrin	ND	<0.01	ug/L	2.0	MCL	EPA 525.2	11216	11/17/00	
Heptachlor	ND	<0.0001	ug/L	0.4	MCL	EPA 525.2	11216	11/17/00	
Heptachlor Epoxide	ND	<0.0001	ug/L	0.2	MCL	EPA 525.2	11216	11/17/00	
Hexachlorobenzene	ND	<0.0002	ug/L	1.0	MCL	EPA 525.2	11216	11/17/00	
Hexachlorocyclopentadiene	ND	<0.001	ug/L	50.0	MCL	EPA 525.2	11216	11/17/00	
Lindane	ND	<0.0001	ug/L	0.2	MCL	EPA 525.2	11216	11/17/00	
Methoxychlor	ND	<0.008	ug/L	40.0	MCL	EPA 525.2	11216	11/17/00	
Metolachlor	ND	<0.01	ug/L	50	MCL	EPA 525.2	11216	11/17/00	
Metribuzin	ND	<0.21	ug/L	50	MCL	EPA 525.2	11216	11/17/00	
Propachlor	ND	<0.01	ug/L	50	MCL	EPA 525.2	11216	11/17/00	
Simazine	ND	<0.0008	ug/L	4.0	MCL	EPA 525.2	11216	11/17/00	
Dieldrin	ND	<0.001	ug/L	5.0	MCL	EPA 525.2	11216	11/17/00	
Barium, Total		0.017	mg/L	2.00	MCL	EPA 200.7	11216	11/7/00	SDC
Cadmium, Total	ND	<0.002	mg/L	0.005	MCL	EPA 200.7	11216	11/7/00	SDC
Chromium, Total	ND	<0.004	mg/L	0.10	MCL	EPA 200.7	11216	11/7/00	SDC
Mercury, Total	ND	<0.0002	mg/L	0.002	MCL	EPA 245.1	11216	11/8/00	KAL
Mercury, Total	ND	<0.0002	mg/L	0.01	MCL	EPA 245.1	11216	11/8/00	KAL
Antimony, Total	ND	<0.005	mg/L	0.006	MCL	EPA 200.9	11216	11/10/00	SDC
Beryllium, Total	ND	<0.001	mg/L	0.004	MCL	EPA 200.7	11216	11/7/00	SDC
Nickel, Total		0.013	mg/L	0.1	MCL	EPA 200.7	11216	11/7/00	SDC
Thallium, Total	ND	<0.002	mg/L	0.002	MCL	EPA 200.9	11216	11/9/00	SDC

Remarks :

GT = greater than
LT = less than
ND = not detected

MCL = maximum contaminant level
DL = detection level

David M. Kennedy - Director

Hazen Research, Inc.
4601 Indiana Street • Golden, CO 80403
Tel: (303) 279-4501
Fax: (303) 278-1528

DATE	November 7, 2000
HRI PROJECT	009-456
HRI SERIES NO.	K052/00
DATE REC'D	11/03/2000
CUST. P.O.#	None Rec'd

OCL Analytical Services
David Kennedy
35 Goshen Turnpike
Bloomingburg, NY 12721

REPORT OF ANALYSIS

SAMPLE NO. K052/00-1

SAMPLE IDENTIFICATION: 100687 LBG, Inc., Trumbull, CT - sampled on 11/02/2000 @ 1130

PARAMETER	RESULT	DETECTION LIMIT	METHOD	ANALYSIS DATE	ANALYST
Radon (+-Precision*), pCi/l (T)	470(+-25)	11	SM 7500-Rn B	11/03/2000 @ 1240	EDF

*Variability of the radioactive decay process (counting error) at the 95% confidence level, 1.96 sigma.
Certification ID's: CO/EPA - CO00006; CT - PH-0152; KY - 90076; KS - E-10265; NH - 232800-A;
NY ELAP - 11417; PA DEP 68551; WI - 998376610

CODES:
(T) = Total (D) = Dissolved
(S) = Suspended (R) = Total Recoverable
(PD) = Potentially Dissolved
< = Less Than

By: Robert Rosiad
Laboratory Manager

Hazen Research, Inc.
4601 Indiana Street
Golden, CO 80403 USA
Tel: (303) 279-4801
Fax: (303) 278-1528

DATE	December 7, 2000
HRI PROJECT	009-456
HRI SERIES NO.	K205/00
DATE REC'D	11/10/2000
CUST. P.O.#	None Rec'd

OCL Analytical Services
David Kennedy
35 Goshen Turnpike
Bloomingburg, NY 12721

REPORT OF ANALYSIS

SAMPLE NO. K205/00-1

SAMPLE IDENTIFICATION: 100687 - T-1 - LBG, Inc. (Snook), Trumbull, CT - sampled on 11/02/2000

PARAMETER	RESULT	DETECTION LIMIT	METHOD	ANALYSIS DATE	ANALYST
Gross Alpha (+-Precision*), pCi/l (T)	0.0(+-2.1)	1.9	EPA 900.0	12/05/2000 @ 0751	MA
Gross Beta (+-Precision*), pCi/l (T)	1.8(+-1.9)	1.7	EPA 900.0	12/05/2000 @ 0751	MA
Radium-226 (+-Precision*), pCi/l (T)	0.0(+-0.2)	0.2	SM 7500-Ra B	11/24/2000 @ 0927	MA
Radium-228 (+-Precision*), pCi/l (T)	1.1(+-0.7)	0.6	EPA Ra-05	11/15/2000 @ 0034	RH

*Variability of the radioactive decay process (counting error) at the 95% confidence level, 1.96 sigma.
Certification ID's: CO/EPA - CO00008; CT - PH-0152; KY - 90076; KS - E-10265; NH - 232600-A;
NY ELAP - 11417; PA DEP 68551; WI - 998376610

CODES:
(T) = Total (D) = Dissolved
(S) = Suspended (R) = Total Recoverable
(PD) = Potentially Dissolved
< = Less Than

By: [signature]
Robert Rostad
Laboratory Manager

APPENDIX B

DOCUMENTATION FOR THE DUTCHESS COUNTY PIPELINE ALTERNATIVE

B-1: Water Quality Data, Frank Well Field

B-2: Service Station Spill Site #1 and Site #2

APPENDIX B-1

Water Quality Data, Frank Well Field

IBM HUDSON VALLEY ENVIRONMENTAL LABORATORY
B/300, Z/4A1, 2070 ROUTE 52, HOPEWELL JUNCTION, NY 12533-6531
(845) 894-5700, ALTERNATE (845) 894-4060

Town of POK
WELLS

January 6, 2003

To: M. West
Z/325
East Fishkill

COC FORM #:	34988, 34989,34991, 34990
EF LAB ID#'S	0209656 - 0209659

Enclosed please find the analytical results for the samples received by our laboratory on November 25, 2002.

If you have any questions or concerns, please feel free to contact Gary Marone at (845) 894-5700.

FINAL REPORT REVIEWED AND APPROVED

G Marone 1/7/03
Gary Marone Date
Lab Director

Thank You.

IBM HUDSON VALLEY ENVIRONMENTAL LAB

File

Number of Pages to Follow: 34

IBM HUDSON VALLEY ENVIRONMENTAL LABORATORY
B/300-4A1, ROUTE 52, HOPEWELL JUNCTION, NY 12533
(914) 894-4060 ALTERNATE (914) 894-7961

CHAIN OF CUSTODY DOCUMENT
(NYSDOH-LAB NO. 10426)

34988

CUSTOMER NAME	DATE	IBM LOCATION NAME
IBM EAST FISHKILL	11-25-02	PK WELL SAMPLES
ADDRESS: 1580 ROUTE 52 HOPEWELL JCT, NY		PROJECT NAME
SAMPLER: Jim Mahoney	PHONE NO: 894-4060	PROJECT/PO/IPT #
NAME OF CONTACT: M WEST	PHONE NO: 894-5536	

NY PUBLIC WATER SUPPLIES
SOURCE ID
ELRP TYPE
FEDERAL ID

TURNAROUND
28 DYS
14 DYS
OTHER 7 dys
VERBAL

DESCRIPTION / CUSTOMER NUMBER	COLLECTED DATE	COLLECTED TIME	GRAB OR COMPOSITE	MATRIX CODE	SAMPLE SEAL(S)	BOTTLES NO. VOL	PRESERVED WITH	RECEIVING PH	RECEIVING TEMP	ANALYSIS REQUESTED	COMMENTS
Well 1	11-25 02	12 05 p	GRAB	[illegible]		1/250 ML	NONE			ALKALINITY (CO2, CO3, HCO3)	
						1/1000 ML	NONE			COLOR, SP COND, TDS, TURB, NO2, SULFIDE	
						1/500 ML	NONE			CHLORIDE, NO3, SO4, PO4, TF, pH	
						1/500 ML	H2SO4			NH3/N (AS AMMONIUM)	
						1/1000 ML	NAOH/ASCORBIC ACID			TOTAL CN	
						1/500 ML	HNO3			HG	
						1/1000 ML	HNO3			TOTAL HARDNESS, AL, BA, CD, CU, FE,	
										MN, K, NA, ZN, SB, BE, CA, GA, PB,	
										MO, SE, TL, AS, B, CR, AU, MG, NI,	
										AG, V, SI	
						~~1/120 ML~~	~~NA2S2O3~~			(KV) ~~HPC TOTAL COLIFORM~~	
				[illegible]		3/40	WAHSOY			5022	

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
[signature]	11-25-02	1330	Judie Lund	11/25/02	145 pm
RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME

COMMENTS: Also Collected 1-500ml UNP, 1-5GAL UNP For 13316 Analys. [signature]

Samples Received ON ICE

LAB COPY

M30-7387-4 U/M 03 REV. 11/22/99

IBM HUDSON VALLEY ENVIRONMENTAL LABORATORY

B/300-4A1, ROUTE 52, HOPEWELL JUNCTION, NY 12533

(914) 894-4060 ALTERNATE (914) 894-7961

CHAIN OF CUSTODY DOCUMENT

(NYSDOH-LAB NO. 10426)

34989

CUSTOMER NAME	DATE	IBM LOCATION NAME
IBM EAST FISHKILL	11-25-02	PK WELL SAMPLES
ADDRESS		PROJECT NAME
1580 ROUTE 52 HOPEWELL JCT, NY		
SAMPLER: Jim Mahoney	PHONE NO: 894-4060	PROJECT/PO/IPT #
NAME OF CONTACT: M WEST	PHONE NO: 894-5536	

NY PUBLIC WATER SUPPLIES

SOURCE ID ___ ___ ___

ELRP TYPE ___ ___ ___

FEDERAL ID ___ ___ ___ ___ ___ ___ ___

TURNAROUND: 28 DYS ___ 14 DYS ___ OTHER 7 dys VERBAL

DESCRIPTION / CUSTOMER NUMBER	COLLECTED DATE	COLLECTED TIME	GRAB OR COMPOSITE	LAB NO.	SAMPLE REALIZ	BOTTLES NO.	VOL	PRESERVED WITH	RECEIVING PH	RECEIVING TEMP	ANALYSIS REQUESTED	COMMENTS
Well 2	11-25-02	1130	GRAB	[illegible]		1	250 ML	NONE			ALKALINITY (CO2, CO3, HCO3)	
						1	1000 ML	NONE			COLOR, SP COND, TDS, TURB, NO2, SULFIDE	
						1	500 ML	NONE			CHLORIDE, NO3, SO4, PO4, TF, pH	
						1	500 ML	H2SO4			NH3/N (AS AMMONIUM)	
						1	1000 ML	NAOH/ASCORBIC ACID			TOTAL CN	
						1	500 ML	HNO3			HG	
						1	1000 ML	HNO3			TOTAL HARDNESS, AL, BA, CD, CU, FE,	
											MN, K, NA, ZN, SB, BE, CA, GA, PB,	
											MO, SE, TL, AS, B, CR, AU, MG, NI,	
											AG, V, SI	
						1	120 ML	NA2S2O3			HPC ~~TOTAL COLIFORM~~	KW
				0201125	547	3	40 ML	NAHSO4			502.2	

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
[signature]	11-25-02	1330	Trudie Lund	11/25/02	1145

COMMENTS: Also collected 1-500mL UNP, 1-5 gal UNP for B316 ANALS [signature]

Samples Received ON ICE

LAB COPY

M30-7387-4 U/M 03 REV. 11/22/99

IBM HUDSON VALLEY ENVIRONMENTAL LABORATORY
B/300-4A1, ROUTE 52, HOPEWELL JUNCTION, NY 12533
(914) 894-4060 ALTERNATE (914) 894-7961

CHAIN OF CUSTODY DOCUMENT
(NYSDOH-LAB NO. 10426)

34991

CUSTOMER NAME: IBM EAST FISHKILL	DATE: 11-25-02	IBM LOCATION NAME: PK WELL SAMPLES	NY PUBLIC WATER SUPPLIES
ADDRESS: 1580 ROUTE 52 HOPEWELL JCT, NY		PROJECT NAME:	SOURCE ID ___
SAMPLER: Jim Mahoney	PHONE NO: 894-4060	PROJECT/PO/IPT #:	ELRP TYPE ___
NAME OF CONTACT: M WEST	PHONE NO: 894-5536		FEDERAL ID ___

TURNAROUND: 28 DYS ___ 14 DYS ___ OTHER 7 dys VERBAL ___

DESCRIPTION / CUSTOMER NUMBER	COLLECTED DATE	COLLECTED TIME	GRAB OR COMPOSITE	HV LAB ID NO.	SAMPLE SEAL(S)	BOTTLES NO. / VOL	PRESERVED WITH	RECEIVING pH	RECEIVING TEMP	ANALYSIS REQUESTED	COMMENTS
Well 2 (Duplicate)	11-25-02	1145	GRAB	[illegible]		1/250 ML	NONE			ALKALINITY (CO2, CO3, HCO3)	
						1/1000 ML	NONE			COLOR, SP COND, TDS, TURB, NO2, SULFIDE	
						1/500 ML	NONE			CHLORIDE, NO3, SO4, PO4, TF, pH	
						1/500 ML	H2SO4			NH3/N (AS AMMONIUM)	
						1/1000 ML	NAOH/ASCORBIC ACID			TOTAL CN	
						1/500 ML	HNO3			HG	
						1/1000 ML	HNO3			TOTAL HARDNESS, AL, BA, CD, CU, FE,	
										MN, K, NA, ZN, SB, BE, CA, GA, PB,	
										MO, SE, TL, AS, B, CR, AU, MG, NI,	
										AG, V, SI	
						~~1/120 ML~~	~~NA2S2O3~~		(N)	~~HPC TOTAL COLIFORM~~	
				[illegible]	548	3/40	NAHSO4			SO2 2	

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
[signature]	11-25-02	1330	Judie Lund	11/25/02	1450
RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME

COMMENTS: Also collected 1-500 ml unp, 1-5 GAL unp for B316 anals. [signature]

Samples Received ON ICE

M30-7387-4 U/M 03 REV. 11/22/99

LAB COPY

IBM HUDSON VALLEY ENVIRONMENTAL LABORATORY
B/300-4A1, ROUTE 52, HOPEWELL JUNCTION, NY 12533
(914) 894-4060 ALTERNATE (914) 894-7961

CHAIN OF CUSTODY DOCUMENT
(NYSDOH-LAB NO. 10426)

34990

CUSTOMER NAME	DATE	IBM LOCATION NAME
IBM EAST FISHKILL	11-25-02	PK WELL SAMPLES
ADDRESS: 1580 ROUTE 52 HOPEWELL JCT, NY		PROJECT NAME
SAMPLER: Jim Mahoney	PHONE NO: 894-4060	PROJECT/PO/IPT #
NAME OF CONTACT: WEST	PHONE NO: 894-5536	

NY PUBLIC WATER SUPPLIES
SOURCE ID ___
ELRP TYPE ___
FEDERAL ID ___

TURNAROUND
28 DYS ___
14 DYS ___
OTHER 7dys
VERBAL ___

DESCRIPTION / CUSTOMER NUMBER	COLLECTED DATE	COLLECTED TIME	GRAB OR COMPOSITE	[illegible]	SAMPLE SEAL(S)	BOTTLES NO. VOL	PRESERVED WITH	RECEIVING [illegible]	RECEIVING [illegible]	ANALYSIS REQUESTED	COMMENTS
Well 3	11-25-02	12:15	GRAB	[illegible]		1/250 ML	NONE			ALKALINITY (CO2, CO3, HCO3)	
						1/1000 ML	NONE			COLOR, SP COND, TDS, TURB, NO2, SULFIDE	
						1/500 ML	NONE			CHLORIDE, NO3, SO4, PO4, TF, pH	
						1/500 ML	H2SO4			NH3/N (AS AMMONIUM)	
						1/1000 ML	NAOH/ASCORBIC ACID			TOTAL CN	
						1/500 ML	HNO3			HG	
						1/1000 ML	HNO3			TOTAL HARDNESS, AL, BA, CD, CU, FE,	
										MN, K, NA, ZN, SB, BE, CA, GA, PB,	
										MO, SE, TL, AS, B, CR, AU, MG, NI,	
										AG, V, SI	
						~~1/120 ML~~	~~NA2S2O3~~			~~HPC TOTAL COLIFORM~~	(K)
				[illegible]	544	3/40	WAHSOY			502.2	

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
[signature]	11-25-02	13:30	Judie Lund	11/25/02	145pm

COMMENTS: AXISO Collected 1-500mL UNP, 1-5gal UNP For B316 ANALS [signature]

Samples Received ON ICE

LAB COPY

M30-7387-4 U/M 03 REV. 11/22/99

IBM Hudson Valley Environmental Laboratory
2070 Route 52, B/300, Z/4A1
Hopewell Junction, NY 12533

NYSDOH ELAP # 10426
NELAP Accredited

ANALYTICAL RESULTS

Client : J. Braungart **Phone :** (845) 892-1672 **Fax :** (845) 892-4627

Lab ID : 0209656 **COC :** 34988 **Date/Time Sampled:** 11/25/02 12:05
Client Sample ID : Well 1 **Date Received:** 11/25/02
Sample Type : Water **Date Reported:** 01/07/03

Test	Method	MDL	Result	Units	Analysis Date	Analysis Time (when required)	Analyst
Total Alkalinity (as CaCO3)	SM18 2320B	0.4	182	mg/L	11/27/02		Vinal
Ammonia as N (Undistilled)	EPA 350.3	0.10	< 0.10	mg/L	11/26/02		Vinal
Anion/Cation Balance	N/A		See attached		12/27/02		Jouppi
Color	EPA 110.2	5	< 5	Pt-Co	11/26/02	9:00	Vinal
Corrosivity	SM19 2330	-13.0	-0.2	SI	12/12/02		Jouppi
Total Cyanide	EPA 335.4	0.003	< 0.003	mg/L	11/26/02		Owen
Total Fluoride (Undistilled)	10-109-12-2a	0.04	0.05	mg/L	11/26/02		Owen
Total Hardness	EPA 130.2	4.0	228	mg/L	11/27/02		Owen
Hydrogen ion (pH)	EPA 150.1	1.0	7.2	SU	11/25/02	12:05	Mahoney
Specific Conductance	SM18 2510B	1.0	616	umhos/cm	11/27/02		Owen
Sulfide as H2S (Process Analysis	Hach HSC	0.1	< 0.1	mg/L	11/26/02		Vinal
Total Dissolved Solids	SM18 2540C	10	328	mg/L	11/26/02		Owen
Turbidity	EPA 180.1	0.10	< 0.10	NTU	11/26/02	9:30	Owen
Chloride	EPA 300.0	1.30	56.4	mg/L	11/27/02		Mazzetti
Nitrate as Nitrogen	EPA 300.0	0.014	0.826	mg/L	11/26/02	10:34	Mazzetti
Nitrite as Nitrogen	EPA 300.0	0.04	0.34	mg/L	11/26/02	10:34	Mazzetti
Phosphate as P	EPA 300.0	0.05	< 0.05	mg/L	11/26/02	10:34	Mazzetti
Sulfate	EPA 300.0	0.06	27.4	mg/L	11/26/02		Mazzetti
Aluminum	EPA 200.7	0.02	0.02	mg/L	12/09/02		Peaton
Arsenic	EPA 200.7	0.005	0.006	mg/L	12/02/02		Peaton
Barium	EPA 200.7	0.04	< 0.04	mg/L	12/02/02		Peaton
Beryllium	EPA 200.7	0.0006	< 0.0006	mg/L	12/02/02		Peaton

Comments : Drinking water sample screening indicates no digestion required. Gallium is a process analyte. Analysis for Antimony, Lead, Selenium and Thallium subcontracted to Severn Trent Labs - job 218715.

IBM Hudson Valley Environmental Laboratory
2070 Route 52, B/300, Z/4A1
Hopewell Junction, NY 12533

NYSDOH ELAP # 10426
NELAP Accredited

ANALYTICAL RESULTS

Client : J. Braungart **Phone :** (845) 892-1672 **Fax :** (845) 892-4627

Lab ID : 0209656 **COC :** 34988 **Date/Time Sampled:** 11/25/02 12:05
Client Sample ID : Well 1 **Date Received:** 11/25/02
Sample Type : Water **Date Reported:** 01/07/03

Test	Method	MDL	Result	Units	Analysis Date	Analysis Time (when required)	Analyst
Boron	EPA 200.7	0.01	0.02	mg/L	12/02/02		Peaton
Cadmium	EPA 200.7	0.0002	< 0.0002	mg/L	12/02/02		Peaton
Calcium	EPA 200.7	0.02	65.3	mg/L	12/09/02		Peaton
Chromium	EPA 200.7	0.001	< 0.001	mg/L	12/02/02		Peaton
Copper	EPA 200.7	0.003	0.005	mg/L	12/02/02		Peaton
Iron	EPA 200.7	0.006	< 0.006	mg/L	12/02/02		Peaton
Magnesium	EPA 200.7	0.01	16.5	mg/L	12/09/02		Peaton
Manganese	EPA 200.7	0.005	< 0.005	mg/L	12/02/02		Peaton
Molybdenum	EPA 200.7	0.005	< 0.005	mg/L	12/02/02		Peaton
Nickel	EPA 200.7	0.005	< 0.005	mg/L	12/02/02		Peaton
Potassium	EPA 200.7	0.05	1.44	mg/L	12/09/02		Peaton
Silver	EPA 200.7	0.0005	< 0.0005	mg/L	12/19/02		Peaton
Sodium	EPA 200.7	0.1	35.5	mg/L	12/13/02		Peaton
Vanadium	EPA 200.7	0.001	< 0.001	mg/L	12/02/02		Peaton
Zinc	EPA 200.7	0.005	< 0.005	mg/L	12/19/02		Peaton
Gold (Process Only)	SW846 6010	0.05	< 0.05	mg/L	12/09/02		Peaton
Gallium	EPA 200.7	0.01	< 0.01	mg/L	12/13/02		Peaton
Silica (Process Analysis)	EPA 200.7	0.01	3.75	mg/L	12/02/02		Peaton
Mercury	EPA 245.1	0.0002	< 0.0002	mg/L	12/13/02		Wiseman

Comments : Drinking water sample screening indicates no digestion required. Gallium is a process analyte. Analysis for Antimony, Lead, Selenium and Thallium subcontracted to Severn Trent Labs - job 218715.

Anion Cation Balance Worksheet

Date: 12/27/2002

Sample ID: 0209656

Sample Date: 11/25/2002

Description: IBM East Fishkill Production Well 1

Cation Sum = 310.53
Anion Sum = 293.12
% Difference = 2.88

Specie Name	Conc. (mg/L)	CaCO3 Conversion Factor	CaCO3 Equiv.	
Positive Ions:				
Aluminum	0.02	5.56	0.1112	
Ammonia as N	ND	3.57	0	
Antimony	ND		0	
Arsenic	0.006		0	
Barium	ND	0.73	0	
Beryllium	ND	11.11	0	
Boron	0.02	13.89	0.2778	
Cadmium	ND	0.89	0	
Calcium	65.3	2.5	163.25	
Chromium	ND		0	
Copper	0.005	1.57	0.00785	
Gallium	ND	2.15	0	
Gold	ND		0	
Iron	ND	2.69	0	
Lead	ND		0	
Magnesium	16.5	4.1	67.65	
Manganese	ND	1.82	0	
Mercury	ND		0	
Molybdenum	ND	3.13	0	
Nickel	ND		0	
Potassium	1.44	1.28	1.8432	
Selenium	ND		0	
Silver	ND	0.46	0	
Sodium	35.5	2.18	77.39	
Thallium	ND		0	
Vanadium	ND		0	
Zinc	ND	1.53	0	
			310.53	Cation Sum
Negative Ions:				
Total Alkalinity as CaCO3	182	1	182	
Chloride	56.4	1.41	79.524	
Nitrate as N	0.826	3.59	2.96534	
Sulfate	27.4	1.04	28.496	
Total Fluoride	0.05	2.63	0.1315	
			293.12	Anion Sum

IBM Hudson Valley Environmental Laboratory
2070 Route 52, B/300, Z/4A1
Hopewell Junction, NY 12533

NYSDOH ELAP # 10426
NELAP Accredited

ANALYTICAL RESULTS

Client : J. Braungart **Phone :** (845) 892-1672 **Fax :** (845) 892-4627

Lab ID : 0209657 **COC :** 34989 **Date/Time Sampled:** 11/25/02 11:30
Client Sample ID : Well 2 **Date Received:** 11/25/02
Sample Type : Water **Date Reported:** 01/07/03

Test	Method	MDL	Result	Units	Analysis Date	Analysis Time (when required)	Analyst
Total Alkalinity (as CaCO3)	SM18 2320B	0.4	157	mg/L	11/27/02		Vinal
Ammonia as N (Undistilled)	EPA 350.3	0.10	< 0.10	mg/L	11/26/02		Vinal
Anion/Cation Balance	N/A		See attached		12/27/02		Jouppi
Color	EPA 110.2	5	< 5	Pt-Co	11/26/02	9:00	Vinal
Corrosivity	SM19 2330	-13.0	-0.6	SI	12/12/02		Jouppi
Total Cyanide	EPA 335.4	0.003	< 0.003	mg/L	11/26/02		Owen
Total Fluoride (Undistilled)	10-109-12-2a	0.04	0.05	mg/L	11/26/02		Owen
Total Hardness	EPA 130.2	4.0	208	mg/L	11/27/02		Owen
Hydrogen ion (pH)	EPA 150.1	1.0	6.9	SU	11/25/02	11:30	Mahoney
Specific Conductance	SM18 2510B	1.0	548	umhos/cm	11/27/02		Owen
Sulfide as H2S (Process Analysis	Hach HSC	0.1	< 0.1	mg/L	11/26/02		Vinal
Total Dissolved Solids	SM18 2540C	10	295	mg/L	11/26/02		Owen
Turbidity	EPA 180.1	0.10	< 0.10	NTU	11/26/02	9:30	Owen
Chloride	EPA 300.0	0.13	61.7	mg/L	11/26/02		Mazzetti
Nitrate as Nitrogen	EPA 300.0	0.014	0.573	mg/L	11/26/02	10:47	Mazzetti
Nitrite as Nitrogen	EPA 300.0	0.04	0.43	mg/L	11/26/02	10:47	Mazzetti
Phosphate as P	EPA 300.0	0.25	6.02	mg/L	11/27/02	11:27	Mazzetti
Sulfate	EPA 300.0	0.06	27.4	mg/L	11/26/02		Mazzetti
Aluminum	EPA 200.7	0.02	< 0.02	mg/L	12/09/02		Peaton
Arsenic	EPA 200.7	0.005	< 0.005	mg/L	12/02/02		Peaton
Barium	EPA 200.7	0.04	< 0.04	mg/L	12/02/02		Peaton
Beryllium	EPA 200.7	0.0006	< 0.0006	mg/L	12/02/02		Peaton

Comments : Drinking water sample screening indicates no digestion required. Gallium is a process analyte. Analysis for Antimony, Lead, Selenium, and Thallium subcontracted to Severn Trent Labs - job 218715.

IBM Hudson Valley Environmental Laboratory
2070 Route 52, B/300, Z/4A1
Hopewell Junction, NY 12533

NYSDOH ELAP # 10426
NELAP Accredited

ANALYTICAL RESULTS

Client : J. Braungart **Phone :** (845) 892-1672 **Fax :** (845) 892-4627

Lab ID : 0209657 **COC :** 34989 **Date/Time Sampled:** 11/25/02 11:30
Client Sample ID : Well 2 **Date Received:** 11/25/02
Sample Type : Water **Date Reported:** 01/07/03

Test	Method	MDL	Result	Units	Analysis Date	Analysis Time (when required)	Analyst
Boron	EPA 200.7	0.01	0.02	mg/L	12/02/02		Peaton
Cadmium	EPA 200.7	0.0002	< 0.0002	mg/L	12/02/02		Peaton
Calcium	EPA 200.7	0.02	58.3	mg/L	12/09/02		Peaton
Chromium	EPA 200.7	0.001	< 0.001	mg/L	12/02/02		Peaton
Copper	EPA 200.7	0.003	< 0.003	mg/L	12/02/02		Peaton
Iron	EPA 200.7	0.006	< 0.006	mg/L	12/02/02		Peaton
Magnesium	EPA 200.7	0.01	15.2	mg/L	12/09/02		Peaton
Manganese	EPA 200.7	0.005	< 0.005	mg/L	12/02/02		Peaton
Molybdenum	EPA 200.7	0.005	< 0.005	mg/L	12/02/02		Peaton
Nickel	EPA 200.7	0.005	< 0.005	mg/L	12/02/02		Peaton
Potassium	EPA 200.7	0.05	1.44	mg/L	12/09/02		Peaton
Silver	EPA 200.7	0.0005	< 0.0005	mg/L	12/19/02		Peaton
Sodium	EPA 200.7	0.1	31.2	mg/L	12/13/02		Peaton
Vanadium	EPA 200.7	0.001	< 0.001	mg/L	12/02/02		Peaton
Zinc	EPA 200.7	0.005	< 0.005	mg/L	12/19/02		Peaton
Gold (Process Only)	SW846 6010	0.05	< 0.05	mg/L	12/09/02		Peaton
Gallium	EPA 200.7	0.01	< 0.01	mg/L	12/13/02		Peaton
Silica (Process Analysis)	EPA 200.7	0.01	3.40	mg/L	12/02/02		Peaton
Mercury	EPA 245.1	0.0002	< 0.0002	mg/L	12/13/02		Wiseman

Comments : Drinking water sample screening indicates no digestion required. Gallium is a process analyte. Analysis for Antimony, Lead, Selenium, and Thallium subcontracted to Severn Trent Labs - job 218715.

Anion Cation Balance Worksheet

Date: 12/27/2002

Sample ID: 0209657

Sample Date: 11/25/2002

Description: IBM East Fishkill Production Well 2

Cation Sum = 278.21
Anion Sum = 274.68
% Difference = 0.64

Specie Name	Conc. (mg/L)	CaCO3 Conversion Factor	CaCO3 Equiv.	
Positive Ions:				
Aluminum	ND	5.56	0	
Ammonia as N	ND	3.57	0	
Antimony	ND		0	
Arsenic	ND		0	
Barium	ND	0.73	0	
Beryllium	ND	11.11	0	
Boron	0.02	13.89	0.2778	
Cadmium	ND	0.89	0	
Calcium	58.3	2.5	145.75	
Chromium	ND		0	
Copper	ND	1.57	0	
Gallium	ND	2.15	0	
Gold	ND		0	
Iron	ND	2.69	0	
Lead	ND		0	
Magnesium	15.2	4.1	62.32	
Manganese	ND	1.82	0	
Mercury	ND		0	
Molybdenum	ND	3.13	0	
Nickel	ND		0	
Potassium	1.44	1.28	1.8432	
Selenium	ND		0	
Silver	ND	0.46	0	
Sodium	31.2	2.18	68.016	
Thallium	ND		0	
Vanadium	ND		0	
Zinc	ND	1.53	0	
			278.21	Cation Sum
Negative Ions:				
Total Alkalinity as CaCO3	157	1	157	
Chloride	61.7	1.41	86.997	
Nitrate as N	0.573	3.59	2.05707	
Sulfate	27.4	1.04	28.496	
Total Fluoride	0.05	2.63	0.1315	
			274.68	Anion Sum

IBM Hudson Valley Environmental Laboratory
2070 Route 52, B/300, Z/4A1
Hopewell Junction, NY 12533

NYSDOH ELAP # 10426
NELAP Accredited

ANALYTICAL RESULTS

Client : J. Braungart **Phone :** (845) 892-1672 **Fax :** (845) 892-4627

Lab ID : 0209658 **COC :** 34991 **Date/Time Sampled:** 11/25/02 11:45
Client Sample ID : Well 2 (Duplicate) **Date Received:** 11/25/02
Sample Type : Water **Date Reported:** 01/07/03

Test	Method	MDL	Result	Units	Analysis Date	Analysis Time (when required)	Analyst
Total Alkalinity (as CaCO3)	SM18 2320B	0.4	160	mg/L	11/27/02		Vinal
Ammonia as N (Undistilled)	EPA 350.3	0.10	< 0.10	mg/L	11/26/02		Vinal
Anion/Cation Balance	N/A		See attached		12/27/02		Jouppi
Color	EPA 110.2	5	< 5	Pt-Co	11/26/02	9:00	Vinal
Corrosivity	SM19 2330	-13.0	-0.6	SI	12/12/02		Jouppi
Total Cyanide	EPA 335.4	0.003	< 0.003	mg/L	11/26/02		Owen
Total Fluoride (Undistilled)	10-109-12-2a	0.04	0.05	mg/L	11/26/02		Owen
Total Hardness	EPA 130.2	4.0	207	mg/L	11/27/02		Owen
Hydrogen ion (pH)	EPA 150.1	1.0	6.9	SU	11/25/02	11:30	Mahoney
Specific Conductance	SM18 2510B	1.0	549	umhos/cm	11/27/02		Owen
Sulfide as H2S (Process Analysis	Hach HSC	0.1	< 0.1	mg/L	11/26/02		Vinal
Total Dissolved Solids	SM18 2540C	10	293	mg/L	11/26/02		Owen
Turbidity	EPA 180.1	0.10	< 0.10	NTU	11/26/02	9:30	Owen
Chloride	EPA 300.0	1.30	57.1	mg/L	11/27/02		Mazzetti
Nitrate as Nitrogen	EPA 300.0	0.014	0.570	mg/L	11/26/02	11:01	Mazzetti
Nitrite as Nitrogen	EPA 300.0	0.04	0.29	mg/L	11/26/02	11:01	Mazzetti
Phosphate as P	EPA 300.0	0.05	0.45	mg/L	11/26/02	11:01	Mazzetti
Sulfate	EPA 300.0	0.60	30.3	mg/L	11/27/02		Mazzetti
Aluminum	EPA 200.7	0.02	< 0.02	mg/L	12/09/02		Peaton
Arsenic	EPA 200.7	0.005	< 0.005	mg/L	12/02/02		Peaton
Barium	EPA 200.7	0.04	< 0.04	mg/L	12/02/02		Peaton
Beryllium	EPA 200.7	0.0006	< 0.0006	mg/L	12/02/02		Peaton

Comments : Drinking water sample screening indicates no digestion required. Gallium is a process analyte. Analysis for Antimony, Lead, Selenium, and Thallium subcontracted to Severn Trent Labs - job 218715.

IBM Hudson Valley Environmental Laboratory
2070 Route 52, B/300, Z/4A1
Hopewell Junction, NY 12533

NYSDOH ELAP # 10426
NELAP Accredited

ANALYTICAL RESULTS

Client : J. Braungart Phone : (845) 892-1672 Fax : (845) 892-4627

Lab ID : 0209658 COC : 34991 Date/Time Sampled: 11/25/02 11:45
Client Sample ID : Well 2 (Duplicate) Date Received: 11/25/02
Sample Type : Water Date Reported: 01/07/03

Test	Method	MDL	Result	Units	Analysis Date	Analysis Time (when required)	Analyst
Boron	EPA 200.7	0.01	0.02	mg/L	12/02/02		Peaton
Cadmium	EPA 200.7	0.0002	< 0.0002	mg/L	12/02/02		Peaton
Calcium	EPA 200.7	0.02	58.3	mg/L	12/09/02		Peaton
Chromium	EPA 200.7	0.001	< 0.001	mg/L	12/02/02		Peaton
Copper	EPA 200.7	0.003	< 0.003	mg/L	12/02/02		Peaton
Iron	EPA 200.7	0.006	< 0.006	mg/L	12/02/02		Peaton
Magnesium	EPA 200.7	0.01	15.2	mg/L	12/09/02		Peaton
Manganese	EPA 200.7	0.005	< 0.005	mg/L	12/02/02		Peaton
Molybdenum	EPA 200.7	0.005	< 0.005	mg/L	12/02/02		Peaton
Nickel	EPA 200.7	0.005	< 0.005	mg/L	12/02/02		Peaton
Potassium	EPA 200.7	0.05	1.42	mg/L	12/09/02		Peaton
Silver	EPA 200.7	0.0005	< 0.0005	mg/L	12/19/02		Peaton
Sodium	EPA 200.7	0.1	31.0	mg/L	12/13/02		Peaton
Vanadium	EPA 200.7	0.001	< 0.001	mg/L	12/02/02		Peaton
Zinc	EPA 200.7	0.005	< 0.005	mg/L	12/19/02		Peaton
Gold (Process Only)	SW846 6010	0.05	< 0.05	mg/L	12/09/02		Peaton
Gallium	EPA 200.7	0.01	< 0.01	mg/L	12/13/02		Peaton
Silica (Process Analysis)	EPA 200.7	0.01	3.48	mg/L	12/02/02		Peaton
Mercury	EPA 245.1	0.0002	< 0.0002	mg/L	12/13/02		Wiseman

Comments : Drinking water sample screening indicates no digestion required. Gallium is a process analyte. Analysis for Antimony, Lead, Selenium, and Thallium subcontracted to Severn Trent Labs - job 218715.

Anion Cation Balance Worksheet

Date: 12/27/2002

Sample ID: 0209658

Sample Date: 11/25/2002

Description: IBM East Fishkill Production Well 2 Duplicate

Cation Sum = 277.75
Anion Sum = 274.20
% Difference = 0.64

Specie Name	Conc. (mg/L)	CaCO3 Conversion Factor	CaCO3 Equiv.	
Positive Ions:				
Aluminum	ND	5.56	0	
Ammonia as N	ND	3.57	0	
Antimony	ND		0	
Arsenic	ND		0	
Barium	ND	0.73	0	
Beryllium	ND	11.11	0	
Boron	0.02	13.89	0.2778	
Cadmium	ND	0.89	0	
Calcium	58.3	2.5	145.75	
Chromium	ND		0	
Copper	ND	1.57	0	
Gallium	ND	2.15	0	
Gold	ND		0	
Iron	ND	2.69	0	
Lead	ND		0	
Magnesium	15.2	4.1	62.32	
Manganese	ND	1.82	0	
Mercury	ND		0	
Molybdenum	ND	3.13	0	
Nickel	ND		0	
Potassium	1.42	1.28	1.8176	
Selenium	ND		0	
Silver	ND	0.46	0	
Sodium	31	2.18	67.58	
Thallium	ND		0	
Vanadium	ND		0	
Zinc	ND	1.53	0	
			277.75	Cation Sum
Negative Ions:				
Total Alkalinity as CaCO3	160	1	160	
Chloride	57.1	1.41	80.511	
Nitrate as N	0.57	3.59	2.0463	
Sulfate	30.3	1.04	31.512	
Total Fluoride	0.05	2.63	0.1315	
			274.20	Anion Sum

IBM Hudson Valley Environmental Laboratory
2070 Route 52, B/300, Z/4A1
Hopewell Junction, NY 12533

NYSDOH ELAP # 10426
NELAP Accredited

ANALYTICAL RESULTS

Client : J. Braungart **Phone :** (845) 892-1672 **Fax :** (845) 892-4627

Lab ID : 0209659 **COC :** 34990 **Date/Time Sampled:** 11/25/02 12:15
Client Sample ID : Well 3 **Date Received:** 11/25/02
Sample Type : Water **Date Reported:** 01/07/03

Test	Method	MDL	Result	Units	Analysis Date	Analysis Time (when required)	Analyst
Total Alkalinity (as CaCO3)	SM18 2320B	0.4	229	mg/L	11/27/02		Vinal
Ammonia as N (Undistilled)	EPA 350.3	0.10	< 0.10	mg/L	11/26/02		Vinal
Anion/Cation Balance	N/A		See attached		12/27/02		Jouppi
Color	EPA 110.2	5	< 5	Pt-Co	11/26/02	9:00	Vinal
Corrosivity	SM19 2330	-13.0	0.0	SI	12/12/02		Jouppi
Total Cyanide	EPA 335.4	0.003	< 0.003	mg/L	11/26/02		Owen
Total Fluoride (Undistilled)	10-109-12-2a	0.04	< 0.04	mg/L	11/26/02		Owen
Total Hardness	EPA 130.2	4.0	288	mg/L	11/27/02		Owen
Hydrogen Ion (pH)	EPA 150.1	1.0	7.2	SU	11/25/02	12:15	Mahoney
Specific Conductance	SM18 2510B	1.0	865	umhos/cm	11/27/02		Owen
Sulfide as H2S (Process Analysis	Hach HSC	0.1	< 0.1	mg/L	11/26/02		Vinal
Total Dissolved Solids	SM18 2540C	10	463	mg/L	11/26/02		Owen
Turbidity	EPA 180.1	0.10	< 0.10	NTU	11/26/02	9:30	Owen
Chloride	EPA 300.0	1.30	112	mg/L	11/27/02		Mazzetti
Nitrate as Nitrogen	EPA 300.0	0.014	1.031	mg/L	11/26/02	11:14	Mazzetti
Nitrite as Nitrogen	EPA 300.0	0.04	< 0.04	mg/L	11/26/02	11:14	Mazzetti
Phosphate as P	EPA 300.0	0.05	0.61	mg/L	11/26/02	11:14	Mazzetti
Sulfate	EPA 300.0	0.60	33.7	mg/L	11/27/02		Mazzetti
Aluminum	EPA 200.7	0.02	< 0.02	mg/L	12/09/02		Peaton
Arsenic	EPA 200.7	0.005	< 0.005	mg/L	12/02/02		Peaton
Barium	EPA 200.7	0.04	< 0.04	mg/L	12/02/02		Peaton
Beryllium	EPA 200.7	0.0006	< 0.0006	mg/L	12/02/02		Peaton

Comments : Drinking water sample screening indicates no digestion required. Gallium is a process analyte. Analysis for Antimony, Lead, Selenium, and Thallium subcontracted to Severn Trent Labs - job 218715.

IBM Hudson Valley Environmental Laboratory
2070 Route 52, B/300, Z/4A1
Hopewell Junction, NY 12533

NYSDOH ELAP # 10426
NELAP Accredited

ANALYTICAL RESULTS

Client : J. Braungart **Phone :** (845) 892-1672 **Fax :** (845) 892-4627

Lab ID : 0209659 **COC :** 34990 **Date/Time Sampled:** 11/25/02 12:15
Client Sample ID : Well 3 **Date Received:** 11/25/02
Sample Type : Water **Date Reported:** 01/07/03

Test	Method	MDL	Result	Units	Analysis Date	Analysis Time (when required)	Analyst
Boron	EPA 200.7	0.01	0.04	mg/L	12/02/02		Peaton
Cadmium	EPA 200.7	0.0002	< 0.0002	mg/L	12/02/02		Peaton
Calcium	EPA 200.7	0.02	81.2	mg/L	12/09/02		Peaton
Chromium	EPA 200.7	0.001	< 0.001	mg/L	12/02/02		Peaton
Copper	EPA 200.7	0.003	0.003	mg/L	12/02/02		Peaton
Iron	EPA 200.7	0.006	< 0.006	mg/L	12/02/02		Peaton
Magnesium	EPA 200.7	0.01	20.0	mg/L	12/09/02		Peaton
Manganese	EPA 200.7	0.005	< 0.005	mg/L	12/02/02		Peaton
Molybdenum	EPA 200.7	0.005	< 0.005	mg/L	12/02/02		Peaton
Nickel	EPA 200.7	0.005	< 0.005	mg/L	12/02/02		Peaton
Potassium	EPA 200.7	0.05	1.57	mg/L	12/09/02		Peaton
Silver	EPA 200.7	0.0005	< 0.0005	mg/L	12/19/02		Peaton
Sodium	EPA 200.7	0.1	66.2	mg/L	12/13/02		Peaton
Vanadium	EPA 200.7	0.001	< 0.001	mg/L	12/02/02		Peaton
Zinc	EPA 200.7	0.005	< 0.005	mg/L	12/19/02		Peaton
Gold (Process Only)	SW846 6010	0.05	< 0.05	mg/L	12/09/02		Peaton
Gallium	EPA 200.7	0.01	< 0.01	mg/L	12/13/02		Peaton
Silica (Process Analysis)	EPA 200.7	0.01	4.40	mg/L	12/02/02		Peaton
Mercury	EPA 245.1	0.0002	< 0.0002	mg/L	12/13/02		Wiseman

Comments : Drinking water sample screening indicates no digestion required. Gallium is a process analyte. Analysis for Antimony, Lead, Selenium, and Thallium subcontracted to Severn Trent Labs - job 218715.

Anion Cation Balance Worksheet | Date: 12/27/2002

Sample ID: 0209659 | Sample Date: 11/25/2002
Description: IBM East Fishkill Production Well 3

Cation Sum = 431.89
Anion Sum = 425.67
% Difference = 0.72

Specie Name	Conc. (mg/L)	CaCO3 Conversion Factor	CaCO3 Equiv.	
Positive Ions:				
Aluminum	ND	5.56	0	
Ammonia as N	ND	3.57	0	
Antimony	ND		0	
Arsenic	ND		0	
Barium	ND	0.73	0	
Beryllium	ND	11.11	0	
Boron	0.04	13.89	0.5556	
Cadmium	ND	0.89	0	
Calcium	81.2	2.5	203	
Chromium	ND		0	
Copper	0.003	1.57	0.00471	
Gallium	ND	2.15	0	
Gold	ND		0	
Iron	ND	2.69	0	
Lead	ND		0	
Magnesium	20	4.1	82	
Manganese	ND	1.82	0	
Mercury	ND		0	
Molybdenum	ND	3.13	0	
Nickel	ND		0	
Potassium	1.57	1.28	2.0096	
Selenium	ND		0	
Silver	ND	0.46	0	
Sodium	66.2	2.18	144.316	
Thallium	ND		0	
Vanadium	ND		0	
Zinc	ND	1.53	0	
			431.89	Cation Sum
Negative Ions:				
Total Alkalinity as CaCO3	229	1	229	
Chloride	112	1.41	157.92	
Nitrate as N	1.031	3.59	3.70129	
Sulfate	33.7	1.04	35.048	
Total Fluoride	ND	2.63	0	
			425.67	Anion Sum

IBM HUDSON VALLEY ENVIRONMENTAL LABORATORY
ELAP ID # 10426

TRACE ORGANICS ANALYSIS

FINAL REPORT PACKAGE REVIEW

CHAIN OF CUSTODY # 34989

SAMPLE IDENTIFICATION

LAB ID#	CUSTOMER ID	TRACE LAB ID
0209657	WELL 2	EF021125547

Client Name: M. WEST D/92DA Z/325
Client Sample ID: WELL 2
Lab Sample ID: 0209657
Date/Time Sampled: 11/25/2002 1130
Date Received: 11/25/2002
Location: IBM EAST FISHKILL
File No.: 1030A558
2nd CLIENT ID: WELL2

Report date: 12/05/2002
Project ID:
Matrix: LIQUID
Dilution Factor: 1.0
Date Analyzed: 11/27/2002
Method: 502.2
Batch No.: 7831
SAMPLER: J MAHONEY

CAS No.	COMPOUND	MDL ug/L	Result ug/L	Q
71-43-2	Benzene	0.12		U
108-86-1	Bromobenzene	0.26		U
74-97-5	Bromochloromethane	0.10		U
75-27-4	Bromodichloromethane	0.15		U
75-25-2	Bromoform	0.26		U
74-83-9	Bromomethane	0.16		U
104-51-8	n-Butylbenzene	0.12		U
135-98-8	sec-Butylbenzene	0.10		U
98-06-6	tert-Butylbenzene	0.11		U
56-23-5	Carbon Tetrachloride	0.11		U
108-90-7	Chlorobenzene	0.22		U
124-48-1	Chlorodibromomethane	0.21		U
75-00-3	Chloroethane	0.26		U
67-66-3	Chloroform	0.11		U
74-87-3	Chloromethane	0.10		U
95-49-8	2-Chlorotoluene	0.22		U
106-43-4	4-Chlorotoluene	0.42		U
96-12-8	1,2-Dibromo-3-Chloropropane	0.28		U
106-93-4	1,2-Dibromoethane	0.16		U
74-95-3	Dibromomethane	0.13		U
95-50-1	1,2-Dichlorobenzene	0.19		U
541-73-1	1,3-Dichlorobenzene	0.22		U
106-46-7	1,4-Dichlorobenzene	0.18		U
75-71-8	Dichlorodifluoromethane	0.15		U
75-34-3	1,1-Dichloroethane	0.12		U
107-06-2	1,2-Dichloroethane	0.07		U
75-35-4	1,1-Dichloroethene	0.12		U
156-59-4	cis-1,2-Dichloroethene	0.09		U
156-60-5	trans-1,2-Dichloroethene	0.09		U
78-87-5	1,2-Dichloropropane	0.10		U
142-28-9	1,3-Dichloropropane	0.18		U
590-20-7	2,2-Dichloropropane	0.28		U
563-58-6	1,1-Dichloropropene	0.07		U
10061-01-5	cis-1,3-Dichloropropene	0.10		U
10061-02-6	trans-1,3-Dichloropropene	0.14		U
100-41-4	Ethyl Benzene	0.08		U
87-68-3	Hexachlorobutadiene	0.18		U
98-82-8	Isopropylbenzene	0.10		U
99-87-6	4-Isopropyltoluene	0.11		U
75-09-2	Methylene Chloride	0.10		U
91-20-3	Naphthalene	0.59		U
103-65-1	Propylbenzene	0.10		U
100-42-5	Styrene	0.11		U

Client Name: M. WEST D/92DA Z/325
Client Sample ID: WELL 2
Lab Sample ID: 0209657
File No.: 1030A558

Report date: 12/05/2002
Project ID:
Matrix: LIQUID

CAS No.	COMPOUND	MDL ug/L	Result ug/L	Q
630-20-6	1,1,1,2-Tetrachloroethane	0.19		U
79-34-5	1,1,2,2-Tetrachloroethane	0.27		U
127-18-4	Tetrachloroethene	0.12		U
108-88-3	Toluene	0.07		U
87-61-6	1,2,3-Trichlorobenzene	0.26		U
120-82-1	1,2,4-Trichlorobenzene	0.18		U
71-55-6	1,1,1-Trichloroethane	0.10		U
79-00-5	1,1,2-Trichloroethane	0.19		U
79-01-6	Trichloroethene	0.09		U
75-69-4	Trichlorofluoromethane	0.29		U
96-18-4	1,2,3 Trichloropropane	0.28		U
95-63-6	1,2,4-Trimethylbenzene	0.11		U
108-67-8	1,3,5-Trimethylbenzene	0.15		U
75-01-4	Vinyl Chloride	0.17		U
95-47-6	o-Xylene	0.10		U
108-38-3/ 106-42-3	m&p-Xylene	0.16		U
	Non-EPA 502.2 Compounds			
67-64-1	Acetone	0.36		U
354-23-4	Freon 123A	0.15		U
76-13-1	Freon TF	0.13		U
1634-04-4	Methyl tert-butyl ether	0.33		U
109-99-9	Tetrahydrofuran	0.92		U

MDL = Method Detection Limit

Q = Data qualifiers:
U = Compound analyzed for but not detected.
J = An estimated value for a compound detected at greater than or equal to the MDL but less than the lowest calibration standard.
B = Analyte is found in the associated blank

Comments:

IBM HUDSON VALLEY ENVIRONMENTAL LABORATORY
ELAP ID # 10426

TRACE ORGANICS ANALYSIS

FINAL REPORT PACKAGE REVIEW

CHAIN OF CUSTODY # 34991

SAMPLE IDENTIFICATION

LAB ID#	CUSTOMER ID	TRACE LAB ID
0209658	WELL 2 DUPE	EF021125548

Client Name: M. WEST D/92DA Z/325
Client Sample ID: WELL 2 DUPE
Lab Sample ID: 0209658
Date/Time Sampled: 11/25/2002 1145
Date Received: 11/25/2002
Location: IBM EAST FISHKILL
File No.: 1030A559
2nd CLIENT ID: WELL2D

Report date: 12/05/2002
Project ID:
Matrix: LIQUID
Dilution Factor: 1.0
Date Analyzed: 11/27/2002
Method: 502.2
Batch No.: 7831
SAMPLER: J MAHONEY

CAS No.	COMPOUND	MDL ug/L	Result ug/L	Q
71-43-2	Benzene	0.12		U
108-86-1	Bromobenzene	0.26		U
74-97-5	Bromochloromethane	0.10		U
75-27-4	Bromodichloromethane	0.15		U
75-25-2	Bromoform	0.26		U
74-83-9	Bromomethane	0.16		U
104-51-8	n-Butylbenzene	0.12		U
135-98-8	sec-Butylbenzene	0.10		U
98-06-6	tert-Butylbenzene	0.11		U
56-23-5	Carbon Tetrachloride	0.11		U
108-90-7	Chlorobenzene	0.22		U
124-48-1	Chlorodibromomethane	0.21		U
75-00-3	Chloroethane	0.26		U
67-66-3	Chloroform	0.11		U
74-87-3	Chloromethane	0.10		U
95-49-8	2-Chlorotoluene	0.22		U
106-43-4	4-Chlorotoluene	0.42		U
96-12-8	1,2-Dibromo-3-Chloropropane	0.28		U
106-93-4	1,2-Dibromoethane	0.16		U
74-95-3	Dibromomethane	0.13		U
95-50-1	1,2-Dichlorobenzene	0.19		U
541-73-1	1,3-Dichlorobenzene	0.22		U
106-46-7	1,4-Dichlorobenzene	0.18		U
75-71-8	Dichlorodifluoromethane	0.15		U
75-34-3	1,1-Dichloroethane	0.12		U
107-06-2	1,2-Dichloroethane	0.07		U
75-35-4	1,1-Dichloroethene	0.12		U
156-59-4	cis-1,2-Dichloroethene	0.09		U
156-60-5	trans-1,2-Dichloroethene	0.09		U
78-87-5	1,2-Dichloropropane	0.10		U
142-28-9	1,3-Dichloropropane	0.18		U
590-20-7	2,2-Dichloropropane	0.28		U
563-58-6	1,1-Dichloropropene	0.07		U
10061-01-5	cis-1,3-Dichloropropene	0.10		U
10061-02-6	trans-1,3-Dichloropropene	0.14		U
100-41-4	Ethyl Benzene	0.08		U
87-68-3	Hexachlorobutadiene	0.18		U
98-82-8	Isopropylbenzene	0.10		U
99-87-6	4-Isopropyltoluene	0.11		U
75-09-2	Methylene Chloride	0.10		U
91-20-3	Naphthalene	0.59		U
103-65-1	Propylbenzene	0.10		U
100-42-5	Styrene	0.11		U

Client Name: M. WEST D/92DA Z/325
Client Sample ID: WELL 2 DUPE
Lab Sample ID: 0209658
File No.: 1030A559

Report date: 12/05/2002
Project ID:
Matrix: LIQUID

CAS No.	COMPOUND	MDL ug/L	Result ug/L	Q
630-20-6	1,1,1,2-Tetrachloroethane	0.19		U
79-34-5	1,1,2,2-Tetrachloroethane	0.27		U
127-18-4	Tetrachloroethene	0.12		U
108-88-3	Toluene	0.07		U
87-61-6	1,2,3-Trichlorobenzene	0.26		U
120-82-1	1,2,4-Trichlorobenzene	0.18		U
71-55-6	1,1,1-Trichloroethane	0.10		U
79-00-5	1,1,2-Trichloroethane	0.19		U
79-01-6	Trichloroethene	0.09		U
75-69-4	Trichlorofluoromethane	0.29		U
96-18-4	1,2,3 Trichloropropane	0.28		U
95-63-6	1,2,4-Trimethylbenzene	0.11		U
108-67-8	1,3,5-Trimethylbenzene	0.15		U
75-01-4	Vinyl Chloride	0.17		U
95-47-6	o-Xylene	0.10		U
108-38-3/ 106-42-3	m&p-Xylene	0.16		U
	Non-EPA 502.2 Compounds			
67-64-1	Acetone	0.36		U
354-23-4	Freon 123A	0.15		U
76-13-1	Freon TF	0.13		U
1634-04-4	Methyl tert-butyl ether	0.33		U
109-99-9	Tetrahydrofuran	0.92		U

MDL = Method Detection Limit

Q = Data qualifiers:
U = Compound analyzed for but not detected.
J = An estimated value for a compound detected at greater than or equal to the MDL but less than the lowest calibration standard.
B = Analyte is found in the associated blank

Comments:

IBM HUDSON VALLEY ENVIRONMENTAL LABORATORY
ELAP ID # 10426

TRACE ORGANICS ANALYSIS

FINAL REPORT PACKAGE REVIEW

CHAIN OF CUSTODY # 34990

SAMPLE IDENTIFICATION

LAB ID#	CUSTOMER ID	TRACE LAB ID
0209659	WELL 3	EF021125549

Client Name: M. WEST D/92DA Z/325
Client Sample ID: WELL 3
Lab Sample ID: 0209659
Date/Time Sampled: 11/25/2002 1215
Date Received: 11/25/2002
Location: IBM EAST FISHKILL
File No.: 1030A560
2nd CLIENT ID: WELL3

Report date: 12/05/2002
Project ID:
Matrix: LIQUID
Dilution Factor: 1.0
Date Analyzed: 11/27/2002
Method: 502.2
Batch No.: 7831
SAMPLER: J MAHONEY

CAS No.	COMPOUND	MDL ug/L	Result ug/L	Q
71-43-2	Benzene	0.12		U
108-86-1	Bromobenzene	0.26		U
74-97-5	Bromochloromethane	0.10		U
75-27-4	Bromodichloromethane	0.15		U
75-25-2	Bromoform	0.26		U
74-83-9	Bromomethane	0.16		U
104-51-8	n-Butylbenzene	0.12		U
135-98-8	sec-Butylbenzene	0.10		U
98-06-6	tert-Butylbenzene	0.11		U
56-23-5	Carbon Tetrachloride	0.11		U
108-90-7	Chlorobenzene	0.22		U
124-48-1	Chlorodibromomethane	0.21		U
75-00-3	Chloroethane	0.26		U
67-66-3	Chloroform	0.11		U
74-87-3	Chloromethane	0.10		U
95-49-8	2-Chlorotoluene	0.22		U
106-43-4	4-Chlorotoluene	0.42		U
96-12-8	1,2-Dibromo-3-Chloropropane	0.28		U
106-93-4	1,2-Dibromoethane	0.16		U
74-95-3	Dibromomethane	0.13		U
95-50-1	1,2-Dichlorobenzene	0.19		U
541-73-1	1,3-Dichlorobenzene	0.22		U
106-46-7	1,4-Dichlorobenzene	0.18		U
75-71-8	Dichlorodifluoromethane	0.15		U
75-34-3	1,1-Dichloroethane	0.12		U
107-06-2	1,2-Dichloroethane	0.07		U
75-35-4	1,1-Dichloroethene	0.12		U
156-59-4	cis-1,2-Dichloroethene	0.09		U
156-60-5	trans-1,2-Dichloroethene	0.09		U
78-87-5	1,2-Dichloropropane	0.10		U
142-28-9	1,3-Dichloropropane	0.18		U
590-20-7	2,2-Dichloropropane	0.28		U
563-58-6	1,1-Dichloropropene	0.07		U
10061-01-5	cis-1,3-Dichloropropene	0.10		U
10061-02-6	trans-1,3-Dichloropropene	0.14		U
100-41-4	Ethyl Benzene	0.08		U
87-68-3	Hexachlorobutadiene	0.18		U
98-82-8	Isopropylbenzene	0.10		U
99-87-6	4-Isopropyltoluene	0.11		U
75-09-2	Methylene Chloride	0.10		U
91-20-3	Naphthalene	0.59		U
103-65-1	Propylbenzene	0.10		U
100-42-5	Styrene	0.11		U

Client Name: M. WEST D/92DA Z/325
Client Sample ID: WELL 3
Lab Sample ID: 0209659
File No.: 1030A560

Report date: 12/05/2002
Project ID:
Matrix: LIQUID

CAS No.	COMPOUND	MDL ug/L	Result ug/L	Q
630-20-6	1,1,1,2-Tetrachloroethane	0.19		U
79-34-5	1,1,2,2-Tetrachloroethane	0.27		U
127-18-4	Tetrachloroethene	0.12		U
108-88-3	Toluene	0.07		U
87-61-6	1,2,3-Trichlorobenzene	0.26		U
120-82-1	1,2,4-Trichlorobenzene	0.18		U
71-55-6	1,1,1-Trichloroethane	0.10		U
79-00-5	1,1,2-Trichloroethane	0.19		U
79-01-6	Trichloroethene	0.09		U
75-69-4	Trichlorofluoromethane	0.29		U
96-18-4	1,2,3 Trichloropropane	0.28		U
95-63-6	1,2,4-Trimethylbenzene	0.11		U
108-67-8	1,3,5-Trimethylbenzene	0.15		U
75-01-4	Vinyl Chloride	0.17		U
95-47-6	o-Xylene	0.10		U
108-38-3/ 106-42-3	m&p-Xylene	0.16		U
	Non-EPA 502.2 Compounds			
67-64-1	Acetone	0.36		U
354-23-4	Freon 123A	0.15		U
76-13-1	Freon TF	0.13		U
1634-04-4	Methyl tert-butyl ether	0.33		U
109-99-9	Tetrahydrofuran	0.92		U

MDL = Method Detection Limit

Q = Data qualifiers:
U = Compound analyzed for but not detected.
J = An estimated value for a compound detected at greater than or equal to the MDL but less than the lowest calibration standard.
B = Analyte is found in the associated blank

Comments:

IBM HUDSON VALLEY ENVIRONMENTAL LABORATORY
ELAP ID # 10426

TRACE ORGANICS ANALYSIS

FINAL REPORT PACKAGE REVIEW

CHAIN OF CUSTODY # 34988

SAMPLE IDENTIFICATION

LAB ID#	CUSTOMER ID	TRACE LAB ID
0209656	WELL 1	EF021125546

SUBJECT: LAB NARRATIVE

DATA SET IDENTIFICATION: BATCH 7831

METHOD : 502.2

ANALYTICAL HOLD TIMES:

No problems noted.

SYSTEM BLANK:

No problems were noted.

QC CHECK SAMPLES:

Acetone is above limits.
Dichlorodifluoromethane is above limits.

MATRIX SPIKE RECOVERY:

Acetone is above limits.
Chloromethane is above limits.

REPLICATE ANALYSIS:

No problems were noted.

SURROGATES:

No problems were noted.

REFERENCE STANDARD:

Acetone is above limits.

COMMENTS:

Dichlorodifluoromethane was 1% below limits. The spike set and the reference show this not to be a system problem.
Acetone is not a method compound.

Approved by December 9, 2002

Client Name: M. WEST D/92DA Z/325
Client Sample ID: WELL 1
Lab Sample ID: 0209656
Date/Time Sampled: 11/25/2002 1205
Date Received: 11/25/2002
Location: IBM EAST FISHKILL
File No.: 1030A557
2nd CLIENT ID: WELL1

Report date: 12/05/2002
Project ID:
Matrix: LIQUID
Dilution Factor: 1.0
Date Analyzed: 11/27/2002
Method: 502.2
Batch No.: 7831
SAMPLER: J MAHONEY

CAS No.	COMPOUND	MDL ug/L	Result ug/L	Q
71-43-2	Benzene	0.12		U
108-86-1	Bromobenzene	0.26		U
74-97-5	Bromochloromethane	0.10		U
75-27-4	Bromodichloromethane	0.15		U
75-25-2	Bromoform	0.26		U
74-83-9	Bromomethane	0.16		U
104-51-8	n-Butylbenzene	0.12		U
135-98-8	sec-Butylbenzene	0.10		U
98-06-6	tert-Butylbenzene	0.11		U
56-23-5	Carbon Tetrachloride	0.11		U
108-90-7	Chlorobenzene	0.22		U
124-48-1	Chlorodibromomethane	0.21		U
75-00-3	Chloroethane	0.26		U
67-66-3	Chloroform	0.11		U
74-87-3	Chloromethane	0.10		U
95-49-8	2-Chlorotoluene	0.22		U
106-43-4	4-Chlorotoluene	0.42		U
96-12-8	1,2-Dibromo-3-Chloropropane	0.28		U
106-93-4	1,2-Dibromoethane	0.16		U
74-95-3	Dibromomethane	0.13		U
95-50-1	1,2-Dichlorobenzene	0.19		U
541-73-1	1,3-Dichlorobenzene	0.22		U
106-46-7	1,4-Dichlorobenzene	0.18		U
75-71-8	Dichlorodifluoromethane	0.15		U
75-34-3	1,1-Dichloroethane	0.12		U
107-06-2	1,2-Dichloroethane	0.07		U
75-35-4	1,1-Dichloroethene	0.12		U
156-59-4	cis-1,2-Dichloroethene	0.09		U
156-60-5	trans-1,2-Dichloroethene	0.09		U
78-87-5	1,2-Dichloropropane	0.10		U
142-28-9	1,3-Dichloropropane	0.18		U
590-20-7	2,2-Dichloropropane	0.28		U
563-58-6	1,1-Dichloropropene	0.07		U
10061-01-5	cis-1,3-Dichloropropene	0.10		U
10061-02-6	trans-1,3-Dichloropropene	0.14		U
100-41-4	Ethyl Benzene	0.08		U
87-68-3	Hexachlorobutadiene	0.18		U
98-82-8	Isopropylbenzene	0.10		U
99-87-6	4-Isopropyltoluene	0.11		U
75-09-2	Methylene Chloride	0.10		U
91-20-3	Naphthalene	0.59		U
103-65-1	Propylbenzene	0.10		U
100-42-5	Styrene	0.11		U

Client Name: M. WEST D/92DA Z/325
Client Sample ID: WELL 1
Lab Sample ID: 0209656
File No.: 1030A557

Report date: 12/05/2002
Project ID:
Matrix: LIQUID

CAS No.	COMPOUND	MDL ug/L	Result ug/L	Q
630-20-6	1,1,1,2-Tetrachloroethane	0.19		U
79-34-5	1,1,2,2-Tetrachloroethane	0.27		U
127-18-4	Tetrachloroethene	0.12		U
108-88-3	Toluene	0.07		U
87-61-6	1,2,3-Trichlorobenzene	0.26		U
120-82-1	1,2,4-Trichlorobenzene	0.18		U
71-55-6	1,1,1-Trichloroethane	0.10		U
79-00-5	1,1,2-Trichloroethane	0.19		U
79-01-6	Trichloroethene	0.09		U
75-69-4	Trichlorofluoromethane	0.29		U
96-18-4	1,2,3 Trichloropropane	0.28		U
95-63-6	1,2,4-Trimethylbenzene	0.11		U
108-67-8	1,3,5-Trimethylbenzene	0.15		U
75-01-4	Vinyl Chloride	0.17		U
95-47-6	o-Xylene	0.10		U
108-38-3/ 106-42-3	m&p-Xylene	0.16		U
	Non-EPA 502.2 Compounds			
67-64-1	Acetone	0.36		U
354-23-4	Freon 123A	0.15		U
76-13-1	Freon TF	0.13		U
1634-04-4	Methyl tert-butyl ether	0.33		U
109-99-9	Tetrahydrofuran	0.92		U

MDL = Method Detection Limit

Q = Data qualifiers:
U = Compound analyzed for but not detected.
J = An estimated value for a compound detected at greater than or equal to the MDL but less than the lowest calibration standard.
B = Analyte is found in the associated blank

Comments:

SEVERN TRENT SERVICES

STL Newburgh

CHAIN OF CUSTODY

315 Fullerton Avenue
Newburgh, NY 12550
TEL (845) 562-0890
FAX (845) 562-0841

CUSTOMER NAME: IBM EAST FISHKILL
ADDRESS: ROUTE 52
CITY, STATE, ZIP: HOPEWELL JCT. NY 12533
NAME OF CONTACT: Mandy Jouppi
PHONE NO.: (845) 894-5236
PROJECT LOCATION:
PROJECT NUMBER / PO NO.: BSAP4800003612

REPORT TYPE
STANDARD ☑ ISRA ☐
NJ REG ☐
NYASP A ☐ B ☐ CLP ☐
OTHER ____

TURNAROUND
☑ NORMAL 14 days
☐ QUICK ____
☐ VERBAL ____

REPORT # (Lab Use Only)
21871S
SAMPLE TEMP. 3.3 C
SAMPLE REC'D ON ICE Y ____ N ____
pH CHECK Y ____ N ____
REVIEWED BY: ____

NY PUBLIC WATER SUPPLIES
SOURCE ID ____
ELRP TYPE ____
FEDERAL ID ____

Matrix
DW = DRINKING WATER S = SOIL O = OIL
WW = WASTE WATER SL = SLUDGE GW = GROUND WATER

NOTE: SAMPLE TEMPERATURE UPON RECEIPT MUST BE 4° ± 2°C.

STL #	SAMPLING DATE	TIME (AM/PM)	COMP	GRAB	MATRIX	CLIENT I.D.	Total Number of Containers	40ml Glass HCL	Liter Amber Sulfuric Acid	Liter Amber Organic Washed	Liter Plastic Nitric Acid	Liter Plastic Sodium Hydroxide	Liter Plastic	Liter Plastic Sulfuric Acid	250ml Plastic	125ml Plastic Sterile	250ml Amber	2 oz. Qorpak	ANALYSIS REQUESTED
13	8/20	11:28		✓	DW	02061611		1-125 mL HNO3											Sb
14	8/22	10:09		✓	DW	02061605		1-125 mL HNO3											Sb
15	8/27	1:25pm		✓	DW	02067161		1-125 mL HNO3											Sb
16	8/27	1:55pm		✓	DW	02067162		1-125 mL HNO3											Sb
17	8/28	9:35		✓	DW	02067163		1-125 mL HNO3											Sb
18	8/28	9:35		✓	DW	02067164		1-125 mL HNO3											Sb
19	11/25	12:05pm		✓	DW	02096056		1-125 mL HNO3											Pb, Sb, Se, Tl
20	11/25	11:30		✓	DW	02096057		1-125 mL HNO3											Pb, Sb, Se, Tl
21	11/25	11:45		✓	DW	02096058		1-125 mL HNO3											Pb, Sb, Se, Tl
22	11/25	12:15pm		✓	DW	02096059		1-125 mL HNO3											Pb, Sb, Se, Tl

SAMPLES SUBMITTED FOR ANALYSIS WILL BE SUBJECTED TO THE STL TERMS AND CONDITIONS OF SALE (SHORT FORM) UNLESS ALTERNATE TERMS ARE AGREED IN WRITING.

	COMPANY	DATE	TIME		COMPANY	DATE	TIME
RELINQUISHED BY	IBM/CAS	12-2-02	12:0	RECEIVED BY			
SAMPLED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
					STL	12-2-02	12:15

COMMENTS: ALL METALS ANALYSIS BY GFAA

LABORATORY TEST RESULTS

Job Number: 218715

Date: 12/27/2002

CUSTOMER: IBM Corporation PROJECT: BSAP4800003612 ATTN: Mandy Jouppi Z4A1

Customer Sample ID: 0209656
Date Sampled.....: 11/25/2002
Time Sampled.....: 12:05
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 218715-19
Date Received.....: 12/02/2002
Time Received.....: 12:15

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
EPA 200.9	Acid Digestion, (GFAA)	N/A				Text		tab
EPA 180.1	Turbidity Assessment - Metals	Negative				Pos/Neg		mwh
SM18 3113B	GFAA Metals Analysis							
	Selenium (Se)	5.0	U		5.0	ug/L	12/19/02	mwh
	Antimony (Sb)	3.0	U		3.0	ug/L	12/13/02	mwh
	Lead (Pb)	1.0	U		1.0	ug/L	12/19/02	mwh
EPA 200.9	Metals Analysis (GFAA)							
	Thallium (Tl)	7.5	U		7.5	ug/L	12/20/02	mwh

* In Description = Dry Wgt.

LABORATORY TEST RESULTS

Job Number: 218715 Date: 12/27/2002

CUSTOMER: IBM Corporation PROJECT: BSAP480000361Z ATTN: Mandy Jouppi Z4A1

Customer Sample ID: 0209657
Date Sampled.....: 11/25/2002
Time Sampled.....: 11:30
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 218715-20
Date Received.....: 12/02/2002
Time Received.....: 12:15

TEST METHOD	* PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
EPA 200.9	Acid Digestion, (GFAA)	N/A				Text		tab
EPA 180.1	Turbidity Assessment - Metals	Negative				Pos/Neg		mwh
SM18 3113B	GFAA Metals Analysis							
	Selenium (Se)	5.0	U		5.0	ug/L	12/19/02	mwh
	Antimony (Sb)	3.0	U		3.0	ug/L	12/13/02	mwh
	Lead (Pb)	1.0	U		1.0	ug/L	12/19/02	mwh
EPA 200.9	Metals Analysis (GFAA)							
	Thallium (Tl)	1.5	U		1.5	ug/L	12/20/02	mwh

* In Description = Dry Wgt.

LABORATORY TEST RESULTS

Job Number: 218715

Date: 12/27/2002

CUSTOMER: IBM Corporation | PROJECT: BSAP4800003612 | ATTN: Mandy Jouppi Z4A1

Customer Sample ID: 0209658
Date Sampled.....: 11/25/2002
Time Sampled.....: 11:45
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 218715-21
Date Received.....: 12/02/2002
Time Received.....: 12:15

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
EPA 200.9	Acid Digestion, (GFAA)	N/A				Text		tab
EPA 180.1	Turbidity Assessment - Metals	Negative				Pos/Neg		mwh
SM18 3113B	GFAA Metals Analysis							
	Selenium (Se)	5.0	U		5.0	ug/L	12/19/02	mwh
	Antimony (Sb)	3.0	U		3.0	ug/L	12/13/02	mwh
	Lead (Pb)	1.0	U		1.0	ug/L	12/19/02	mwh
EPA 200.9	Metals Analysis (GFAA)							
	Thallium (Tl)	1.5	U		1.5	ug/L	12/20/02	mwh

* In Description = Dry Wgt.

LABORATORY TEST RESULTS

Job Number: 218715

Date: 12/27/2002

CUSTOMER: IBM Corporation PROJECT: BSAP4800003612 ATTN: Mandy Jouppi Z4A1

Customer Sample ID: 0209659
Date Sampled.....: 11/25/2002
Time Sampled.....: 12:15
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 218715-22
Date Received.....: 12/02/2002
Time Received.....: 12:15

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
EPA 200.9	Acid Digestion, (GFAA)	N/A				Text		tab
EPA 180.1	Turbidity Assessment - Metals	Negative				Pos/Neg		mwh
SM18 3113B	GFAA Metals Analysis							
	Selenium (Se)	5.0	U		5.0	ug/L	12/19/02	mwh
	Antimony (Sb)	3.0	U		3.0	ug/L	12/13/02	mwh
	Lead (Pb)	1.0	U		1.0	ug/L	12/19/02	mwh
EPA 200.9	Metals Analysis (GFAA)							
	Thallium (Tl)	1.5	U		1.5	ug/L	12/20/02	mwh

* In Description = Dry Wgt.

water samples

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JAN 17 2003

SMITH LABORATORY

ENVIRONMENTAL TESTING
4 SCENIC DRIVE & RT. 9
HYDE PARK, NEW YORK 12538
(845) 229-6536

CERTIFICATE OF ANALYSIS

ENVIRONMENTAL HEALTH
DUTCHESS CO. HEALTH DEPT.

Client: Poughkeepsie Townwide Water District
Bob Kurdi
1 Overocker Rd.
Poughkeepsie NY 12603

PO #

POSTED

Sample Type: Water
Client Project Name: Frank Brothers Wells
Sample Location: Well #1
Order comment:
Order ID: 16788
Sample Number: 30479

Sample Collected By: D. Hammond for Smith
Date/Time sample collected: 11/20/02 11:30
Date/Time sample received: 11/20/02 13:10
Received by: Kelly
Sample Comment: Temp = 15.5 C for Tc

Parameter:	Test Result	Units*	Test Method	MDL	Test Date/Time		Tech
Antimony	< 0.003	mg/L	EPA 200.9	0.003	12/6/02		LAE
Arsenic	< 0.005	mg/L	EPA 200.9	0.005	12/3/02		LAE
Barium	0.023	mg/L	SM18 3111-D	0.001	11/26/02		LAE
Beryllium	< 0.001	mg/L	EPA 200.7		11/26/02		LAE
Cadmium	< 0.002	mg/L	EPA 200.7		11/26/02		LAE
Calcium	65.9	mg/L	EPA 200.7		11/26/02		LAE
chloride	62	mg/L	SM18 4500 Cl-B	5	11/21/02		DR
Chromium	< 0.002	mg/L	EPA 200.7		11/26/02		LAE
Color	< 5,pH=7.7	PtCo	SM18 2120-B	5	11/20/02	16:30	DR
Cyanide, Free	< 0.01	mg/L	SM18 4500 CN E	0.01	11/26/02		DR
Fluoride	< 0.2	mg/L	SM18 4500 F-C		11/21/02		DR
Hardness, as CaCO3	236	mg/L	EPA 200.7		11/26/02		LAE
iron	< 0.004	mg/L	EPA 200.7	0.004	11/26/02		LAE
Magnesium	17.4	mg/L	EPA 200.7		11/26/02		LAE
Manganese	< 0.003	mg/L	EPA 200.7		11/26/02		LAE
Mercury	< 0.0004	mg/L	EPA 245.1		12/5/02		LAE
Nickel	< 0.004	mg/L	EPA 200.7		11/26/02		LAE
Nitrate-N	0.68	mg/L	SM18 4500 NO3-D	0.2	11/22/02		DR
Nitrite-Nitrogen	< 0.01	mg/L	SM18 4500 NO2-B	0.01	11/21/02	17:00	DR
Odor	ND @44.5C	T.O.N.	EPA 140.1	1	11/20/02	16:30	DR

SMITH LABORATORY

ENVIRONMENTAL TESTING
4 SCENIC DRIVE & RT. 9
HYDE PARK, NEW YORK 12538
(845) 229-6536

CERTIFICATE OF ANALYSIS

Client: Poughkeepsie Townwide Water District
Bob Kurdi
1 Overocker Rd.
Poughkeepsie NY 12603 **PO #**

Sample Type: Water
Client Project Name: Frank Brothers Wells
Sample Location: Well #1
Order comment:
Order ID: 16788
Sample Number: 30479

Selenium	< 0.002	mg/L	EPA 200.9	0.002	12/5/02	LAE
Silver	< 0.002	mg/L	EPA 200.7		11/26/02	LAE
Sodium	36.4	mg/L	EPA 200.7		11/26/02	
Sulfate	31	mg/L	EPA 375.4	2	11/25/02	DR
Thallium	< 0.001	mg/L	EPA 200.9	0.001	11/26/02	LAE
Zinc	< 0.004	mg/L	EPA 200.7		11/26/02	LAE

Results Comment:

Reviewed by: Anne G. Smith, Laboratory Director, ELAP Lab ID #10924 13-Jan-03

*Key: mg/L = milligrams per liter ug/L = micrograms per liter mg/kg = milligrams per kilogram dry weight mL/L=Milliliters per Liter < = less than J = result estimated below quantitation limit NTU = Nephelometric Turbidity Units PtCo = Platinum Colbalt Units SU = Standard pH Units TON = Threshold Odor Number MCL=New York State Maximum Contaminant Level MDL = Method Detection Limit umho/cm=micromhos per centimeter ND=Not Detected **Analysis performed by sub-contract laboratory; ELAP Lab ID listed under "Tech" Est=Estimated Value

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SMITH LABORATORY

ENVIRONMENTAL TESTING
4 SCENIC DRIVE & RT. 9
HYDE PARK, NEW YORK 12538
(845) 229-6536

WATER ANALYSIS REPORT

Client: Poughkeepsie Townwide Water District
Bob Kurdi
1 Overrocker Road
Poughkeepsie, NY 12603

Sample Identification:	Frank Bros. Wells, Overlook Rd., Poughkeepsie, NY
Sample Type:	drinking water supply
Sampling Point:	Well #1
Sample Lab No:	30479
Sample Collected By:	D. Hammond for Smith Lab
Date Sampled:	11-20-02
Date Received:	11-20-02
Date POCs Analyzed:	11-27-02 Test method: EPA 502.2

POC+MTBE

Analyte	Principal Organic Contaminant Test Result*	MCL**
Benzene	< 0.5 ug/L	5 ug/L
Bromobenzene	< 0.5 ug/L	5 ug/L
Bromochloromethane	< 0.5 ug/L	5 ug/L
Bromomethane	< 0.5 ug/L	5 ug/L
n-Butylbenzene	< 0.5 ug/L	5 ug/L
sec-Butylbenzene	< 0.5 ug/L	5 ug/L
tert-Butylbenzene	< 0.5 ug/L	5 ug/L
Carbon Tetrachloride	< 0.5 ug/L	5 ug/L
Chlorobenzene	< 0.5 ug/L	5 ug/L
Chloroethane	< 0.5 ug/L	5 ug/L
Chloromethane	< 0.5 ug/L	5 ug/L
2-Chlorotoluene	< 0.5 ug/L	5 ug/L
4-Chlorotoluene	< 0.5 ug/L	5 ug/L
Dibromomethane	< 0.5 ug/L	5 ug/L
1,2-Dichlorobenzene	< 0.5 ug/L	5 ug/L
1,3-Dichlorobenzene	< 0.5 ug/L	5 ug/L
1,4-Dichlorobenzene	< 0.5 ug/L	5 ug/L
Dichlorodifluoromethane	< 0.5 ug/L	5 ug/L
1,1-Dichloroethane	< 0.5 ug/L	5 ug/L
1,2-Dichloroethane	< 0.5 ug/L	5 ug/L
1,1-Dichloroethene	< 0.5 ug/L	5 ug/L
cis-1,2-Dichloroethene	< 0.5 ug/L	5 ug/L
trans-1,2-Dichloroethene	< 0.5 ug/L	5 ug/L
1,2-Dichloropropane	< 0.5 ug/L	5 ug/L
1,3-Dichloropropane	< 0.5 ug/L	5 ug/L
2,2-Dichloropropane	< 0.5 ug/L	5 ug/L
1,1-Dichloropropene	< 0.5 ug/L	5 ug/L
cis-1,3-Dichloropropene	< 0.5 ug/L	5 ug/L
trans-1,3-Dichloropropene	< 0.5 ug/L	5 ug/L
Ethylbenzene	< 0.5 ug/L	5 ug/L
Hexachlorobutadiene	< 0.5 ug/L	5 ug/L
Isopropylbenzene	< 0.5 ug/L	5 ug/L
p-Isopropyltoluene (p-Cymene)	< 0.5 ug/L	5 ug/L
Methylene Chloride	< 0.5 ug/L	5 ug/L
n-Propylbenzene	< 0.5 ug/L	5 ug/L

SMITH LABORATORY

ENVIRONMENTAL TESTING
4 SCENIC DRIVE & RT. 9
HYDE PARK, NEW YORK 12538
(845) 229-6536

WATER ANALYSIS REPORT

Client: Town of Poughkeepsie
Sample Identification: Frank Bros. Wells/Well #1
Sample Type: drinking water
Sample Lab No: 30479
Date Sampled: 11-20-02
Date Received: 11-20-02

Analyte	Principal Organic Contaminant Test Result*	MCL**
Styrene	< 0.5 ug/L	5 ug/L
1,1,1,2-Tetrachloroethane	< 0.5 ug/L	5 ug/L
1,1,2,2-Tetrachloroethane	< 0.5 ug/L	5 ug/L
Tetrachloroethene	< 0.5 ug/L	5 ug/L
Toluene	< 0.5 ug/L	5 ug/L
1,2,3-Trichlorobenzene	< 0.5 ug/L	5 ug/L
1,2,4-Trichlorobenzene	< 0.5 ug/L	5 ug/L
1,1,1-Trichloroethane	< 0.5 ug/L	5 ug/L
1,1,2-Trichloroethane	< 0.5 ug/L	5 ug/L
Trichloroethene	< 0.5 ug/L	5 ug/L
Trichlorofluoromethane	< 0.5 ug/L	5 ug/L
1,2,3-Trichloropropane	< 0.5 ug/L	5 ug/L
1,2,4-Trimethylbenzene	< 0.5 ug/L	5 ug/L
1,3,5-Trimethylbenzene	< 0.5 ug/L	5 ug/L
p/m-Xylene	< 0.5 ug/L	5 ug/L
o-Xylene	< 0.5 ug/L	5 ug/L
Vinyl Chloride	< 0.5 ug/L	2 ug/L
Methyl tert-Butyl Ether (MTBE)	< 1.0 ug/L	50 ug/L

*results expressed as micrograms per liter
**MCL = New York State Maximum Contaminant Level

Anne G. Smith, Laboratory Director
NYSHD ELAP Lab ID #10924

2M LABS, INC.

, Broad Hollow Road, Melville NY 11747
,31) 694-3040. FAX: (631) 420-8436 NYSDOH ID # 10478

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LABORATORY RESULTS

SMITH LABORATORY
50 SCENIC DR. & RT. 9
HYDE PARK, NY 12538
Attn To : JOHN EISENHART

Lab No. : 0211579-001A

Sample Information...
Type : Potable Water
Origin : Dist.
Routine

POSTED

Federal ID 1302812
Collected : 11/20/02 11:30:00 AM
Received : 11/21/02 9:00:00 AM
Collected By : Client
Copies To : John Eisenhart

Point No :
Location :

Client ID. : WELL #1

Parameter(s)	Results	Units	Limit	Method Number	Analyzed
1,2-Dibromoethane	< 0.02	µg/L	0.05	E504.1	12/3/02 12:09:00 PM
1,2-Dibromo-3-chloropropane	< 0.02	µg/L	0.2	E504.1	12/3/02 12:09:00 PM
Aldrin	< 0.025	µg/L	5	E505	11/28/02 7:10:00 AM
Lindane	< 0.025	µg/L	0.2	E505	11/28/02 7:10:00 AM
Heptachlor	< 0.025	µg/L	0.4	E505	11/28/02 7:10:00 AM
Heptachlor epoxide	< 0.025	µg/L	0.2	E505	11/28/02 7:10:00 AM
Dieldrin	< 0.050	µg/L	2	E505	11/28/02 7:10:00 AM
Endrin	< 0.050	µg/L	2	E505	11/28/02 7:10:00 AM
Methoxychlor	< 0.25	µg/L	40	E505	11/28/02 7:10:00 AM
Chlordane	< 0.50	µg/L	2	E505	11/28/02 7:10:00 AM
Total PCBs	< 0.50	µg/L	0.5	E505	11/28/02 7:10:00 AM
Toxaphene	< 2.5	µg/L	3	E505	11/28/02 7:10:00 AM
Dalapon	< 1.3	µg/L	200	E515.1	12/3/02 2:31:00 AM
Dicamba	< 0.08	µg/L	50	E515.1	12/3/02 2:31:00 AM
2,4-D	< 0.20	µg/L	50	E515.1	12/3/02 2:31:00 AM
Pentachlorophenol	< 0.10	µg/L	1	E515.1	12/3/02 2:31:00 AM
2,4,5-TP (Silvex)	< 0.05	µg/L	10	E515.1	12/3/02 2:31:00 AM
Dinoseb	< 0.20	µg/L	7	E515.1	12/3/02 2:31:00 AM
Picloram	< 1.4	µg/L	500	E515.1	12/3/02 2:31:00 AM
Aldicarb sulfoxide	< 1.0	µg/L	4	E531.1	12/7/02 10:26:00 PM
Aldicarb sulfone	< 1.0	µg/L	2	E531.1	12/7/02 10:26:00 PM
Oxamyl	< 1.0	µg/L	200	E531.1	12/7/02 10:26:00 PM
Methomyl	< 1.0	µg/L	50	E531.1	12/7/02 10:26:00 PM
3-Hydroxycarbofuran	< 1.0	µg/L	50	E531.1	12/7/02 10:26:00 PM
Aldicarb	< 1.0	µg/L	3	E531.1	12/7/02 10:26:00 PM
Carbofuran	< 1.0	µg/L	40	E531.1	12/7/02 10:26:00 PM
Carbaryl	< 1.0	µg/L	50	E531.1	12/7/02 10:26:00 PM
Hexachlorocyclopentadiene	< 0.64	µg/L	50	E525.2	12/12/02 1:07:00 AM
Propachlor	< 1.0	µg/L	50	E525.2	12/12/02 1:07:00 AM
Hexachlorobenzene	< 0.25	µg/L	1	E525.2	12/12/02 1:07:00 AM
Simazine	< 0.50	µg/L	4	E525.2	12/12/02 1:07:00 AM
Atrazine	< 0.50	µg/L	3	E525.2	12/12/02 1:07:00 AM
Metribuzin	< 0.50	µg/L	50	E525.2	12/12/02 1:07:00 AM
Alachlor	< 1.0	µg/L	2	E525.2	12/12/02 1:07:00 AM
Metolachlor	< 1.0	µg/L	50	E525.2	12/12/02 1:07:00 AM
Butachlor	< 1.0	µg/L	50	E525.2	12/12/02 1:07:00 AM
bis(2-Ethylhexyl)adipate	< 1.0	µg/L	400	E525.2	12/12/02 1:07:00 AM
Bis(2-ethylhexyl)phthalate	< 3.0	µg/L	6	E525.2	12/12/02 1:07:00 AM

Result(s) reported meet(s) Regulatory Limit(s).
Result(s) flagged with * Exceed Regulatory Limit(s). Limit noted.

Date Reported : 12/17/02

Joann M. Slavin
Laboratory Manager

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SMITH LABORATORY

ENVIRONMENTAL TESTING
4 SCENIC DRIVE & RT. 9
HYDE PARK, NEW YORK 12538
(845) 229-6536

RECEIVED
JAN 17 2003
ENVIRONMENTAL HEALTH
DUTCHESS CO. HEALTH DEPT.

CERTIFICATE OF ANALYSIS

POSTED

Client: Poughkeepsie Townwide Water District
Bob Kurdi
1 Overocker Rd.
Poughkeepsie NY 12603 **PO #**

Sample Type: Water
Client Project Name: Frank Brothers Wells
Sample Location: Well #2
Order comment:
Order ID: 16788
Sample Number: 30480

Sample Collected By: D. Hammond for Smith
Date/Time sample collected: 11/20/02 11:20
Date/Time sample received: 11/20/02 13:10
Received by: Kelly
Sample Comment: Temp = 15.5 C for TC

Parameter:	Test Result	Units*	Test Method	MDL	Test Date/Time		Tech
Antimony	< 0.003	mg/L	EPA 200.9	0.003	12/6/02		LAE
Arsenic	< 0.005	mg/L	EPA 200.9	0.005	12/3/02		LAE
Barium	0.017	mg/L	SM18 3111-D	0.001	11/26/02		LAE
Beryllium	< 0.001	mg/L	EPA 200.7		11/26/02		LAE
Cadmium	< 0.002	mg/L	EPA 200.7		11/26/02		LAE
Calcium	57.3	mg/L	EPA 200.7		11/26/02		LAE
chloride	60	mg/L	SM18 4500 Cl-B	5	11/21/02		DR
Chromium	< 0.002	mg/L	EPA 200.7		11/26/02		LAE
Color	< 5,pH=7.4	PtCo	SM18 2120-B	5	11/20/02	16:30	DR
Cyanide, Free	< 0.01	mg/L	SM18 4500 CN E	0.01	11/26/02		DR
Fluoride	< 0.2	mg/L	SM18 4500 F-C		11/21/02		DR
Hardness, as CaCO3	206	mg/L	EPA 200.7		11/26/02		LAE
iron	0.020	mg/L	EPA 200.7	0.004	11/26/02		LAE
Magnesium	15.4	mg/L	EPA 200.7		11/26/02		LAE
Manganese	0.003	mg/L	EPA 200.7		11/26/02		LAE
Mercury	< 0.0004	mg/L	EPA 245.1		12/5/02		LAE
Nickel	< 0.004	mg/L	EPA 200.7		11/26/02		LAE
Nitrate-N	0.58	mg/L	SM18 4500 NO3-D	0.2	11/22/02		DR
Nitrite-Nitrogen	< 0.01	mg/L	SM18 4500 NO2-B	0.01	11/21/02	17:00	DR
Odor	ND @44.5C	T.O.N.	EPA 140.1	1	11/20/02	16:45	DR

SMITH LABORATORY

ENVIRONMENTAL TESTING
4 SCENIC DRIVE & RT. 9
HYDE PARK, NEW YORK 12538
(845) 229-6536

CERTIFICATE OF ANALYSIS

Client: Poughkeepsie Townwide Water District
Bob Kurdi
1 Overocker Rd.
Poughkeepsie NY 12603

PO #

Sample Type: Water
Client Project Name: Frank Brothers Wells
Sample Location: Well #2
Order comment:
Order ID: 16788
Sample Number: 30480

Selenium	< 0.002	mg/L	EPA 200.9	0.002	12/5/02	LAE
Silver	< 0.002	mg/L	EPA 200.7		11/25/02	LAE
Sodium	34.0	mg/L	EPA 200.7		11/25/02	LAE
Sulfate	30	mg/L	EPA 375.4	2	11/25/02	DR
Thallium	< 0.001	mg/L	EPA 200.9	0.001	11/26/02	LAE
Zinc	0.004	mg/L	EPA 200.7		11/26/02	LAE

Results Comment:

Reviewed by: Anne G. Smith, Laboratory Director, ELAP Lab ID #10924 13-Jan-03

*Key: mg/L = milligrams per liter ug/L = micrograms per liter mg/kg = milligrams per kilogram dry weight mL/L=Milliliters per Liter < = less than J = result estimated below quantitation limit NTU = Nephelometric Turbidity Units PtCo = Platinum Colbalt Units SU = Standard pH Units TON = Threshold Odor Number MCL=New York State Maximum Contaminant Level MDL = Method Detection Limit umho/cm=micromhos per centimeter ND=Not Detected **Analysis performed by sub-contract laboratory; ELAP Lab ID listed under "Tech" Est=Estimated Value

SMITH LABORATORY
ENVIRONMENTAL TESTING
4 SCENIC DRIVE & RT. 9
HYDE PARK, NEW YORK 12538
(845) 229-6536

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WATER ANALYSIS REPORT

Client: Poughkeepsie Townwide Water District
Bob Kurdi
1 Overocker Road
Poughkeepsie, NY 12603

Sample Identification:	Frank Brothers Wells, Overlook Rd., Poughkeepsie, NY
Sample Type:	drinking water supply
Sampling Point:	Well 2 POC & BAHbl
Sample Lab No:	30480
Sample Collected By:	D. Hammond for Smith Lab
Date Sampled:	11-20-02
Date Received:	11-20-02
Date POCs Analyzed:	11-27-02 Test method: EPA 502.2

Analyte	Principal Organic Contaminant Test Result*	MCL**
Benzene	< 0.5 ug/L	5 ug/L
Bromobenzene	< 0.5 ug/L	5 ug/L
Bromochloromethane	< 0.5 ug/L	5 ug/L
Bromomethane	< 0.5 ug/L	5 ug/L
n-Butylbenzene	< 0.5 ug/L	5 ug/L
sec-Butylbenzene	< 0.5 ug/L	5 ug/L
tert-Butylbenzene	< 0.5 ug/L	5 ug/L
Carbon Tetrachloride	< 0.5 ug/L	5 ug/L
Chlorobenzene	< 0.5 ug/L	5 ug/L
Chloroethane	< 0.5 ug/L	5 ug/L
Chloromethane	< 0.5 ug/L	5 ug/L
2-Chlorotoluene	< 0.5 ug/L	5 ug/L
4-Chlorotoluene	< 0.5 ug/L	5 ug/L
Dibromomethane	< 0.5 ug/L	5 ug/L
1,2-Dichlorobenzene	< 0.5 ug/L	5 ug/L
1,3-Dichlorobenzene	< 0.5 ug/L	5 ug/L
1,4-Dichlorobenzene	< 0.5 ug/L	5 ug/L
Dichlorodifluoromethane	< 0.5 ug/L	5 ug/L
1,1-Dichloroethane	< 0.5 ug/L	5 ug/L
1,2-Dichloroethane	< 0.5 ug/L	5 ug/L
1,1-Dichloroethene	< 0.5 ug/L	5 ug/L
cis-1,2-Dichloroethene	< 0.5 ug/L	5 ug/L
trans-1,2-Dichloroethene	< 0.5 ug/L	5 ug/L
1,2-Dichloropropane	< 0.5 ug/L	5 ug/L
1,3-Dichloropropane	< 0.5 ug/L	5 ug/L
2,2-Dichloropropane	< 0.5 ug/L	5 ug/L
1,1-Dichloropropene	< 0.5 ug/L	5 ug/L
cis-1,3-Dichloropropene	< 0.5 ug/L	5 ug/L
trans-1,3-Dichloropropene	< 0.5 ug/L	5 ug/L
Ethylbenzene	< 0.5 ug/L	5 ug/L
Hexachlorobutadiene	< 0.5 ug/L	5 ug/L
Isopropylbenzene	< 0.5 ug/L	5 ug/L
p-Isopropyltoluene (p-Cymene)	< 0.5 ug/L	5 ug/L
Methylene Chloride	< 0.5 ug/L	5 ug/L
n-Propylbenzene	< 0.5 ug/L	5 ug/L

SMITH LABORATORY

ENVIRONMENTAL TESTING
4 SCENIC DRIVE & RT. 9
HYDE PARK, NEW YORK 12538
(845) 229-6536

WATER ANALYSIS REPORT

Client:	Town of Poughkeepsie
Sample Identification:	Frank Brothers Wells/Well #2
Sample Type:	drinking water
Sample Lab No:	30480
Date Sampled:	11-20-02
Date Received:	11-20-02

Analyte	Principal Organic Contaminant Test Result*	MCL**
Styrene	< 0.5 ug/L	5 ug/L
1,1,1,2-Tetrachloroethane	< 0.5 ug/L	5 ug/L
1,1,2,2-Tetrachloroethane	< 0.5 ug/L	5 ug/L
Tetrachloroethene	< 0.5 ug/L	5 ug/L
Toluene	< 0.5 ug/L	5 ug/L
1,2,3-Trichlorobenzene	< 0.5 ug/L	5 ug/L
1,2,4-Trichlorobenzene	< 0.5 ug/L	5 ug/L
1,1,1-Trichloroethane	< 0.5 ug/L	5 ug/L
1,1,2-Trichloroethane	< 0.5 ug/L	5 ug/L
Trichloroethene	< 0.5 ug/L	5 ug/L
Trichlorofluoromethane	< 0.5 ug/L	5 ug/L
1,2,3-Trichloropropane	< 0.5 ug/L	5 ug/L
1,2,4-Trimethylbenzene	< 0.5 ug/L	5 ug/L
1,3,5-Trimethylbenzene	< 0.5 ug/L	5 ug/L
p/m-Xylene	< 0.5 ug/L	5 ug/L
o-Xylene	< 0.5 ug/L	5 ug/L
Vinyl Chloride	< 0.5 ug/L	2 ug/L
Methyl tert-Butyl Ether (MTBE)	< 1.0 ug/L	50 ug/L

*results expressed as micrograms per liter
**MCL = New York State Maximum Contaminant Level

Anne G. Smith, Laboratory Director
NYSHD ELAP Lab ID #10924

2M LABS, INC.
5 Broad Hollow Road, Melville NY 11747
(631) 694-3040 . FAX: (631) 420-8436 NYSDOH ID # 10478

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LABORATORY RESULTS

SMITH LABORATORY
50 SCENIC DR. & RT. 9
HYDE PARK, NY 12538
Attn To : JOHN EISENHART

Lab No. : 0211579-002A

Sample Information...
Type : Potable Water
Origin : Dist.
Routine

Federal ID 1302812
Collected : 11/20/02 11:20:00 AM
Received : 11/21/02 9:00:00 AM
Collected By : Client
Copies To : John Eisenhart

Point No :
Location :

Client ID. : WELL #2

Parameter(s)	Results	Units	Limit	Method Number	Analyzed
1,2-Dibromoethane	< 0.02	µg/L	0.05	E504.1	12/3/02 12:33:00 PM
1,2-Dibromo-3-chloropropane	< 0.02	µg/L	0.2	E504.1	12/3/02 12:33:00 PM
Aldrin	< 0.025	µg/L	5	E505	11/28/02 7:50:00 AM
Lindane	< 0.025	µg/L	0.2	E505	11/28/02 7:50:00 AM
Heptachlor	< 0.025	µg/L	0.4	E505	11/28/02 7:50:00 AM
Heptachlor epoxide	< 0.025	µg/L	0.2	E505	11/28/02 7:50:00 AM
Dieldrin	< 0.050	µg/L	2	E505	11/28/02 7:50:00 AM
Endrin	< 0.050	µg/L	2	E505	11/28/02 7:50:00 AM
Methoxychlor	< 0.25	µg/L	40	E505	11/28/02 7:50:00 AM
Chlordane	< 0.50	µg/L	2	E505	11/28/02 7:50:00 AM
Total PCBs	< 0.50	µg/L	0.5	E505	11/28/02 7:50:00 AM
Toxaphene	< 2.5	µg/L	3	E505	11/28/02 7:50:00 AM
Dalapon	< 1.3	µg/L	200	E515.1	12/3/02 3:10:00 AM
Dicamba	< 0.08	µg/L	50	E515.1	12/3/02 3:10:00 AM
2,4-D	< 0.20	µg/L	50	E515.1	12/3/02 3:10:00 AM
Pentachlorophenol	< 0.10	µg/L	1	E515.1	12/3/02 3:10:00 AM
2,4,5-TP (Silvex)	< 0.05	µg/L	10	E515.1	12/3/02 3:10:00 AM
Dinoseb	< 0.20	µg/L	7	E515.1	12/3/02 3:10:00 AM
Picloram	< 1.4	µg/L	500	E515.1	12/3/02 3:10:00 AM
Aldicarb sulfoxide	< 1.0	µg/L	4	E531.1	12/7/02 11:29:00 PM
Aldicarb sulfone	< 1.0	µg/L	2	E531.1	12/7/02 11:29:00 PM
Oxamyl	< 1.0	µg/L	200	E531.1	12/7/02 11:29:00 PM
Methomyl	< 1.0	µg/L	50	E531.1	12/7/02 11:29:00 PM
3-Hydroxycarbofuran	< 1.0	µg/L	50	E531.1	12/7/02 11:29:00 PM
Aldicarb	< 1.0	µg/L	3	E531.1	12/7/02 11:29:00 PM
Carbofuran	< 1.0	µg/L	40	E531.1	12/7/02 11:29:00 PM
Carbaryl	< 1.0	µg/L	50	E531.1	12/7/02 11:29:00 PM
Hexachlorocyclopentadiene	< 0.64	µg/L	50	E525.2	12/16/02 6:25:00 PM
Propachlor	< 1.0	µg/L	50	E525.2	12/16/02 6:25:00 PM
Hexachlorobenzene	< 0.25	µg/L	1	E525.2	12/16/02 6:25:00 PM
Simazine	< 0.50	µg/L	4	E525.2	12/16/02 6:25:00 PM
Atrazine	< 0.50	µg/L	3	E525.2	12/16/02 6:25:00 PM
Metribuzin	< 0.50	µg/L	50	E525.2	12/16/02 6:25:00 PM
Alachlor	< 1.0	µg/L	2	E525.2	12/16/02 6:25:00 PM
Metolachlor	< 1.0	µg/L	50	E525.2	12/16/02 6:25:00 PM
Butachlor	< 1.0	µg/L	50	E525.2	12/16/02 6:25:00 PM
bis(2-Ethylhexyl)adipate	< 1.0	µg/L	400	E525.2	12/16/02 6:25:00 PM
Bis(2-ethylhexyl)phthalate	< 3.0	µg/L	6	E525.2	12/16/02 6:25:00 PM

Result(s) reported meet(s) Regulatory Limit(s).
Result(s) flagged with * Exceed Regulatory Limit(s). Limit noted.

Date Reported : 12/17/02

Joann M. Slavin
Laboratory Manager

2M LABS, INC.
5 Broad Hollow Road, Melville NY 11747
(631) 694-3040 . FAX: (631) 420-8436 NYSDOH ID # 10478

LABORATORY RESULTS

SMITH LABORATORY
50 SCENIC DR. & RT. 9
HYDE PARK, NY 12538
Attn To : JOHN EISENHART

Lab No. : **0211579-002A**

Sample Information...
Type : Potable Water
Origin : Dist.
Routine

Federal ID 1302812
Collected : 11/20/02 11:20:00 AM
Received : 11/21/02 9:00:00 AM
Collected By : Client
Copies To : John Eisenhart

Point No :
Location :

Client ID. : WELL #2

Parameter(s)	Results	Units	Limit	Method Number	Analyzed
Benzo(a)pyrene	< 0.10	µg/L	0.2	E525.2	12/16/02 6:25:00 PM

Result(s) reported meet(s) Regulatory Limit(s).
Result(s) flagged with * Exceed Regulatory Limit(s). Limit noted.

Date Reported : 12/17/02

Joann M. Slavin
Laboratory Manager

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SMITH LABORATORY

ENVIRONMENTAL TESTING
4 SCENIC DRIVE & RT. 9
HYDE PARK, NEW YORK 12538
(845) 229-6536

CERTIFICATE OF ANALYSIS

Client: Poughkeepsie Townwide Water District
Bob Kurdi
1 Overocker Rd.
Poughkeepsie NY 12603

PO #

Sample Type: Water
Client Project Name: Frank Brothers Wells
Sample Location: Well #3
Order comment:
Order ID: 16788
Sample Number: 30481

Sample Collected By: D. Hammond for Smith
Date/Time sample collected: 11/20/02 11:40
Date/Time sample received: 11/20/02 13:10
Received by: Kelly
Sample Comment:

Parameter:	Test Result	Units*	Test Method	MDL	Test Date/Time		Tech
Antimony	< 0.003	mg/L	EPA 200.9	0.003	12/6/02		LAE
Arsenic	< 0.005	mg/L	EPA 200.9	0.005	12/3/02		LAE
Barium	0.038	mg/L	SM18 3111-D	0.001	11/26/02		LAE
Beryllium	< 0.001	mg/L	EPA 200.7		11/26/02		LAE
Cadmium	< 0.002	mg/L	EPA 200.7		11/26/02		LAE
Calcium	81.5	mg/L	EPA 200.7		11/26/02		LAE
chloride	110	mg/L	SM18 4500 Cl-B	5	11/21/02		DR
Chromium	< 0.002	mg/L	EPA 200.7		11/26/02		LAE
Color	< 5,pH=7.6	PtCo	SM18 2120-B	5	11/20/02	16:30	DR
Cyanide, Free	< 0.01	mg/L	SM18 4500 CN E	0.01	12/3/02		DR
Fluoride	< 0.2	mg/L	SM18 4500 F-C		11/21/02		DR
Hardness, as CaCO3	285	mg/L	EPA 200.7		11/26/02		LAE
iron	0.005	mg/L	EPA 200.7	0.004	11/26/02		LAE
Magnesium	19.8	mg/L	EPA 200.7		11/26/02		LAE
Manganese	0.003	mg/L	EPA 200.7		11/26/02		LAE
Mercury	< 0.0004	mg/L	EPA 245.1		12/5/02		LAE
Nickel	< 0.004	mg/L	EPA 200.7		11/26/02		LAE
Nitrate-N	0.93	mg/L	SM18 4500 NO3-D	0.2	11/22/02		DR
Nitrite-Nitrogen	< 0.01	mg/L	SM18 4500 NO2-B	0.01	11/21/02	17:00	DR
Odor	ND @44.5C	T.O.N.	EPA 140.1	1	11/21/02	14:00	DR

SMITH LABORATORY

ENVIRONMENTAL TESTING
4 SCENIC DRIVE & RT. 9
HYDE PARK, NEW YORK 12538
(845) 229-6536

CERTIFICATE OF ANALYSIS

Client: Poughkeepsie Townwide Water District
Bob Kurdi
1 Overocker Rd.
Poughkeepsie NY 12603 **PO #**

Sample Type: Water
Client Project Name: Frank Brothers Wells
Sample Location: Well #3
Order comment:
Order ID: 16788
Sample Number: 30481

Selenium	< 0.002	mg/L	EPA 200.9	0.002	12/5/02	LAE
Silver	< 0.002	mg/L	EPA 200.7		11/25/02	LAE
Sodium	69.8	mg/L	EPA 200.7		11/25/02	LAE
Sulfate	36	mg/L	EPA 375.4	2	11/25/02	DR
Thallium	< 0.001	mg/L	EPA 200.9	0.001	11/26/02	LAE
Zinc	< 0.004	mg/L	EPA 200.7		11/26/02	LAE

Results Comment:

Reviewed by: Anne G. Smith, Laboratory Director, ELAP Lab ID #10924 13-Jan-03

*Key: mg/L = milligrams per liter ug/L = micrograms per liter mg/kg = milligrams per kilogram dry weight mL/L=Milliliters per Liter < = less than J = result estimated below quantitation limit NTU = Nephelometric Turbidity Units PtCo = Platinum Colbalt Units SU = Standard pH Units TON = Threshold Odor Number MCL=New York State Maximum Contaminant Level MDL = Method Detection Limit umho/cm=micromhos per centimeter ND=Not Detected **Analysis performed by sub-contract laboratory; ELAP Lab ID listed under "Tech" Est=Estimated Value

SMITH LABORATORY
ENVIRONMENTAL TESTING
4 SCENIC DRIVE & RT. 9
HYDE PARK, NEW YORK 12538
(845) 229-6536

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WATER ANALYSIS REPORT

Client: Poughkeepsie Townwide Water District
Bob Kurdi
1 Overocker Road
Poughkeepsie, NY 12603

Sample Identification: Frank Brothers Wells, Overlook Rd., Poughkeepsie, NY
Sample Type: drinking water supply
Sampling Point: Well 3
Sample Lab No: 30481
Sample Collected By: D. Hammond for Smith Lab
Date Sampled: 11-20-02
Date Received: 11-20-02
Date POCs Analyzed: 11-27-02 Test method: EPA 502.2

Analyte	Principal Organic Contaminant Test Result*	MCL**
Benzene	< 0.5 ug/L	5 ug/L
Bromobenzene	< 0.5 ug/L	5 ug/L
Bromochloromethane	< 0.5 ug/L	5 ug/L
Bromomethane	< 0.5 ug/L	5 ug/L
n-Butylbenzene	< 0.5 ug/L	5 ug/L
sec-Butylbenzene	< 0.5 ug/L	5 ug/L
tert-Butylbenzene	< 0.5 ug/L	5 ug/L
Carbon Tetrachloride	< 0.5 ug/L	5 ug/L
Chlorobenzene	< 0.5 ug/L	5 ug/L
Chloroethane	< 0.5 ug/L	5 ug/L
Chloromethane	< 0.5 ug/L	5 ug/L
2-Chlorotoluene	< 0.5 ug/L	5 ug/L
4-Chlorotoluene	< 0.5 ug/L	5 ug/L
Dibromomethane	< 0.5 ug/L	5 ug/L
1,2-Dichlorobenzene	< 0.5 ug/L	5 ug/L
1,3-Dichlorobenzene	< 0.5 ug/L	5 ug/L
1,4-Dichlorobenzene	< 0.5 ug/L	5 ug/L
Dichlorodifluoromethane	< 0.5 ug/L	5 ug/L
1,1-Dichloroethane	< 0.5 ug/L	5 ug/L
1,2-Dichloroethane	< 0.5 ug/L	5 ug/L
1,1-Dichloroethene	< 0.5 ug/L	5 ug/L
cis-1,2-Dichloroethene	< 0.5 ug/L	5 ug/L
trans-1,2-Dichloroethene	< 0.5 ug/L	5 ug/L
1,2-Dichloropropane	< 0.5 ug/L	5 ug/L
1,3-Dichloropropane	< 0.5 ug/L	5 ug/L
2,2-Dichloropropane	< 0.5 ug/L	5 ug/L
1,1-Dichloropropene	< 0.5 ug/L	5 ug/L
cis-1,3-Dichloropropene	< 0.5 ug/L	5 ug/L
trans-1,3-Dichloropropene	< 0.5 ug/L	5 ug/L
Ethylbenzene	< 0.5 ug/L	5 ug/L
Hexachlorobutadiene	< 0.5 ug/L	5 ug/L
Isopropylbenzene	< 0.5 ug/L	5 ug/L
p-Isopropyltoluene (p-Cymene)	< 0.5 ug/L	5 ug/L
Methylene Chloride	< 0.5 ug/L	5 ug/L
n-Propylbenzene	< 0.5 ug/L	5 ug/L

2M LABS, INC.
Broad Hollow Road, Melville NY 11747
(631) 694-3040 . FAX: (631) 420-8436 NYSDOH ID # 10478

LABORATORY RESULTS

SMITH LABORATORY
50 SCENIC DR. & RT. 9
HYDE PARK, NY 12538
Attn To : JOHN EISENHART

Lab No. : 0211579-003A

Sample Information...
Type : Potable Water
Origin : Dist.
Routine

Federal ID 1302812
Collected : 11/20/02 11:40:00 AM
Received : 11/21/02 9:00:00 AM
Collected By : Client
Copies To : John Eisenhart

Point No :
Location :

Client ID. : WELL #3

Parameter(s)	Results	Units	Limit	Method Number	Analyzed
Benzo(a)pyrene	< 0.10	µg/L	0.2	E525.2	12/16/02 6:59:00 PM

Result(s) reported meet(s) Regulatory Limit(s).
Result(s) flagged with * Exceed Regulatory Limit(s). Limit noted.

Date Reported : 12/17/02

Joann M. Slavin
Laboratory Manager

APPENDIX B-2

Service Station Spill Site #1 and Spill Site #2

FILE COPY

Northville NFA

File# 91-0-7867 9008720

Dutchess (Big 'S')

5.0 POUGHKEEPSIE

5.1 Background Information

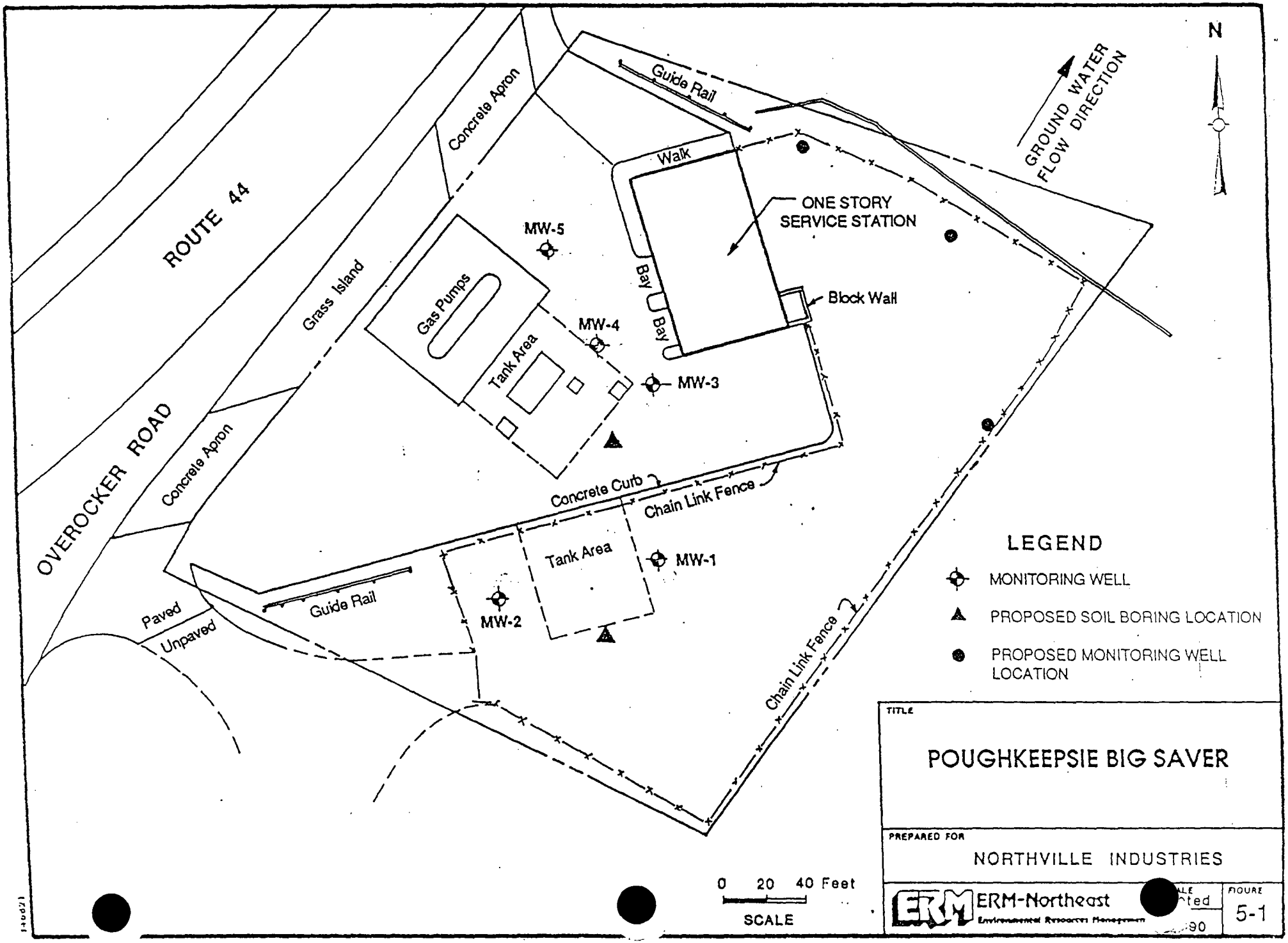
The Big Saver gasoline station is located on the south side of NYS Route 44 between Overrocker Road and Dutchess County Route 46 in the town of Poughkeepsie, Dutchess County, New York. The Poughkeepsie station operates two pump islands from a single story building consisting of an office area, restrooms and two abandoned service bays. A site plan of the station is illustrated in Figure 5-1.

There are reportedly five underground tanks operating at the station. The tank field is comprised of (2) 8,000 gallon steel gasoline tanks, (1) 4,000 gallon steel gasoline tank, (1) 4,000 gallon steel diesel tank, and (1) 2,000 gallon steel kerosene tank. There is also one active 550-gallon fuel oil tank at this location. Tank locations are shown in Figure 5-1.

In addition, there are two (2) 4,000 gallon steel gasoline tanks, and a 550-gallon waste oil tank which have been abandoned. The 4,000 gallon tanks were reportedly 13 years old, and their time of abandonment is not known. The age of the waste oil tank or the time of its abandonment is not known. The waste oil tank was presumably abandoned when the service bays were taken out-of-service.

5.2 Site Investigation

A total of five monitoring wells were installed and sampled at the Poughkeepsie station. Monitoring well locations are illustrated in Figure 5-1. Prior to the well installation, soil samples were obtained, with split-barrel samplers at five-foot intervals, for qualitative screening and lithologic description. Each soil sample was qualitatively screened with an Organic Vapor Analyzer (OVA). Soil samples which displayed


N
GROUND WATER FLOW DIRECTION
ROUTE 44
OVEROCKER ROAD
Grass Island
Concrete Apron
Concrete Apron
Guide Rail
Walk
ONE STORY SERVICE STATION
Block Wall
Bay
Bay
MW-5
MW-4
MW-3
MW-1
MW-2
Gas Pumps
Tank Area
Tank Area
Concrete Curb
Chain Link Fence
Chain Link Fence
Guide Rail
Paved
Unpaved
LEGEND
MONITORING WELL
PROPOSED SOIL BORING LOCATION
PROPOSED MONITORING WELL LOCATION
0 20 40 Feet
SCALE
TITLE
POUGHKEEPSIE BIG SAVER
PREPARED FOR
NORTHVILLE INDUSTRIES
ERM-Northeast
Environmental Resources Management
FIGURE
5-1

comparatively higher readings on the OVA were sent to the laboratory for BTEX, TPH and methyl tert butyl ether (MTBE) analyses.

Results of the qualitative screening of the soil samples with the OVA unit indicated comparatively higher readings in the shallow soils just above the water table. Results of the soils analyses indicated no significant BTEX contamination in the vicinity of the pump islands and storage tanks. However, soil samples obtained from borings B-3 and B-4, located downgradient of the tank area, had total petroleum hydrocarbon (TPH) concentrations of 57 mg/kg and 570 mg/kg, respectively. Analytical results are summarized in Table 5-1.

Based on visual inspection of the soil samples, the lithologic profile beneath the station consists of 10 feet of sands and silts, and 6 feet of gravel and sands which are underlain by a shale bedrock at approximately 16 feet below grade. It appears that the sand and gravel unit is in hydraulic communication with the underlying bedrock. Results of the qualitative screening of the soil samples with the OVA unit indicated comparatively higher readings in the shallow soils just above the water table.

Depth to ground water at the station is approximately seven feet below grade. Measuring point elevations were established for each well relative to a common arbitrary datum. This data is provided in Table 5-2. Based on a topographic map and the results of the elevation survey, the ground water flow direction in the shallow overburden deposits is to the northeast.

After checking for the presence of free product, ground water samples were obtained from the monitoring wells. Analytical results of the ground water samples showed BTEX contamination in monitoring wells MW-3 and MW-4, both of which are situated directly downgradient of the tank area. Total BTEX concentrations were 6,350 ppb for MW-3 and 5,200 ppb for MW-4. MTBE was also detected in MW-3 at 1,800

TABLE 5-1
SUMMARY OF ANALYTICAL DATA
BIG SAVER
POUGHKEEPSIE, NY

Parameter	Soil					Ground Water					
	B-1 (5-7')	B-2 (5-7')	B-3 (5-7')	B-4 (5-7')	B-5 (5-7')	MW1	MW2	MW3	MW4	MW5	TAP
Benzene ug/kg	U	U	U	U	U	U	U	650	1,100	U	U
Toluene ug/kg	U	U	U	U	U	U	U	1,300	3,100	2.9	U
Ethylbenzene ug/kg	U	U	U	U	U	U	U	800	990	2.6	U
Xylenes total ug/kg	U	U	U	U	U	U	U	3,600	4,600	10	U
MTBE ug/kg	U	U	5.4	U	U	13	U	1,800	<250	U	U
TPH mg/kg	<27	<27	57	<27	570						
% Sol %	91	87	92	88	92						

ug/kg = ppb
mg/kg = ppm
TAP = 6" drinking water well
Note: See raw data for detection limits on non-detect results

TABLE 5-2
WATER LEVEL MEASUREMENTS[1]
AND ELEVATION SURVEY
BIG SAVER STATION
POUGHKEEPSIE, NEW YORK
NOVEMBER 1989

Monitoring Well	Date	Depth to Ground Water	Depth to Product	Measuring Point Elevation[2]	Water Elevation[2]
MW-1	11/28/89	7.19	_____	100.30	93.11
MW-2	11/28/89	7.46	_____	101.06	93.60
MW-3	11/28/89	7.49	_____	100.44	92.95
MW-4	11/28/89	7.06	_____	100.00	92.94
MW-5	11/28/89	6.64	_____	99.61	92.97

NOTES: 1 = All measurements expressed in feet
2 = Elevations relative to an arbitrary datum

ppb. No contaminant constituents were detected in the tap water sample from the six-inch bedrock well at the station.

5.3 Proposed Remedial Methods

Both soil and ground water contamination have been identified at this site. In the future, additional soil samples will be taken closer to the tank field to identify and delineate any further soil contamination. Three outpost monitoring wells will be installed downgradient of the tank fields (figure 5-1) to monitor possible contaminant movement.

Soil borings completed on this site indicated limited contamination confined to a small area around the tank field. The groundwater contamination also is limited to this same general vicinity. Therefore, ERM would like to initiate a two (2) year ground water monitoring program. After two years, data collected during this program will be evaluated and a future plan can be derived.

The groundwater monitoring plan to be initiated at this site will include:

- monthly water level measurements;
- each well will be checked for the presence of free product during monthly visits;
- quarterly ground water samples for BTEX and MTBE from all site wells.

All data from these tasks will be entered into a common database and any significant findings will be immediately reported to the proper agencies.

5.4 Schedule of Future Work

Future work at this site will proceed as follows:

1. FURTHER INVESTIGATION

   - Three outpost monitoring wells will be installed downgradient of the tank field. Additional soil borings will be done to delineate the extent of contamination around the tank field. A worst case soil sample will be taken for laboratory analysis from each boring. This task will be completed within the first week of any further investigation.

2. OPERATIONS AND MAINTENANCE

   - Operations and maintenance will include monthly and quarterly monitoring as described in Section 5.3.

ERM-Northeast

175 Froehlich Farm Blvd.
Woodbury, NY 11797
(516) 921-4300
(516) 921-5679 (Fax)

17 April 1995

Mr. Dave Traver
NYSDEC, Region III
21 South Putt Corners Road
New Paltz, New York 12561

Dutchess C

ERM

Re: Underground Storage Tank Removal
Spill Case Nos. 90-08720, 91-07867 and 91-08418
Former Northville Station, Route 44, Poughkeepsie, New York
ERM-Northeast Project No. 215.070

FILE COPY

Dear Mr. Traver:

The following report presents the procedures and results of the recent underground storage tank (UST) removal project conducted at the above referenced station. Field activities were overseen by ERM-Northeast (ERM) and consisted of the following tasks: removal of UST's, removal of impacted soils, and subsequent storage, treatment, and removal of impacted ground water. All tasks conducted during this UST removal were performed in accordance with the NYSDEC STARS Memo #1, Petroleum-Contaminated Soil Guidance Policy and ERM's letter to the NYSDEC dated 22 July 1994, as part of the Stipulation Agreement dated 2 August 1994 regarding the dewatering, treatment, and discharge of ground water to a surface water body.

UNDERGROUND STORAGE TANK (UST) REMOVAL

The UST removal project was conducted on 23, 25 and 26 August 1994 under the supervision of an ERM hydrogeologist. A total of seven UST's (UST's Nos. 1 through 7) were removed by Hudson Valley Pump and Tank of Hudson, New York. The locations of the UST's removed as well as the new and existing tanks are shown in Figure 1.

UST's Nos. 1 through 7 were steel tanks, and only UST's Nos. 1 and 2 had fiberglass coatings and cathodic protection devices. UST's Nos. 3, 4, 5 and 6 had been taken out of service in the past while UST's Nos. 1, 2 and 7 remained in service until just prior to the excavation activities. Only UST No. 4 was previously filled with foam. A copy of the Certificate of Legal Abandonment for Tank No. 4 is provided in Attachment 1.

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A member of the Environmental Resources Management Group

UST's Nos. 1 through 7 were removed and no holes or structural compromises were observed with the exception of UST No. 5. UST No. 5 had a few small holes, less than one centimeter in diameter, along the north end of the tank. UST No. 5 was a 4,000-gallon gasoline tank which had not been in service for some time. Following excavation, all tanks were properly decontaminated and removed from the site.

UST No. 8 was recently tested by the current owner for tightness and passed. UST No. 8 is a steel tank with fiberglass coating and cathodic protection. This UST was left in service for future diesel storage. The newly installed 20,000-gallon doubled-walled steel inner, fiberglass outer UST was placed in gasoline service.

SOIL REMOVAL

A total of 1074 tons (approximately 750 cubic yards) of impacted soils were excavated and ultimately removed from the site under the supervision of ERM. The soil consisted of well rounded and stratified outwash silts, sands and gravel/cobbles. Approximately 9 feet of fill material were present above the native soil. The soil was transported to Posillico Brothers Asphalt facility in Farmingdale, New York where contaminants were thermally destroyed and the soil was completely recycled into road asphalt. Disposal manifests and destruction/recycling certificates are provided as Attachment 1.

An ERM hydrogeologist collected four composite soil samples from each sidewall of the large tank excavation (Figure 2). Volatile organic compound (VOC) analyses were conducted using EPA Methods 8021 and 8270 to characterize the sidewall soils of the tank excavation. Tank excavation bottom samples were not collected due to the presence of the ground water at the base of the tank excavation. A summary of the analytical results is provided in Table 1. Laboratory data sheets are provided as Attachment 2.

Sample NISW, which was located along the eastern sidewall of the excavation for UST's Nos. 3 through 7, was the only sample that contained detectable levels of VOCs. Like the other soil samples, Sample NISW satisfied the protection of human health and protection against objectionable nuisance characteristics criteria of the NYSDEC STARS Memo #1, Petroleum Contaminated Soil Guidance Policy. Unlike the other soil samples, however, detected concentrations of toluene, xylenes, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene/sec-butylbenzene total, and n-

butylbenzene were above the 100 ppb TCLP Alternative Guidance Value of the ground water protection criterion as set forth in Table 1 of the NYSDEC STARS Memo #1. Soil removal was not possible further to the east due to the presence of the service station building foundation.

ERM

GROUND WATER REMOVAL, STORAGE AND TREATMENT

Proper installation of the new 20,000-gallon UST necessitated removal of soils below the water table. Ground water was encountered at 9 feet in the new 20,000-gallon UST tank excavation. The total depth of the tank excavation was 16 feet. After review of historical analytical results from ground water samples collected from monitoring wells MW's 3 and 4, it was decided that treatment was necessary for the ground water extracted during the 20,000-gallon UST installation.

Ground water treatment was conducted in accordance with ERM's letter dated 22 July 1994 of the Stipulation Agreement. On 24 through 26 August 1994, ground water was removed from the open tank excavation and stored in two holding tanks on site. ERM was granted a highway permit by the New York State Department of Transportation (NYSDOT) to discharge the treated water to a catch basin which is located on site and is connected to the storm drain system along Route 44. On 26 through 27 October 1994, the ground water was pumped through an 1,800-pound liquid-phase carbon absorber unit which was set up on site. Afterwards, the treated ground water was discharged to the storm drain. An ERM hydrogeologist collected water quality samples according to the following schedule: at the beginning of treatment, 4 hours after the start of treatment, and at the end of each day. In addition, one influent sample was collected on 27 October.

The water samples were analyzed for BTEX, MTBE, naphthalene and pH. A summary of the analytical results is provided in Table 2. Laboratory data summary sheets are provided in Attachment 3. All post-treatment samples collected during the dewatering program were below the New York State Surface Water Standards. A total of 22,101 gallons of ground water was ultimately pumped, treated and discharged to the catch basin on site.

HISTORICAL GROUND WATER QUALITY

Historically, a total of eight monitoring wells (MW's 1 through 8) have been installed on site. Unfortunately, monitoring well MW-8 was destroyed

during the tank excavation activities, MW-2 could not be found and is presumed to have been paved over, and MW-1 was temporarily damaged and could not be sampled. Historically, BTEX concentrations have been either not detected or detected in trace concentrations in MW's 2 and 8. During the most recent ground water sampling event, which was conducted on 22 November 1994, monitoring wells MW's 3 through 7 were sampled for BTEX.

The results of the most recent ground water sampling event are summarized in Table 3, and the original laboratory data sheets are provided as Attachment 3. In addition, for the purposes of comparison and contrast, the historical ground water quality data (BTEX analyses) since November 1989, which is when MW's 1 through 5 were installed, are included in the table.

While BTEX was detected in November 1994 in MW's 3 and 4, the ground water quality data for MW's 3 and 4 over the course of the past three years demonstrate a general decreasing trend in the concentrations of BTEX. Consequently, it appears that removal of the source material (i.e. UST's and impacted soils) has resulted in an overall improvement in the ground water quality beneath the site.

Consistent with historical data, ground water samples collected from MW's 5, 6 & 7 had no detected levels of BTEX. Data collected from MW's 6 & 7 show that at worst (3 years ago) only nominal BTEX contamination reached the downgradient property line of the site and that non detect or near non detect total BTEX have been observed during the past 18 months.

POTENTIAL OFF-SITE IMPACTS AND RECEPTORS

Potable water for the local area is supplied by the Town of Poughkeepsie which buys potable water from the City of Poughkeepsie Water Plant. The City of Poughkeepsie reportedly obtains approximately 99% of its potable water from the Hudson River. The remainder is obtained from municipal supply wells. Three municipal supply wells, which are owned by the Town of Poughkeepsie, are situated nearly 2,000 feet to the southeast (cross-gradient) of the site on (old) Overlook Road just west of Wappinger Creek. According to Mr. Richard Volk, Public Health Engineer, Duchess County Health Department and Mr. Fred Androse, Town of Poughkeepsie Water Department, the wells are about 15 years old, and they are put into service

TABLE 1

FORMER NORTHVILLE INDUSTRIES - SERVICE STATION
ROUTE 44, POUGHKEEPSIE, NEW YORK
ANALYTICAL RESULTS - TANK PIT SAMPLES

Volatile Organic Compounds by EPA Method 8021	TCLP Alternative Guidance Value*	NITK1/2	NINEWEW	NIWW	NISW
Benzene	14	<10	<10	<10	<10
Ethylbenzene	100	<20	<20	<20	45
Toluene	100	<20	<20	<20	480
m-Xylene	100	<20	<20	<20	620
p-Xylene	100	<20	<20	<20	300
o-Xylene	100	<20	<20	<20	100
Isopropyl Benzene	100	<20	<20	<20	<20
n-Propylbenzene	100	<20	<20	<20	30
p-Cymene	NA	<20	<20	<20	<20
1,2,4-Trimethylbenzene	100	<20	<20	<20	880
1,3,5-Trimethylbenzene & sec-Butylbenzene Total	100	<20	<20	<20	470
n-Butylbenzene	100	<20	<20	<20	130
Napthalene	200	<100	<100	<100	110
Methyl-t-Butyl Ether	NA	<40	<40	<40	<40

Semi-Volatile Organic Compounds by EPA Method 8270					
Acenaphthene	400	<160	<160	<160	<160
Anthracene	1000	<160	<160	<160	<160
Benzo(a)anthracene	0.04	<160	<160	<160	<160
Benzo(a)pyrene	0.04	<160	<160	<160	<160
Benzo(b)fluoranthene	0.04	<160	<160	<160	<160
Benzo(k)fluroanthene	0.04	<160	<160	<160	<160
Chrysene	0.04	<160	<160	<160	<160
Dibenzo(a,h)anthracene	1000	<160	<160	<160	<160
Fluoranthene	1000	<160	<160	<160	<160
Fluorene	1000	<160	<160	<160	<160
Phenanthrene	1000	<160	<160	<160	<160
Pyrene	1000	<160	<160	<160	<160
Benzo(g,h,i)perylene	0.04	<160	<160	<160	<160
Indeno(1,2,3-cd)pyrene	0.04	<160	<160	<160	<160
Napthalene	200	<160	<160	<160	<160

Notes:

* = NYSDEC STARS Memo #1, Petroleum-Contaminated Soil Guidance Policy, Guidance Values for Gasoline and Fuel Oil Contaminated Soil as per TCLP Alternative Guidance Values, August 1992.

Concentrations are measured in ug/kg(parts per billion(ppb)).

NA = Not Available.

NIPOU.XLS 9/19/94

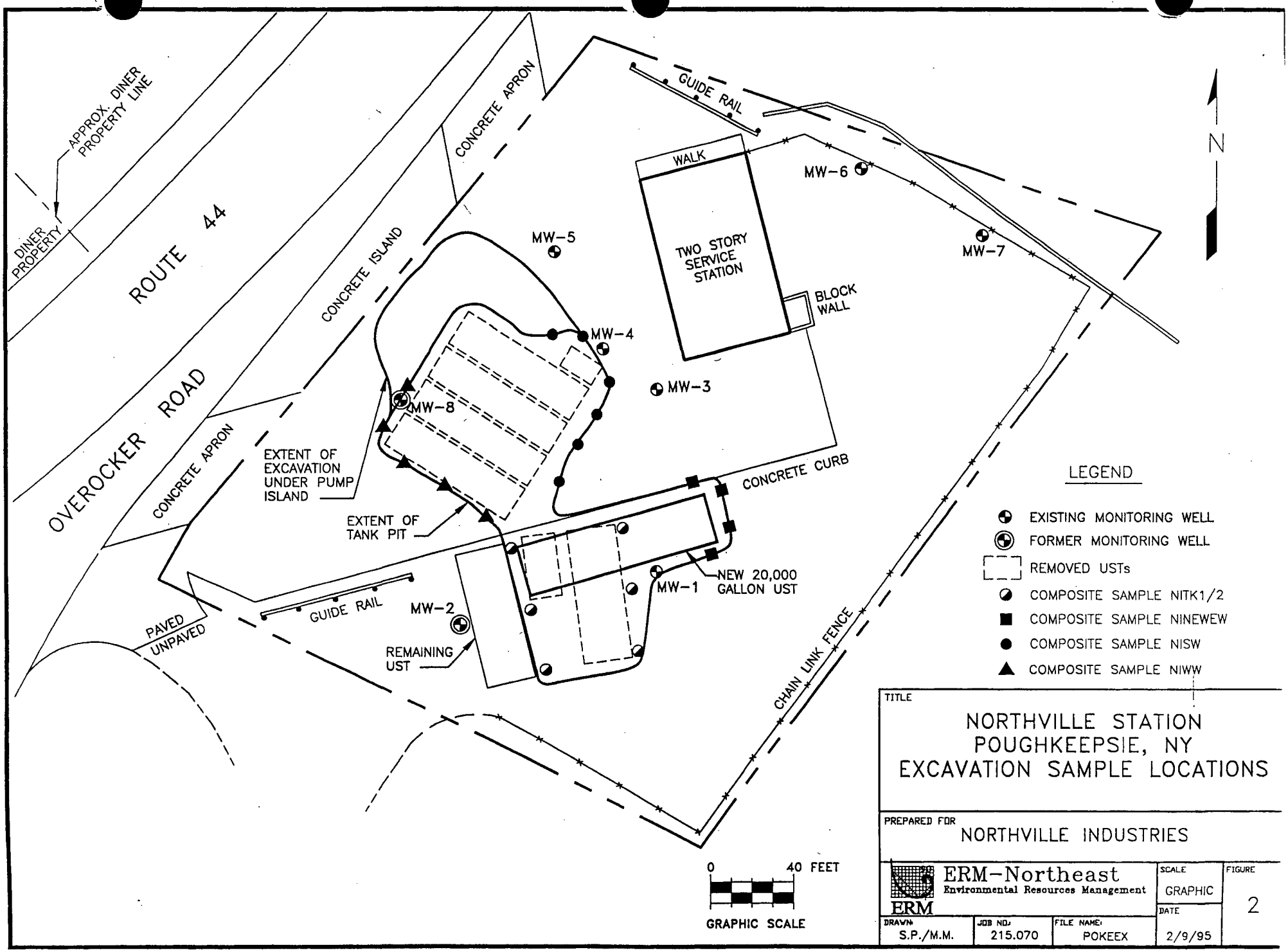
TABLE 2

FORMER NORTHVILLE INDUSTRIES - SERVICE STATION
ROUTE 44, POUGHKEEPSIE, NEW YORK
ANALYTICAL RESULTS - TREATED GROUND WATER

Parameter	NYSSWS*	TW-1 10/26/94@9:00A	TW-2 10/26/94@1:15P	TW-3 10/26/94@4:30P	TW-4 10/27/94@10:50A	UTW-1*** 10/27/94@8:15A
Benzene	0.7** (6)	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	5** (NS)	<1	<1	<1	<1	<1
Toluene	5** (NS)	<1	<1	<1	<1	<1
Xylenes (Total)	5** (NS)	<1	<1	1	1	1
Naphthalene	10 (NS)	<5	<5	<5	<5	18
Methyl-t-Butyl Ether	NS	<2	<@	<2	<2	120
pH	6.5-8.5 (6-9.5)	8.60	8.56	8.47	8.57	NA

NOTES:

* = New York State Surface Water Standards, 9/9/91
** = Guidance Value Only (Calculated Number)
*** = **UTW-1 was collected prior to treatment system.**
Concentrations are measured in ug/1 (parts per billion (ppb)).
NA = Not Analyzed
NS = No Standard


APPROX. DINER PROPERTY LINE
DINER PROPERTY
ROUTE 44
OVEROCKER ROAD
CONCRETE APRON
CONCRETE ISLAND
CONCRETE APRON
GUIDE RAIL
WALK
MW-6
MW-7
MW-5
TWO STORY SERVICE STATION
BLOCK WALL
MW-4
MW-3
MW-8
EXTENT OF EXCAVATION UNDER PUMP ISLAND
EXTENT OF TANK PIT
CONCRETE CURB
NEW 20,000 GALLON UST
MW-1
GUIDE RAIL
MW-2
REMAINING UST
PAVED
UNPAVED
CHAIN LINK FENCE
N
LEGEND
EXISTING MONITORING WELL
FORMER MONITORING WELL
REMOVED USTs
COMPOSITE SAMPLE NITK1/2
COMPOSITE SAMPLE NINEWEW
COMPOSITE SAMPLE NISW
COMPOSITE SAMPLE NIWW
0
40 FEET
GRAPHIC SCALE
TITLE
NORTHVILLE STATION
POUGHKEEPSIE, NY
EXCAVATION SAMPLE LOCATIONS
PREPARED FOR
NORTHVILLE INDUSTRIES
ERM-Northeast
Environmental Resources Management
ERM
SCALE
GRAPHIC
FIGURE
2
DATE
2/9/95
DRAWN
S.P./M.M.
JOB NO.
215.070
FILE NAME:
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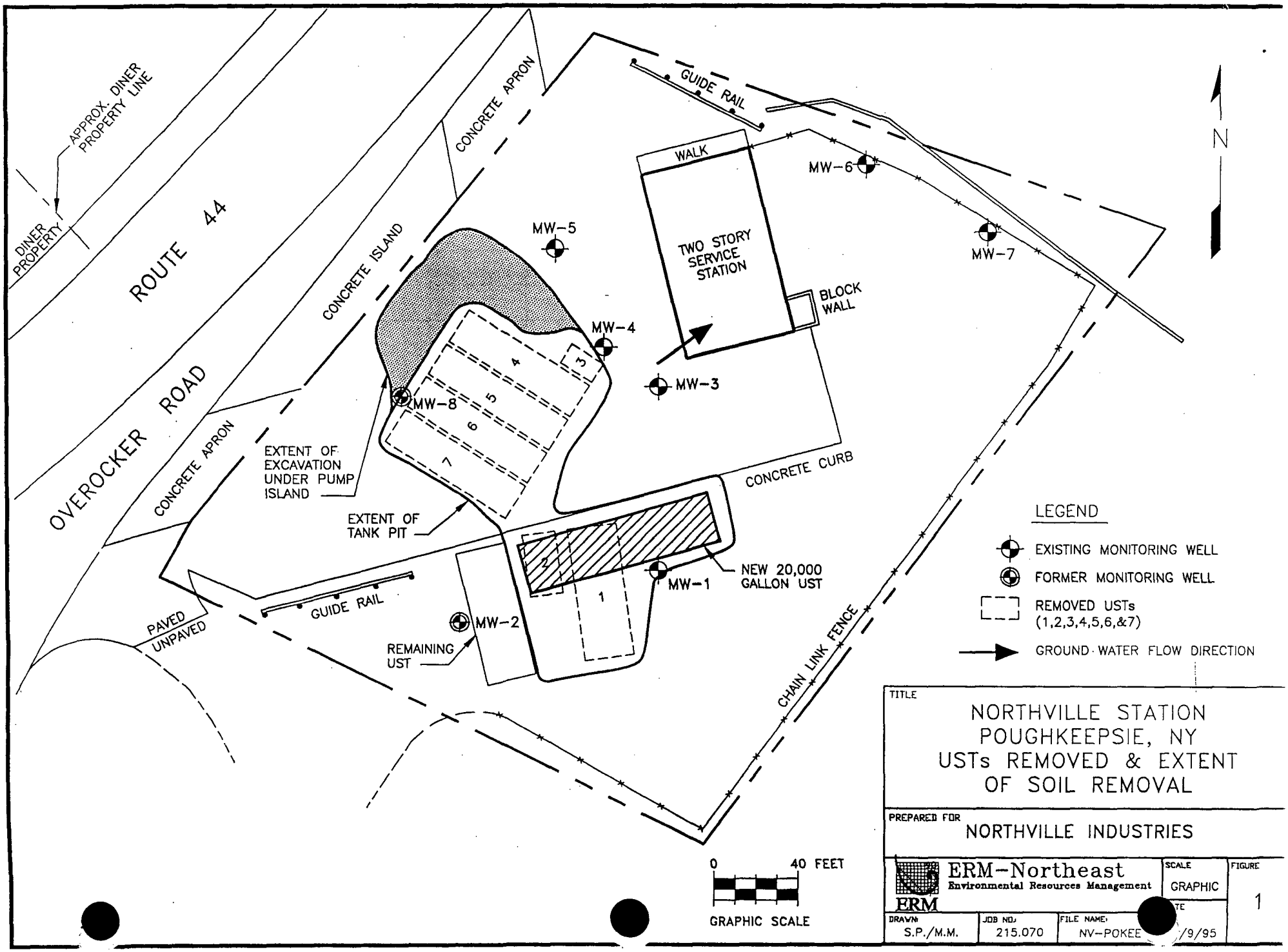
APPROX. DINER PROPERTY LINE
DINER PROPERTY
ROUTE 44
OVEROCKER ROAD
CONCRETE APRON
CONCRETE ISLAND
CONCRETE APRON
GUIDE RAIL
WALK
TWO STORY SERVICE STATION
BLOCK WALL
MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
MW-7
MW-8
EXTENT OF EXCAVATION UNDER PUMP ISLAND
EXTENT OF TANK PIT
CONCRETE CURB
NEW 20,000 GALLON UST
REMAINING UST
GUIDE RAIL
PAVED
UNPAVED
CHAIN LINK FENCE
1
2
3
4
5
6
7
N
LEGEND
EXISTING MONITORING WELL
FORMER MONITORING WELL
REMOVED USTs (1,2,3,4,5,6,&7)
GROUND WATER FLOW DIRECTION
0
40 FEET
GRAPHIC SCALE
TITLE
NORTHVILLE STATION
POUGHKEEPSIE, NY
USTs REMOVED & EXTENT
OF SOIL REMOVAL
PREPARED FOR
NORTHVILLE INDUSTRIES
ERM-Northeast
Environmental Resources Management
ERM
SCALE
GRAPHIC
FIGURE
1
DRAWN
S.P./M.M.
JOB NO.
215.070
FILE NAME:
NV-POKEE
/9/95

TABLE 3

MONITORING WELL DATA - NORTHVILLE INDUSTRIES

POUGHKEEPSIE NYSDEC SPILL # STATION #	NYSDEC REQUIRED MONITORING NONE

GENERAL WELL INFO	WATER QUALITY		GAUGING DATA				
	DATE SAMPLED	TOTAL BTEX (ppb)	DATE	DTP (FT)	DTW (FT)	PTH (FT)	ELEV. (FT)
MW-1	11/28/89	ND	11/28/89	-	7.19	-	93.11
Installed 11/28/89	3/3/92	12.5	1/29/91	-	6.88	-	93.42
M P E = 100.30	1/8/93	ND	11/5/91	-	7.58	-	92.72
	4/8/93	4.0	3/3/92	-	6.98	-	93.32
	10/5/93	1.0	1/8/93	-	6.92	-	93.38
	11/22/94	NS	4/8/93	-	5.94	-	94.36
			10/5/93	-	8.33	-	91.97
			12/23/93	-	6.34	-	93.96
			6/24/94	unable to locate			
MW-2	11/28/89	ND	11/28/89	-	7.46	-	93.60
Installed 11/28/89	3/3/92	ND	1/29/91	-	7.33	-	93.73
MPE= 101.06	10/5/93	NS	11/5/91	-	8.00	-	93.06
	11/22/94	NS	3/3/92	-	7.37	-	93.69
			1/8/93	inaccessible			
			4/8/93	inaccessible			
			10/5/93	inaccessible			
			12/23/93	inaccessible			
			6/24/94	inaccessible			
MW-3	11/28/89	6,350	11/28/89	-	7.49	-	92.95
Installed 11/28/89	3/3/92	438	1/29/91	-	7.38	-	93.06
M P E = 100.44	1/8/93	617	11/5/91	-	7.73	-	92.71
	4/8/93	2,810	3/3/92	-	7.39	-	93.05
	10/5/93	261	1/8/93	-	7.35	-	93.09
	11/22/94	53	4/8/93	-	6.67	-	93.77
			10/5/93	-	8.36	-	92.08
			12/23/93	-	7.01	-	93.43
			6/24/94	-	7.63	-	92.81
MW-4	11/28/89	9,790	11/28/89	-	7.06	-	92.94
Installed 11/28/89	3/3/92	5,580	1/29/91	-	6.97	-	93.03
M P E = 100.00	1/8/93	8,350	11/5/91	-	7.32	-	92.68
	4/8/93	7,320	3/3/92	-	6.97	-	93.03
	10/5/93	27	1/8/93	-	6.95	-	93.05
	11/22/94	1,000	4/8/93	-	6.30	-	93.70
			10/5/93	-	7.98	-	92.02
			12/23/93	-	6.60	-	93.40
			6/24/94	-	7.16	-	92.84

NOTES:

DTW=Depth To Water
DTP=Depth To Product
PTH=Product Thickness
ND=Not Detected

MPE=Measuring Point Elevation (ft)
ELEV=Water Table Elevation; is equal to MPE-(DTW-0.8*PTH)
NS=Not Sampled

MONITORING WELL DATA
NORTHVILE INDUSTRIES

POUGHKEEPSIE - PAGE 2

GENERAL WELL INFO	WATER QUALITY		GAUGING DATA				
	DATE SAMPLED	TOTAL BTEX (ppb)	DATE	DTP (FT)	DTW (FT)	PTH (FT)	ELEV. (FT)
MW-5	11/28/89	15.5	11/28/89	-	6.64	-	92.97
Installed 11/28/89	3/3/92	3.5	1/29/91	-	6.54	-	93.07
M P E = 99.61	1/8/93	ND	11/5/91	-	6.88	-	92.73
	4/8/93	20.0	3/3/92	-	6.57	-	93.04
	10/5/93	ND	1/8/93	-	6.53	-	93.08
	11/22/94	ND	4/8/93	-	6.02	-	93.59
			10/5/93	-	7.48	-	92.13
			12/23/93	-	6.24	-	93.37
			6/24/94	-	6.68	-	92.93
MW-6	3/3/92	114.3	3/3/92	-	7.42	-	92.39
Installed 3/3/92	1/8/93	41.0	1/8/93	-	7.05	-	92.76
M P E = 99.81	4/8/93	7.0	4/8/93	-	6.55	-	93.26
	10/5/93	5.0	10/5/93	-	8.57	-	91.24
	11/22/94	ND	12/23/93	-	6.82	-	92.99
			6/24/94	inaccessible			
MW-7	3/3/92	ND	3/3/92	-	7.99	-	90.98
Installed 3/3/92	1/8/93	ND	1/8/93	-	8.04	-	90.93
M P E = 98.97	4/8/93	50.0	4/8/93	-	6.39	-	92.58
	10/5/93	ND	10/5/93	-	8.93	-	90.04
	11/22/94	ND	12/23/93	-	7.40	-	91.57
			6/24/94	inaccessible			
MW-8	3/3/92	ND	3/3/92	-	7.27	-	93.28
Installed 3/3/92	1/8/93	ND	1/8/93	-	7.25	-	93.30
M P E = 100.55	10/5/93	2.0	4/8/93	6.58	6.60	0.02	93.97
	11/22/94	NS	10/5/93	-	8.33	-	92.22
			12/23/93	-	6.92	-	93.63
			6/24/94	-	7.48	-	93.07

NOTES:

DTW=Depth To Water
DTP=Depth To Product
PTH=Product Thickness
ND=Not Detected

MPE=Measuring Point Elevation (ft)
ELEV=Water Table Elevation; is equal to MPE-(DTW-0.8*PTH)

intermittently only for emergency purposes. There are no known potential ground water receptors situated downgradient of the site.

Based on the water table elevations observed in the monitoring wells and consistent with local topography, ground water flow is to the northeast. The nearest downgradient surface waterbody is an unnamed brook located nearly 1,800 feet to the northeast of the site. The unnamed brook flows south for approximately 1,400 feet and discharges into Wappinger Creek. Wappinger Creek flows for 10 miles ultimately discharging into the Hudson River in the vicinity of New Hamburg. Neither the unnamed brook nor Wappinger Creek is fit for human consumption or for food processing.

Even if ground water contamination migrated off the site, there are no downgradient receptors likely to be impacted.

SUMMARY AND CONCLUSIONS

On 23, 25 and 26 August 1994, ERM supervised the removal of seven UST's. A total of 1074 tons (approximately 750 cubic yards) of impacted soils was removed from the tank excavations. Subsequently, soil was transported to Posillico Brothers Asphalt in Farmingdale, New York where it was recycled into road asphalt.

Analytical results from composite sidewall samples NIWW, NITK 1/2 and NINEWEW confirmed that most of the sidewall of the excavation was not impacted. Volatile organic results for composite sample NISW suggest that a small volume of impacted soils remain in one area. However, further removal of soils in the vicinity of sample NISW was not possible due to the close proximity of the service station's building foundation.

After receipt of NYSDEC and NYSDOT approval 22,101 gallons of temporarily stored contaminated ground water, which was dewatered during the new installation of the new 20,000-gallon tank, were treated utilizing a liquid-phase carbon absorber unit. The treated water was discharged to the on-site catch basin which is connected to the storm drain system along Route 44.

Recent and historical analytical results of ground water sampling indicate a significant improvement in ground water quality beneath the site. Since source removal activities at the site have been essentially completed (as

limited by considerations of practicality), ground water quality is expected to further improve over time.

ERM

The tasks defined in the work plan of Schedule "A" of the 2 August 1994 Stipulation Agreement have been completed in conformance with Schedules "B" and "C". Accordingly, we herein request on behalf of Northville that the subject Spill Cases Nos.: 90-08720, 91-07867 and 91-08413 be closed in consideration of the following: NFA ACTIVE NFA 9/95 VMC 1·2·96

- Source removal activities (i.e., UST's and impacted soils) essentially have been completed at the subject property;

- The three subject Spill Cases are all related to the reported release from the station's former diesel tank and, therefore, all remedial activities and ground water monitoring have addressed all three cases;

- Both the soil and ground water impacts were localized to the area immediately adjacent to the former tank field as demonstrated by the results of post-excavation sidewall soil samples and historical ground water monitoring data;

- Ground water quality in the monitoring wells located immediately downgradient of the former tank field has significantly improved thereby indicating that the source material has effectively been removed and is no longer impacting ground water quality;

- Based on the station's historical ground water data base, which documents improvement of water quality at the downgradient wells on site, there are no off-site impacts to ground water; and

- Based on discussions with the Duchess County Health Department and the Town of Poughkeepsie Water Department and given the distance to the nearest downgradient surface water body, there are no known potential ground water receptors situated downgradient of the site.

Should you have any questions or if you wish to further discuss the above or enclosed information, please do not hesitate to contact me.

ERM

Very truly yours,

Al Jaroszewski
Project Manager

Attachments
cc: Tom Maus, Northville Industries Corp.
Mitch Nesheit, Gas Land Petroleum

Environmental
Resources
Management

175 Froehlich Farm Blvd.
Woodbury, NY 11797
(516) 921-4300
(516) 921-5637 (Fax)

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NYS DEC
REGION 3 NEW PALTZ

16 April 1999

Mr. David Traver
New York State Department of
Environmental Conservation
21 South Putt Corners Road
New Paltz, New York 12651-1696

FILE COPY

Dutchess Co

ERM

Re: Spill Numbers 90-08720, 91-07867, and 91-08413
Former Northville Service Station
Route 44
Poughkeepsie, New York

Dear Mr. Traver:

The enclosed ground water monitoring data is transmitted for your file and consideration. These recently collected data confirm previously submitted data and support the decision to issue a "Site Inactivation" letter if not a "Closed Meets Standards" designation in conformance with the Department's Spill Guidance Manual (SGM), as presented in the NYSDEC memorandum "Petroleum Site Inactivation and Closure" dated 23 February 1998, as follows:

1. ***Site Characterization:*** Site and subsurface investigations were started in September 1989, completed in March 1992, and the results were presented to NYSDEC in the ERM-Northeast (ERM) report dated January 1990 and ERM letters dated 12 December 1991 and 30 June 1992.

   Historical well gauging and dissolved hydrocarbon data are summarized in the attached table. Laboratory analytical results from the most recent sampling event are provided as Attachment A. Graphs of monitoring wells 3 and 4 depicting water level elevation data and Total BTEX data versus time are provided as Figures 1 and 2. The distribution of historical dissolved BTEX and MTBE in ground water is shown on Figure 3. The recent ground water quality data indicate ground water quality has improved to below laboratory detection limits for the BTEX compounds in all site wells except MW-3 and 4, which had concentrations of 4 and 1 ug/l respectively.

PRINTED ON RECYCLED PAPER

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 3
21 South Putt Corners Road, New Paltz, New York 12561-1696
Phone: (914) 256-3113 FAX: (914) 255-2987

John P. Cahill
Commissioner

DATE: August 13, 1999

Mr. Thomas Maus
Northville Industries Corp.
25 Melville Park Rd.
Melville, N.Y. 11747

REF: Spill No. : 910-7867
Location: Former Northville S/S
Rt 44
Poughkeepsie, N.Y.
County : Dutchess

Dear Mr. Thomas Maus:

The file for the site referenced above has been reviewed and a determination has been made, based on the current information available at this time, including receipt of Report dated: July 14, 1999, from Environmental Resources Management, no further work is required for this site in relationship to the above-noted spill number.
Please Note : Spill Number(s) : 910-8413 & 900-8720, relateded to this site, are also closed and no further work is required in relationship to them at this time.

Sincerely,

Vincent P. McCabe

Vincent P. McCabe
Environmental Engineering Tech. III
NYSDEC Region 3

VPM/ th

cc: P. Doshna/P. DeCicco/ D.Traver
M.Mastro/ D.Weitz
W.Wadsworth/ D.Bendell-SIS, PBS
S.C./Dutchess Co. Health Dept.

Mr. E. Rossano/REM
175 Froehlich Farm Blvd., Woodbury, N.Y. 11797
Mr. D. Sommer, Esq./ Ward, Sommer & Moore,L.L.C.
Plaza Office Center, 122 South Swan St., Albany, N.Y.12210

FAXED 8.13.99
(518) 472 1774

91NFNOTH.WPD

2. *Source Removal:* With the exception of the single measurement in April 1993 (0.02 feet in MW-8), no free-phase product has been observed in any of the wells during the entire 9 year monitoring period.

   The best available technology of soil excavation was applied to the extent practical in order to remove grossly contaminated soils. A total of 1,074 tons of impacted soils were excavated, tested, loaded, and transported off site for recycling in August and September 1994 during the removal of seven (7) UTS's as documented in ERM-Northeast's 17 April 1995 letter to NYSDEC.

3. *Remediation:* The best available technology of ground water recovery was employed to the extent practical during the course of installing the new 20,000 gallon UST. Ground water extracted from the excavation (dewatering) was treated by a granular activated carbon filter and discharged on site in accordance with the NYSDEC Stipulation Agreement (effective date, 1 August 1994). A total of 22,101 gallons of ground water was ultimately pumped, treated, and discharged as documented in ERM-Northeast's 17 April 1995 letter to NYSDEC.

   Upon completion of this active remedial measure, the residual contaminant concentrations in the ground water were observed to be greater than background or pre-release conditions. Natural Attenuation was then appropriately applied as the best available technology to remediate the residual contamination because:

   a. source remediation had been completed;

   b. BTEX constituents degrade with relative ease[1];

   c. favorable regional hydrogeologic conditions existed (e.g. coarse lithology which helps to increase dispersion, dilution and volatilization);

[1] EPA Directive Number: 9200.4-17, December 1997, "Use of Monitored Natural Attenuation at Superfund, RCRA, Corrective Action, and Underground Storage Tanks Sites".

d. suitable regional geochemistry existed, including generally high dissolved oxygen levels which maximize aerobic biodegradation, one of the most significant biodegradation processes[2];

e. the residual chemicals of concern were of low concentrations and within limited distance downgradient of the source (see "Historical Ground Water Quality", page 3 of ERM-Northeast letter dated 17 April 1995); and

f. there were no known potential ground water receptors situated on-site or down gradient of the site.

The observed decline in dissolved hydrocarbon concentrations in the ground water reported in ERM-Northeast letters to NYSDEC of 17 April 1995 and 14 February 1996 are evidence of the positive effects of direct removal of the contaminant source and ongoing natural attenuation processes. The enclosed new data confirm the continuation of these trends.

The analyses of the most recent ground water samples collected from the six (6) well monitoring network (MW's 1,3,4,5,6 & 7) show that the ground water underlying the site and to the most down gradient property line satisfy class GA fresh ground water standards for BTEX compounds and MTBE, except for 4 ppb Benzene at MW 4, which satisfies stringent NYS drinking water standards (MCL's).

4. *Exposure Assessment:* Since the ground water satisfies the quality standards for the highest and best use (drinking water supply), which are protective of the most sensitive potential receptors, there are no exposures to assess.

5. *Inactivation:* Based on satisfaction of standards, the site may be given a "Closed Meets Standards" designation.

6. *Documentation:* Previously transmitted data and reports cited above and the contents and enclosures of this letter document the appropriateness of the decision to close or inactivate the subject spill cases.

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[2] Salerno, J.P., 1993, The role of bioattenuation in the management of aromatic hydrocarbon plumes in acquifers. *Groundwater Monitoring and Review* 13, no. 4:150-61.

Summary

Northville has remediated the site to the extent practical in conformance with applicable statutory and regulatory provisions for the protection of human health and the environment. Ground water monitoring data collected during the four (4) years since active remedial measures were completed show that the ground water has been restored through natural attenuation to the satisfaction of quality standards. Northville has completed the procedures and satisfied all the requirements for "Closed Meets Standards" designation, as defined in the NYSDEC memorandum dated 23 February 1998. Accordingly, we respectfully request on Northville's behalf that the subject spill case nos. 90-08720, 91-07867, and 91-08413 be designated "Closed Meets Standards".

Please inform Northville if the department requires additional information or documentation in order to issue a "Closed Meets Standards" designation. If you should have any questions or comments, please call Tom Maus of Northville at (516) 753-4364 or myself at (516) 921-4300.

Very Truly Yours,

Ernest Rossano

Ernest Rossano, C.P.G.
Group Manager

cc: P. Doshna, NYSDEC Region 3 (with enclosure)
T. Maus, Northville Industries Corp. (with enclosure)
M. Nesheiwat, Gas Land Petroleum (with enclosure)

TABLE 1
MONITORING WELL DATA - NORTHVILLE INDUSTRIES

POUGHKEEPSIE NYSDEC SPILL # STATION #	NYSDEC REQUIRED MONITORING

GENERAL WELL INFO	WATER QUALITY			GAUGING DATA				
	DATE SAMPLED	TOTAL BTEX (ppb)	MTBE (ppb)	DATE	DTP (FT)	DTW (FT)	PTH (FT)	ELEV. (FT)
MW-1	11/28/89	ND	-	11/28/89	-	7.19	-	93.11
Installed 11/28/89	3/3/92	12.5	-	1/29/91	-	6.88	-	93.42
M P E = 100.30	1/8/93	ND	-	11/5/91	-	7.58	-	92.72
	4/8/93	4	-	3/3/92	-	6.98	-	93.32
	10/5/93	ND	-	1/8/93	-	6.92	-	93.38
	11/22/94	NS	NS	4/8/93	-	5.94	-	94.36
	6/13/95	1	95	10/5/93	-	8.33	-	91.97
	9/20/95	3	600	12/23/93	-	6.34	-	93.96
	1/17/96	ND	110	6/24/94	UNABLE TO LOCATE			
	5/22/97	ND	10	6/13/95	-	8.66	-	91.64
	12/2/98	ND	17	9/20/95	-	9.65	-	90.65
				1/17/96	-	8.44	-	91.86
				5/22/97	-	7.80	-	92.50
				6/9/98	Under Pile Of Wood Chips			
				12/2/98	-	9.57	-	90.73
MW-2	11/28/89	ND	-	11/28/89	-	7.46	-	93.60
Installed 11/28/89	3/3/92	ND	-	1/29/91	-	7.33	-	93.73
MPE= 101.06	10/5/93	NS	NS	11/5/91	-	8.00	-	93.06
				3/3/92	-	7.37	-	93.69
				1/8/93	inaccessible			
				4/8/93	inaccessible			
				10/5/93	inaccessible			
				12/23/93	inaccessible			
				6/24/94	destroyed			

NOTES:

DTW=Depth To Water
DTP=Depth To Product
PTH=Product Thickness
ND=Not Detected

MPE=Measuring Point Elevation (ft)
ELEV=Water Table Elevation; is equal to MPE-(DTW-0.8*PTH)
NS=Not Sampled

GENERAL WELL INFO	WATER QUALITY			GAUGING DATA				
	DATE SAMPLED	TOTAL BTEX (ppb)	MTBE (ppb)	DATE	DTP (FT)	DTW (FT)	PTH (FT)	ELEV. (FT)
MW-3	11/28/89	6349	-	11/28/89	-	7.49	-	92.95
Installed 11/28/89	3/3/92	438	-	1/29/91	-	7.38	-	93.06
MPE= 100.44	1/8/93	617	-	11/5/91	-	7.73	-	92.71
	4/8/93	2810	-	3/3/92	-	7.39	-	93.05
	10/5/93	261	-	1/8/93	-	7.35	-	93.09
	11/22/94	53	-	4/8/93	-	6.67	-	93.77
	6/13/95	462	2300	10/5/93	-	8.36	-	92.08
	9/20/95	ND	96	12/23/93	-	7.01	-	93.43
	1/17/96	283	370	6/24/94	-	7.63	-	92.81
	5/22/97	118	300	6/13/95	-	7.73	-	92.71
	6/10/98	ND	52	9/20/95	-	8.66	-	91.78
	12/2/98	4	28	1/17/96	-	7.55	-	92.89
				5/22/97	-	7.13	-	93.31
				6/9/98	-	9.24	-	91.20
				12/2/98	-	8.61	-	91.83
MW-4	11/28/89	9790	-	11/28/89	-	7.06	-	92.94
Installed 11/28/89	3/3/92	5580	-	1/29/91	-	6.97	-	93.03
MPE= 100.00	1/8/93	8350	-	11/5/91	-	7.32	-	92.68
	4/8/93	7320	-	3/3/92	-	6.97	-	93.03
	10/5/93	27	-	1/8/93	-	6.95	-	93.05
	11/22/94	1000	-	4/8/93	-	6.30	-	93.70
	6/13/95	795	21	10/5/93	-	7.98	-	92.02
	9/20/95	119	9	12/23/93	-	6.60	-	93.40
	1/17/96	549	21	6/24/94	-	7.16	-	92.84
	5/22/97	572	44	6/13/95	-	7.72	-	92.28
	6/10/98	422	23	9/20/95	-	8.61	-	91.39
	12/2/98	1	40	1/17/96	-	7.52	-	92.48
				5/22/97	-	7.10	-	92.90
				6/9/98	-	9.22	-	90.78
				12/2/98	-	8.57	-	91.43

NOTES:

DTW=Depth To Water
DTP=Depth To Product
PTH=Product Thickness
ND=Not Detected

MPE=Measuring Point Elevation (ft)
ELEV=Water Table Elevation; is equal to MPE-(DTW-0.8*PTH)
NS=Not Sampled

GENERAL WELL INFO	WATER QUALITY			GAUGING DATA				
	DATE SAMPLED	TOTAL BTEX (ppb)	MTBE (ppb)	DATE	DTP (FT)	DTW (FT)	PTH (FT)	ELEV. (FT)
MW-5	11/28/89	14.5	-	11/28/89	-	6.64	-	92.97
Installed 11/28/89	3/3/92	3.5	-	1/29/91	-	6.54	-	93.07
M P E = 99.61	1/8/93	ND	-	11/5/91	-	6.88	-	92.73
	4/8/93	20	-	3/3/92	-	6.57	-	93.04
	10/5/93	ND	-	1/8/93	-	6.53	-	93.08
	11/22/94	ND	-	4/8/93	-	6.02	-	93.59
	6/13/95	ND	ND	10/5/93	-	7.48	-	92.13
	9/20/95	ND	ND	12/23/93	-	6.24	-	93.37
	1/17/96	ND	2	6/24/94	-	6.68	-	92.93
	5/22/97	ND	2	6/13/95	-	6.89	-	92.72
	6/10/98	ND	1	9/20/95	-	7.71	-	91.90
	12/2/98	ND	2	1/17/96	-	6.72	-	92.89
				5/22/97	-	6.06	-	93.55
				6/9/98	-	8.16	-	91.45
				12/2/98	-	7.70	-	91.91
MW-6	3/3/92	114.3	-	3/3/92	-	7.42	-	92.39
Installed 3/3/92	1/8/93	41	-	1/8/93	-	7.05	-	92.76
M P E = 99.81	4/8/93	7	-	4/8/93	-	6.55	-	93.26
	10/5/93	4	-	10/5/93	-	8.57	-	91.24
	11/22/94	ND	-	12/23/93	-	6.82	-	92.99
	6/13/95	3.8	17	6/24/94	inaccessible			
	9/20/95	ND	890	6/13/95	-	7.82	-	91.99
	1/17/96	ND	ND	9/20/95	-	8.78	-	91.03
				1/17/96	-	6.77	-	93.04
				5/22/97	not	found/	debris	
				6/9/98	Under Debris			
				12/2/98	Under Debris			

NOTES:

DTW=Depth To Water
DTP=Depth To Product
PTH=Product Thickness
ND=Not Detected

MPE=Measuring Point Elevation (ft)
ELEV=Water Table Elevation; is equal to MPE-(DTW-0.8*PTH)
NS=Not Sampled

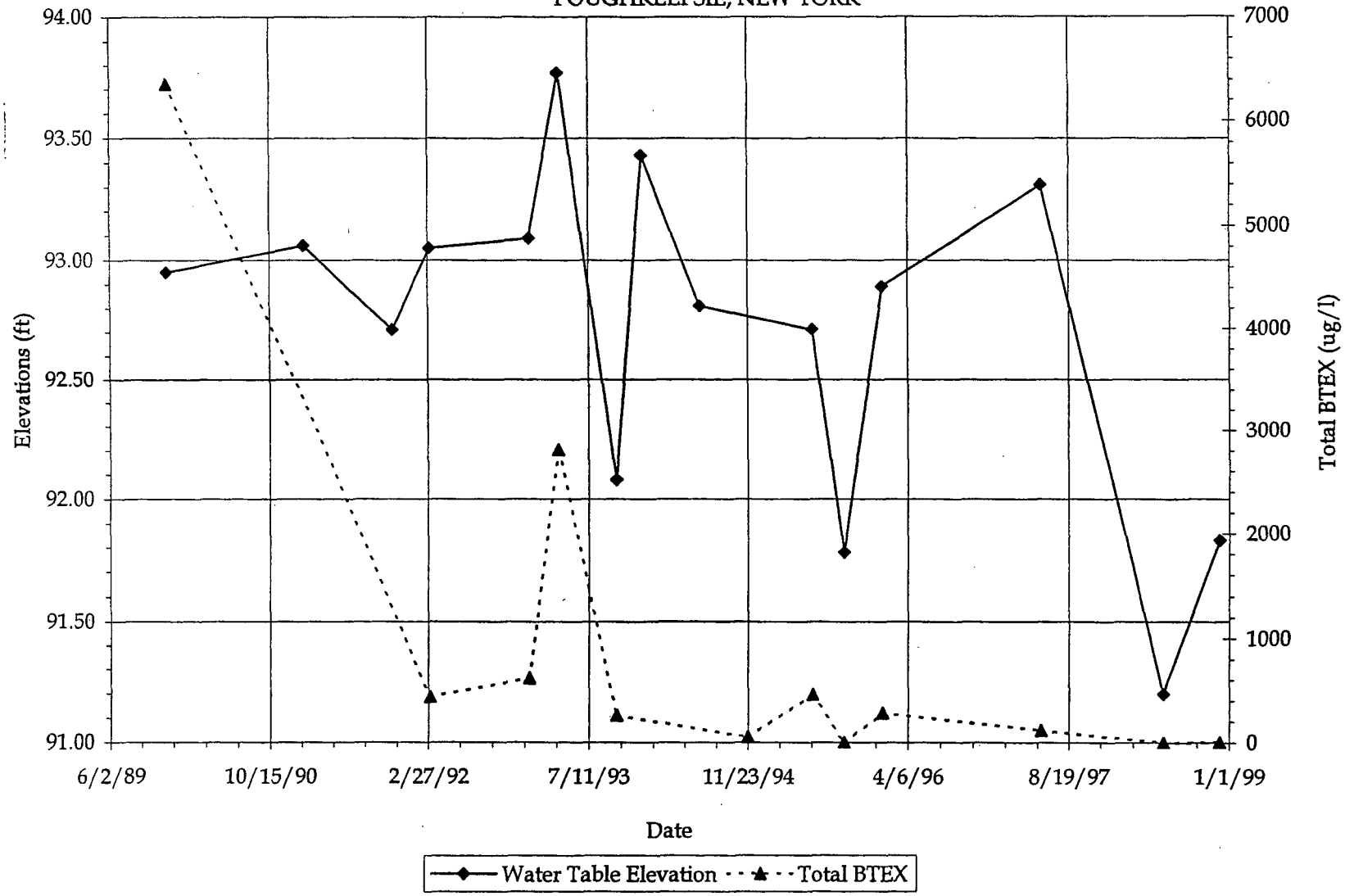
GENERAL WELL INFO	WATER QUALITY			GAUGING DATA				
	DATE SAMPLED	TOTAL BTEX (ppb)	MTBE (ppb)	DATE	DTP (FT)	DTW (FT)	PTH (FT)	ELEV. (FT)
MW-7	3/3/92	ND	-	3/3/92	-	7.99	-	90.98
Installed 3/3/92	1/8/93	ND	-	1/8/93	-	8.04	-	90.93
M P E = 98.97	4/8/93	50	-	4/8/93	-	6.39	-	92.58
	10/5/93	ND	-	10/5/93	-	8.93	-	90.04
	11/22/94	ND	-	12/23/93	-	7.40	-	91.57
	6/13/95	ND	3300	6/24/94	inaccessible			
	9/20/95	5	1300	6/13/95	-	8.58	-	90.39
	1/17/96	ND	400	9/20/95	-	9.53	-	89.44
	5/22/97	ND	44	1/17/96	-	8.20	-	90.77
				5/22/97	-	7.97	-	91.00
				6/9/98	Under Debris			
				12/2/98	Under Debris			
MW-8	3/3/92	ND	-	3/3/92	-	7.27	-	93.28
Installed 3/3/92	1/8/93	ND	-	1/8/93	-	7.25	-	93.30
M P E = 100.55	10/5/93	1	-	4/8/93	6.58	6.60	0.02	93.97
	11/22/94	NS	NS	10/5/93	-	8.33	-	92.22
				12/23/93	-	6.92	-	93.63
				6/24/94	-	7.48	-	93.07
				6/13/95	destroyed			

NOTES:

DTW=Depth To Water
DTP=Depth To Product
PTH=Product Thickness
ND=Not Detected

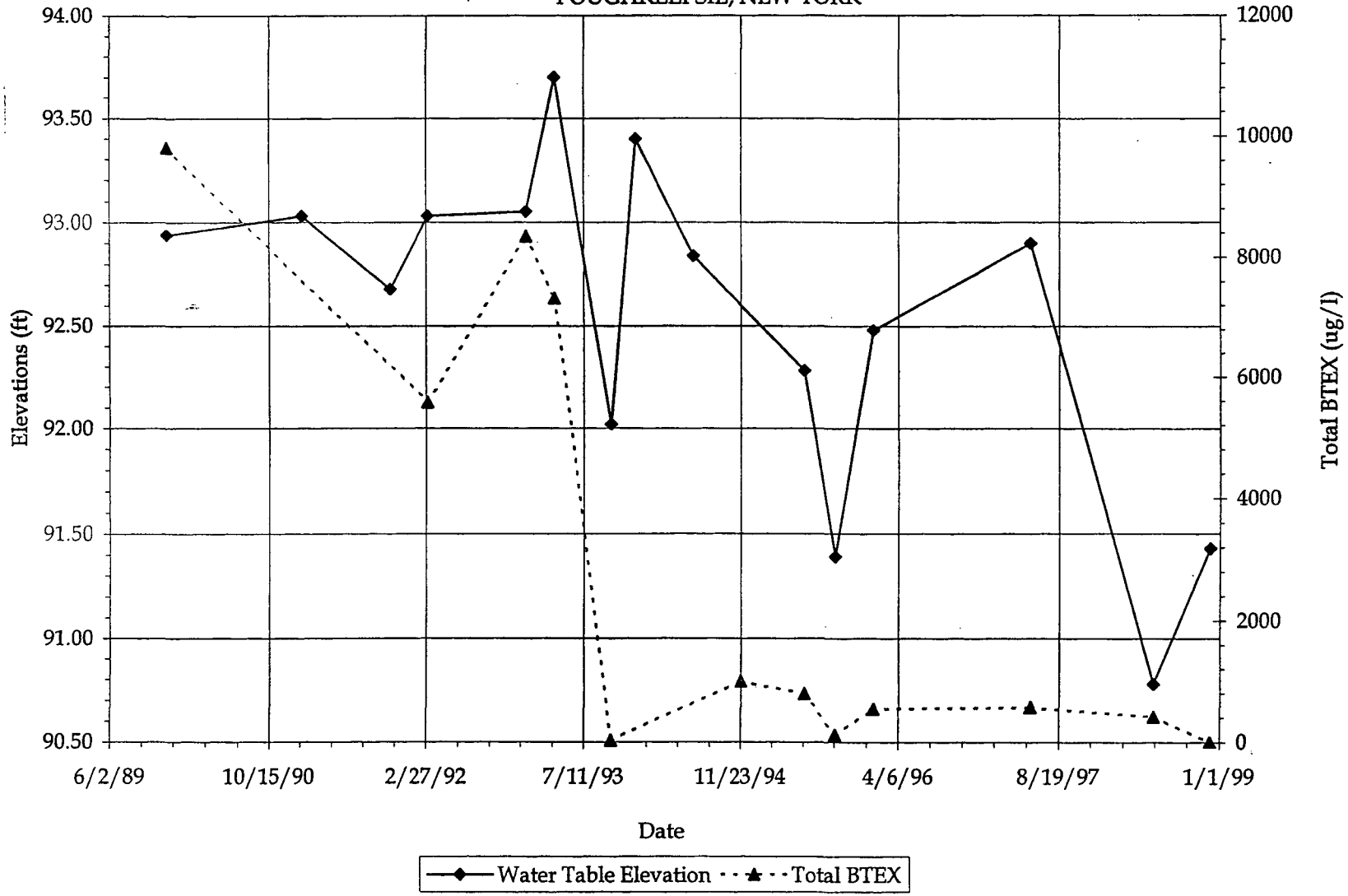
MPE=Measuring Point Elevation (ft)
ELEV=Water Table Elevation; is equal to MPE-(DTW-0.8*PTH)

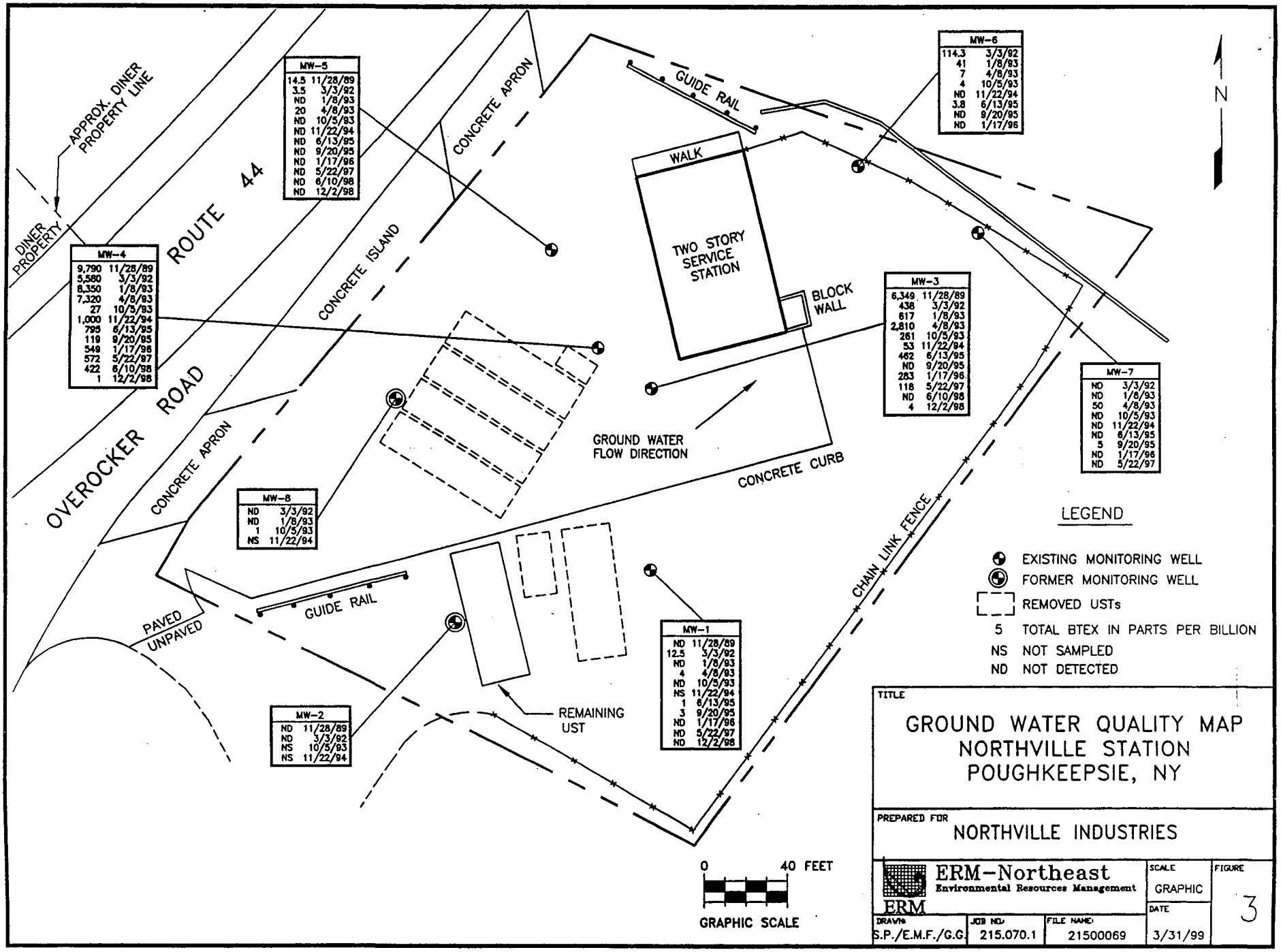
FIGURE 1:
WATER TABLE ELEVATION & TOTAL BTEX CONCENTRATIONS IN MW-3
FORMER NORTHVILLE STATION
POUGHKEEPSIE, NEW YORK



Pghkpse.xls 4/16/99

FIGURE 2:
WATER TABLE ELEVATION & TOTAL BTEX CONCENTRATIONS IN MW-4
FORMER NORTHVILLE STATION
POUGHKEEPSIE, NEW YORK




APPROX. DINER PROPERTY LINE
DINER PROPERTY
ROUTE 44
OVEROCKER ROAD
CONCRETE APRON
CONCRETE ISLAND
CONCRETE APRON
GUIDE RAIL
WALK
TWO STORY SERVICE STATION
BLOCK WALL
GROUND WATER FLOW DIRECTION
CONCRETE CURB
CHAIN LINK FENCE
GUIDE RAIL
PAVED
UNPAVED
REMAINING UST
N
MW-5
14.5 11/28/89
3.5 3/3/92
ND 1/8/93
20 4/8/93
ND 10/5/93
ND 11/22/94
ND 6/13/95
ND 9/20/95
ND 1/17/96
ND 5/22/97
ND 6/10/98
ND 12/2/98
MW-6
114.3 3/3/92
41 1/8/93
7 4/8/93
4 10/5/93
ND 11/22/94
3.8 6/13/95
ND 9/20/95
ND 1/17/96
MW-4
9,790 11/28/89
5,580 3/3/92
8,350 1/8/93
7,320 4/8/93
27 10/5/93
1,000 11/22/94
795 6/13/95
119 9/20/95
549 1/17/96
572 5/22/97
422 6/10/98
1 12/2/98
MW-3
6,349 11/28/89
438 3/3/92
617 1/8/93
2,810 4/8/93
261 10/5/93
53 11/22/94
462 6/13/95
ND 9/20/95
283 1/17/96
118 5/22/97
ND 6/10/98
4 12/2/98
MW-7
ND 3/3/92
ND 1/8/93
50 4/8/93
ND 10/5/93
ND 11/22/94
ND 6/13/95
5 9/20/95
ND 1/17/96
ND 5/22/97
MW-8
ND 3/3/92
ND 1/8/93
1 10/5/93
NS 11/22/94
MW-1
ND 11/28/89
12.5 3/3/92
ND 1/8/93
4 4/8/93
ND 10/5/93
NS 11/22/94
1 6/13/95
3 9/20/95
ND 1/17/96
ND 5/22/97
ND 12/2/98
MW-2
ND 11/28/89
ND 3/3/92
NS 10/5/93
NS 11/22/94
LEGEND
EXISTING MONITORING WELL
FORMER MONITORING WELL
REMOVED USTs
5 TOTAL BTEX IN PARTS PER BILLION
NS NOT SAMPLED
ND NOT DETECTED
0 40 FEET
GRAPHIC SCALE
TITLE
GROUND WATER QUALITY MAP
NORTHVILLE STATION
POUGHKEEPSIE, NY
PREPARED FOR
NORTHVILLE INDUSTRIES
ERM-Northeast
Environmental Resources Management
ERM
SCALE
GRAPHIC
FIGURE
3
DRAWN
S.P./E.M.F./G.G.
JOB NO.
215.070.1
FILE NAME
21500069
DATE
3/31/99

Attachment A

Laboratory Analytical Results
From 12/2/98 Sampling Event

ERM-Northeast
Environmental Resource Management
ERM
175 Froehlich Farm Boulevard • Woodbury, New York 11797 • (516) 921-4300 • Telefax (516) 921-5679 • (516) 921-5637

ERM-Northeast
Chain of Custody

Project Name / No. NORTHVILLE, Poughkeepsie
Project Coordinator / Contact ERNIE ROSSINO
Sampler(s) GD
Bottles Supplied By ECOTEST
Sheet No. 1 of 1

Type and No. of Containers

Date	Time	Comp.	Grab	Sample Identification	Soil	Water	Total No. of Containers	40 ml VOA (No HCl)	Analysis Requested
12/2/98	1236		X	MW-1		X	2	2	602+MTBE
12/2/98	1235		X	MW-3		X	2	2	↓ ↓
12/2/98	1247		X	MW-4		X	2	2	
12/2/98	1258		X	MW-5		X	2	2	602+MTBE

Relinquished By (Signature)	Date/Time	Received By (Signature)	Date/Time	Reason for Transfer
[signature]	12/4/98 1530	[signature]	12/09/98 33	

146621

ECOTEST LABORATORIES, INC. *ENVIRONMENTAL TESTING*

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.985066.01 12/11/98

ERM Northeast
175 Froehlich Farm Boulevard
Woodbury, NY 11797
ATTN: Ernest Rossano

SOURCE OF SAMPLE: Northville, Poughkeepsie, 215.070
COLLECTED BY: Client DATE COL'D:12/02/98 RECEIVED:12/02/98

SAMPLE: Water sample, MW#1, 1226

ANALYTICAL PARAMETERS			ANALYTICAL PARAMETERS
ter.ButylMethylEther	ug/L	17	
Benzene	ug/L	<1	
Toluene	ug/L	<1	
Ethyl Benzene	ug/L	<1	
m + p Xylene	ug/L	<2	
o Xylene	ug/L	<1	

cc:

REMARKS:

DIRECTOR

rn= 29635 NYSDOH ID# 10320

ECOTEST LABORATORIES, INC. *ENVIRONMENTAL TESTING*

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.985066.02 12/11/98

ERM Northeast
175 Froehlich Farm Boulevard
Woodbury, NY 11797
ATTN: Ernest Rossano

SOURCE OF SAMPLE: Northville, Poughkeepsie, 215.070
COLLECTED BY: Client DATE COL'D:12/02/98 RECEIVED:12/02/98

SAMPLE: Water sample, MW#3, 1235

ANALYTICAL PARAMETERS			ANALYTICAL PARAMETERS
ter.ButylMethylEther	ug/L	28	
Benzene	ug/L	4	
Toluene	ug/L	<1	
Ethyl Benzene	ug/L	<1	
m + p Xylene	ug/L	<2	
o Xylene	ug/L	<1	

cc:

REMARKS:

DIRECTOR

rn= 29636 NYSDOH ID# 10320

ECOTEST LABORATORIES, INC. *ENVIRONMENTAL TESTING*

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.985066.03 12/11/98

ERM Northeast
175 Froehlich Farm Boulevard
Woodbury, NY 11797
ATTN: Ernest Rossano

SOURCE OF SAMPLE: Northville, Poughkeepsie, 215.070
COLLECTED BY: Client DATE COL'D:12/02/98 RECEIVED:12/02/98

SAMPLE: Water sample, MW#4, 1247

ANALYTICAL PARAMETERS			ANALYTICAL PARAMETERS
ter.ButylMethylEther	ug/L	40	
Benzene	ug/L	<1	
Toluene	ug/L	<1	
Ethyl Benzene	ug/L	1	
m + p Xylene	ug/L	<2	
o Xylene	ug/L	<1	

cc:

REMARKS:

DIRECTOR

rn= 29637 NYSDOH ID# 10320

ECOTEST LABORATORIES, INC. *ENVIRONMENTAL TESTING*

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.985066.04 12/11/98

ERM Northeast
175 Froehlich Farm Boulevard
Woodbury, NY 11797
ATTN: Ernest Rossano

SOURCE OF SAMPLE: Northville, Poughkeepsie, 215.070
COLLECTED BY: Client DATE COL'D:12/02/98 RECEIVED:12/02/98

SAMPLE: Water sample, MW#5, 1258

ANALYTICAL PARAMETERS			ANALYTICAL PARAMETERS
ter.ButylMethylEther	ug/L	2	
Benzene	ug/L	<1	
Toluene	ug/L	<1	
Ethyl Benzene	ug/L	<1	
m + p Xylene	ug/L	<2	
o Xylene	ug/L	<1	

cc:

REMARKS:

DIRECTOR

rn= 29638 NYSDOH ID# 10320

Environmental
Resources
Management

175 Froehlich Farm Blvd.
Woodbury, NY 11797
(516) 921-4300
(516) 921-5637 (Fax)

RECEIVED
JUL 15 1999
NYS-DEC
REGION 3-NEW PALTZ

14 July, 1999

Mr. Vincent McCabe
New York State Department of
Environmental Conservation
21 South Putt Corners Road
New Paltz, New York 12651-1696

Dutchess

ERM

Via Federal Express

Re: Spill Numbers 90-08720, 91-07867, and 91-08413
Former Northville Service Station
Route 44
Poughkeepsie, New York

FILE COPY

Dear Mr. McCabe:

During a recent (7 July 1999) phone conversation with Mr. David Traver of your office I was informed that you were now managing the subject Spill Cases. Previous project correspondence was sent initially to Karl Weed and then to Mr. Traver when he took over these Spill Cases. On 16 April 1999 ERM sent a letter report to Mr. Traver and a carbon copy to Mr. Peter Doshna. Attached you will find a copy of this report which may or may not have been forwarded to you by either of these parties.

The attached 16 April 1999 letter report contains (then) recent monitoring data and summaries of historical data from the above referenced site. Since then and during the period in which there was apparently confusion over the proper recipient for this correspondence, the site wells were sampled again (on 9 June 1999). This extends the post-remediation monitoring period to more than 4 ½ years. The results are similar to those of previous samplings. Copies of the laboratory results of analyses are attached as they further support the decision to inactivate, if not close, the subject spill cases.

PRINTED ON RECYCLED PAPER

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 3
21 South Putt Corners Road, New Paltz, New York 12561-1696
Phone: (914) 256-3113 FAX: (914) 255-2987

John P. Cahill
Commissioner

DATE: August 13, 1999

Mr. Thomas Maus
Northville Industries Corp.
25 Melville Park Rd.
Melville, N.Y. 11747

REF: Spill No. : 910-7867
Location: Former Northville S/S
Rt 44
Poughkeepsie, N.Y.
County : Dutchess

Dear Mr. Thomas Maus:

The file for the site referenced above has been reviewed and a determination has been made, based on the current information available at this time, including receipt of Report dated: July 14, 1999, from Environmental Resources Management, no further work is required for this site in relationship to the above-noted spill number.
Please Note : Spill Number(s) : 910-8413 & 900-8720, relateded to this site, are also closed and no further work is required in relationship to them at this time.

Sincerely,

Vincent P. McCabe

Vincent P. McCabe
Environmental Engineering Tech. III
NYSDEC Region 3

VPM/ th

cc: P. Doshna/P. DeCicco/ D.Traver
M.Mastro/ D.Weitz
W.Wadsworth/ D.Bendell-SIS, PBS
S.C./Dutchess Co. Health Dept.

Mr. E. Rossano/REM
175 Froehlich Farm Blvd., Woodbury, N.Y. 11797
Mr. D. Sommer, Esq./ Ward, Sommer & Moore,L.L.C.
Plaza Office Center, 122 South Swan St., Albany, N.Y.12210

FAXED 8.13.99
(518) 472 1774

91NFNOTH.WPD

Summary

Northville has remediated the site to the extent practical in conformance with applicable statutory and regulatory provisions for the protection of human health and the environment. Ground water monitoring data collected during the 4 ½ years since active remedial measures were completed show that the ground water has been restored through natural attenuation to the satisfaction of quality standards. Northville has completed the procedures and satisfied all the requirements for "Closed Meets Standards" designation in conformance with the Department's Spill Guidance Manual (SGM), as presented in the NYSDEC memorandum dated 23 February 1998. Accordingly, we respectfully request on Northville's behalf that the subject spill case nos. 90-08720, 91-07867, and 91-08413 be designated "Closed Meets Standards".

Please inform Northville if the department requires additional information or documentation in order to issue a "Closed Meets Standards" designation. If you should have any questions or comments, please call Tom Maus of Northville at (516) 753-4364 or myself at (516) 921-4300.

Very Truly Yours,

Ernest Rossano

Ernest Rossano, C.P.G.
Group Manager

cc: D. Traver, NYSDEC Region 3 (with partial enclosure)
P. Doshna, NYSDEC Region 3 (with partial enclosure)
T. Maus, Northville Industries Corp. (with partial enclosure)
M. Nesheiwat, Gas Land Petroleum (with partial enclosure)

Note: Partial enclosure means copies of the 6/9/99 sampling results.

Laboratory Analytical Results
From 6/9/99 Sampling Event

ECOTEST LABORATORIES, INC. *ENVIRONMENTAL TESTING*

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.992456.01 06/17/99

ERM Northeast
175 Froehlich Farm Boulevard
Woodbury, NY 11797
ATTN: Ernest Rossano

SOURCE OF SAMPLE: Former Northville s/s, Poughkeepsie *
COLLECTED BY: Client DATE COL'D:06/09/99 RECEIVED:06/10/99

SAMPLE: Water sample, MW#1, 1205

ANALYTICAL PARAMETERS			ANALYTICAL PARAMETERS
ter.ButylMethylEther	ug/L	20	
Benzene	ug/L	<1	
Toluene	ug/L	<1	
Ethyl Benzene	ug/L	<1	
m + p Xylene	ug/L	<2	
o Xylene	ug/L	<1	

cc:

REMARKS: * #215.070.1.

DIRECTOR

rn= 15030 NYSDOH ID# 10320

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTING

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.992456.02 06/17/99

ERM Northeast
175 Froehlich Farm Boulevard
Woodbury, NY 11797
ATTN: Ernest Rossano

SOURCE OF SAMPLE: Former Northville s/s, Poughkeepsie *
COLLECTED BY: Client DATE COL'D:06/09/99 RECEIVED:06/10/99

SAMPLE: Water sample, MW#3, 1311

ANALYTICAL PARAMETERS			ANALYTICAL PARAMETERS
ter.ButylMethylEther	ug/L	25	
Benzene	ug/L	<1	
Toluene	ug/L	<1	
Ethyl Benzene	ug/L	<1	
m + p Xylene	ug/L	<2	
o Xylene	ug/L	<1	

cc:

REMARKS: * #215.070.1.

DIRECTOR

rn= 15031 NYSDOH ID# 10320

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTING

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.992456.03 06/17/99

ERM Northeast
175 Froehlich Farm Boulevard
Woodbury, NY 11797
ATTN: Ernest Rossano

SOURCE OF SAMPLE: Former Northville s/s, Poughkeepsie *
COLLECTED BY: Client DATE COL'D:06/09/99 RECEIVED:06/10/99

SAMPLE: Water sample, MW#4, 1335

ANALYTICAL PARAMETERS			ANALYTICAL PARAMETERS
ter.ButylMethylEther	ug/L	2	
Benzene	ug/L	1	
Toluene	ug/L	<1	
Ethyl Benzene	ug/L	1	
m + p Xylene	ug/L	18	
o Xylene	ug/L	<1	

cc:

REMARKS: * #215.070.1.

DIRECTOR

rn= 15032 NYSDOH ID# 10320

ECOTEST LABORATORIES, INC. *ENVIRONMENTAL TESTING*

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777 • FAX (516) 422-5770

LAB NO.992456.04 06/17/99

ERM Northeast
175 Froehlich Farm Boulevard
Woodbury, NY 11797
ATTN: Ernest Rossano

SOURCE OF SAMPLE: Former Northville s/s, Poughkeepsie *
COLLECTED BY: Client DATE COL'D:06/09/99 RECEIVED:06/10/99

SAMPLE: Water sample, MW#5, 1349

ANALYTICAL PARAMETERS			ANALYTICAL PARAMETERS
ter.ButylMethylEther	ug/L	<1	
Benzene	ug/L	<1	
Toluene	ug/L	<1	
Ethyl Benzene	ug/L	<1	
m + p Xylene	ug/L	<2	
o Xylene	ug/L	<1	

cc:

REMARKS: * #215.070.1.

DIRECTOR

rn= 15033 NYSDOH ID# 10320

FEB 1 3 2003
REGION 3-NEW PALTZ

SITE SUMMARY REPORT

MOBIL FACILITY #98-DUT
196 DUTCHESS TURNPIKE
POUGHKEEPSIE, NEW YORK
SPILL #94-07951

Prepared for:

EXXONMOBIL REFINING & SUPPLY COMPANY
464 DOUGHTY BOULEVARD
2ND FLOOR/ENVIRONMENTAL
INWOOD, NEW YORK 11096-1342

Prepared by:

Groundwater & Environmental Services, Inc.
25 Jon Barrett Road
Robin Hill Corporate Park
Patterson, New York 12563
(845) 878-8067

February 12, 2003

SITE SUMMARY REPORT

February 12, 2003

Mobil Facility #98-DUT
196 Dutchess Turnpike
Poughkeepsie, New York

ExxonMobil Contact: Richard Ciccotelli

Background

On September 15, 16, and 23, 1994, Land Tech Remedial performed a subsurface investigation including test pit excavations, GPR survey, and a water well search. As reported by Land Tech Remedial, a Mobil service station occupied the site during the 1970's. Mobil reported removing the gasoline UST's in 1976 and abandoning the site. The site has been vacant from 1976 to the present. The only remnants of the service station are the concrete foundation and drive mats associated with the two former pump islands. Excavation in the in the floor of the building slab implies a former hydraulic lift or bay drain was removed from the service area of the building. Trenching revealed a three-inch iron pipe extending fifteen feet off the northeast corner of the building at a depth of three feet. It terminated into a "drywell" constructed of rusted steel sidewalls and filled with fine-grained gravel. There was no indication of a top or bottom on the structure. A test pit was dug and analytical results indicated both the soil and groundwater samples were ND.

Twenty-two (22) soil samples were collected and twenty-seven (27) water samples were collected. In all cases MtBE was not detected. Total maximum soil BTEX concentrations were detected at 71,879 ppb, 4-7 feet from grade within the UST area. Total maximum groundwater BTEX concentrations were reported at 48,286 ppb and were detected down-gradient the southern former pump island and UST area. Groundwater samples analyzed by Hydrocarbon Screening revealed distribution of BTEX compounds with higher benzene concentrations than Xylene concentrations, little to no toluene concentrations and the absence of MtBE. This result implies the source of contamination is an old (20 years of more) and highly degraded gasoline.

The NYSDEC Spill #94-07951 was issued on September 15, 1994, after receiving the analytical results of the initial soil samples.

Site geology consists of brown to gray silt, fine-grained sand and rock fragments from 2-5 feet below grade. Borings located on the eastern side if the site were completed to refusal at bedrock, approx. 3-5 feet from grade. Borings located in the former tank area and to the west surrounding the pump islands were completed to depths of 11 – 15 feet from grade and consisted of dark brown to gray medium-grained sand with some rock fragments at 5-9 feet from grade. A layer of gray silt, some clay, and little fine-grained sand was observed from 9-15 feet from grade. Bedrock extends from 3 feet below grade in the eastern section of the site to 15 feet below grade in the western section of the site.

Average depth to groundwater on this day was 5.15' (ft) and groundwater elevations indicated flow was toward the east.

Water Well Search and Inventory

Potable water is supplied to the area properties by the Poughkeepsie Water Department, via the Hudson River (approximately 5 miles to the west). However, it has been reported that vacant properties to the east (206 Dutchess Turnpike) and west across Overlook Road are not supplied by city water. Residence at 11 Overlook Road, bordering the site to the south, utilizes a potable well. Also, two residential properties, located 1,500 feet south of the site 207 and 211 Overocker Road utilize private supply wells. Wells were last observed on both properties September 1994.

Remediation History

On June 29, 1995 approximately 168 tons of soil was excavated from the vicinity of the former tank pit area and pump island. On July 17, 1995 the excavated soil stockpile was removed from the site and properly disposed. Seven monitoring wells, three bedrock and four overburden, were installed on-site during August 17 through 22, 1995. On September 15, 1995 samples were collected from all the on-site wells and analyzed via EPA Method 602 + MtBE (see Table 1, Sept. 15, 1995).

Correspondence On Record

- September 19, 1993 – From Dennis R. Arnold (Arnold Associates) to Joyce T. Shirazi (Mobil Oil Corporation).
  - Re: Acknowledgment of ownership of property and discovery of "hazardous substance". Attached was a copy of lease agreement between former owners of the property, Ralph and Mary Adams, and Socony Oil Company, dated May 16, 1956. Lease was terminated with Mobil in 1977. At the request of NYDEC, Mr. Arnold inquired if UST's were definitely removed, was there a report, and what was the exact date Mobil vacated the property.
- September 20, 1993 – From Dennis R. Arnold (Arnold Associates) to Vincent P. McCabe (NYSDEC).
  - Re: Enclosed a copy of above letter to Joyce T. Shirazi (Mobil Oil Corporation).
- September 27, 1993 – From Joyce T. Shirazi to Dennis R. Arnold.
  - Re: Confirming receipt of letter dated September 19, 1993 and action taken (internal record search).
- October 7, 1993 – From Dennis R. Arnold to Vincent P. McCabe.
  - Re: Letter, with enclosed copy of Ms. Shirazi's confirmation receipt of his letter and her actions taken.
- October 4, 1994 – From Michael A. Lamarre (Mobil Oil Corporation) to Karl H. Weed (NYSDEC).

- Re: Cover letter summarizing subsurface investigation and request of authorization to excavate impacted soils and install monitoring wells to determine trends within the subsurface.

- November 19, 1994 – Letter from Mike Lamarre to Fred Schaeffer, Esq.
  - Re: Letter confirming the need for written assurances in regard to the purchase of the property and the hydrocarbon impacts associated.
- November 30, 1994 – Letter from Fred Schaeffer, Esq. to Richard Mitchell, Esq.
  - Re: Rescinds contract offer, requests return of the binder and down payment.
- February 17, 1995 – Letter from Mike Lamarre to Dennis Arnold.
  - Re: Letter stating Mobil's responsibilities in regard to potential divestments.
- June 2, 1995 – Letter from Mike Lamarre to Dennis Arnold.
  - Re: Outlining plans for excavation and monitoring well installation.
- August 9, 1995 – Letter from Mike Lamarre to Arthur Gellert, Esq.
  - Re: Mobil excavated 160 tons of soil and installation of monitoring wells.
- August 17-22, 1995 – Three bedrock and four overburden monitoring wells were installed onsite.
- August 18, 1995 – Letter from Richard Mitchell (attorney for D. Arnold) requesting payment.
- August 26, 1995 – Access agreement to Dan Adams of Adam's Fairacre Farms, Inc., signed to Dan Adams.
- August 27, 1995 – Letter from L.D. Huggins (Capsco) to Richard Mitchell.
  - Re: Offers to consider paying if substantiated, but will not buy property.
- September 15, 1995 – Groundwater samples were collected frono all the onsite samples
- September 18, 1995 – Letter from Richard Mitchell to Robert D. Jiaconia (Regional Claims Manager, Capsco).
  - Re: Renew of claim in regard to damages associated with divestment complications due to hydrocarbon impacts.
- September 25, 1995 – Letter from Timothy D. Foster Land Tech Remedial, Inc.) to Mike Lamarre.
  - Re: Work completed in association with remediation project.
- September 27, 1995 – Letter from L.D. Huggins to D. Arnold
  - Re: Offers to consider paying if substantiated, but will not buy property.
- April 2, 1996 – Letter from Mike Lamarre to Karl H. Weed.
  - Re: Referencing meeting and requesting "No Further Action" status.

Prepared by:

For: Ralph Schimmenti

Ralph Schimmenti
Geologist

Reviewed by:

Eric Harvey
Project Manager

Mobil Oil Corporation

464 DOUGHTY BOULEVARD
INWOOD, NEW YORK 11696-1342

April 2, 1996

New York State Department of
Environmental Conservation
Region 3 - Spills Management
21 South Putt Corners Road
New Paltz, New York 12561
ATTN: Mr. Karl H. Weed

Former Mobil Station
SS# 98-DUT
196-214 Dutchess Turnpike
Poughkeepsie, New York
NYSDEC Spill #: 94-07951

Dear Mr. Weed:

This letter is a follow-up to our meeting on February 21, 1996, and notes made in reference to the above noted service station. During our meeting, we reviewed the latest groundwater sampling results which indicated little-to-no residual hydrocarbons remaining in the groundwater. In addition, Mobil has removed a majority of the source area through excavation, a total 168.31 tons.

Based upon this information, it was determined that a "No Further Action" status would be applicable for this site. Please sign where indicated below that you concur with the above noted notes and to grant "No Further Action" status. If there are any questions and/or comments, please contact me at (203) 775-4474.

Sincerely,

Michael A. Lamarre
Environmental Engineer

Mr. Karl H. Weed - NYSDEC Region 3
Reviewed and Approved

\wpdocs\closure.dut

Land Tech Remedial, Inc.

September 25, 1995

Michael A. Lamarre
Mobil Oil Corporation
464 Doughty Blvd.
Inwood, NY 11696

RE: Former Mobil Station 98-DUT
Poughkeepsie, New York

Dear Mr. Lamarre;

The following list briefly details work completed at the above referenced site:

- On June 29, 1995 approximately 168 tons of soil was excavated from the vicinity of former tank area and pump island. Soils were stocked piled on-site and sampled for disposal protocol. All excavation was then backfilled with clean material.

- The analytical data was approved for disposal. The soils were removed from the site on July 17, 1995 and trucked to "Ted Ondrick Construction Company" for destruction by asphalt batching.

- Seven (7) monitoring wells, three bedrock and four overburden, were installed on-site during August 17 - 22, 1995. The three (3) bedrock wells were located on the downgradient side of the site. The overburden wells were located within the former tank area, adjacent the former pump islands, and on the downgradient edge of the site.

- On September 15, 1995 samples were collected from all of the on-site wells. Sampling protocol was followed during sampling procedures. Samples were sent to Mobil ESL Laboratories under Chain of Custody format for analysis by EPA Method 602 + MtBE. Table 1 (attached) details the analytical results.

If you have any questions at this time, please call me at (203) 261-2673.

Cordially,
Land Tech Remedial, Inc.

Timothy D. Foster
Senior Project Manager

569 Main Street
Monroe, Connecticut 06468
Tel: (203) 261-2673 Fax: (203) 261-4941

Table 1

Former Mobil SS# 98-DUT
196 Dutchess Turnpike
Poughkeepsie, New York

Groundwater Quality

September 15, 1995

Parameter	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
Benzene	ND	ND	ND	ND	87	ND	ND
Toluene	ND	ND	ND	ND	45	ND	ND
Ethylbenzene	ND	ND	ND	ND	168	ND	ND
Xylenes	ND	ND	ND	ND	181	ND	ND
Total BTEX	ND	ND	ND	ND	481	ND	ND
MtBE	3.1	3.3	3.1	ND	120	ND	3.3

Note: All units displayed in ug/l or parts per billion (ppb)
ND - Not Detected
BTEX - Equals the sum of benzene, toluene, ethylbenzene, xylenes
MtBE - Methyl-tertiary-Butyl-Ether

Environmental Site Assessment

Former Mobil Service Station
196 Duthess Turnpike
Poughkeepsie, New York

NYDEC Spill# 94-07951

September 1994

Prepared For: Mobil Oil Corporation
50 Broadway
Hawthorne, NY 10532

Prepared By: Land Tech Remedial, Inc.
569 Main Street
Monroe, CT 06468
(203) 261-2673

David H Lucas
Field Supervisor

Timothy D. Foster
Project Manager

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1.0 INTRODUCTION AND OBJECTIVES

On September 15, 16, and 23, 1994, Land Tech Remedial, Inc. (LTR) completed a limited subsurface investigation at a former Mobil Oil Corporation (Mobil) service station in Poughkeepsie, New York. The investigation utilized the expedited site closure approach (ESCA®) methodology.

The essential tasks completed for this investigation were defined as follows:

- Determine the distance and direction to any public water supply wells within a 2,500 feet radius of the site, and any private supply wells or surface water bodies within 1,000 feet of the site;
- Utilizing a field magnetometer survey, determine the possible location (if any) of underground storage tank (USTs) remaining on-site, and any drywells or bay drains installed on-site;
- Collect representative soil and groundwater samples from boring points near the former gasoline USTs, pump islands, adjacent to the waste oil tank and fuel oil tank (if applicable), and any underground structure detected in the field;
- Determine the soil and groundwater quality beneath the site utilizing on-site mobile laboratory facilities.

Specifically, this investigation incorporated the installation of thirty-two (32) soil borings and the collection of 36 soil samples and 27 groundwater samples from across the site. Soil and groundwater samples were analyzed on-site by portable gas chromatograph (GC) utilizing EPA Method 3810. Furthermore, it was proposed that the investigation would be completed over a period of two (2) days. A third day of investigation was initiated following the results of the second day. The third day included collecting groundwater samples from the western, downgradient side of the site, and investigating the subsurface behind the site building for any discharge pipes or drywells associated with the former service bays.

2.0 SITE DESCRIPTION AND GROUNDWATER QUALITY DETERMINATION

2.1 Site Description

The former Mobil service station is located at 196 Dutches Turnpike (NY Route 44), at the intersection with Overlook Road, in Poughkeepsie, New York. Mobil reportedly divested from the site during 1976, and the property has been vacant ever since. Primary building improvements have been destroyed. The concrete floor from the former building remains on-site. Excavation in the parking area north of the building floor indicates the former location of the gasoline USTs. Concrete mats surrounding two (2) former pump islands are located on the northern and southern sides of the station area. A 2-inch underground galvanized pipe was observed in the excavated area on the southern pump island. A third concrete mat is located on the eastern side of the site. However, no surface excavation or disturbance indicated a pump island was located at this point. Excavation in the floor of the building slab implies a former hydraulic lift or bay drain was removed from the service area of the building.

Plate 1, entitled *Site Plan*, in Appendix 1 depicts the relative locations of the former service station building and other site features with the respect to adjacent roadways. A wooded area exists in the southern and eastern sections of the site.

Properties proximal to the site include a garden center nursery and fields to the north across Route 44. Residential properties are located directly to the south, and west across Overlook Road. A vacant lot boarders the site on the east and highway commercial properties are located farther east, including a car dealership, diner, and gasoline service station. The Town of Poughkeepsie has zoned the site and surrounding properties to the north and east as BH (Business Highway). Properties to the south and west have been zoned R15 (Single Family Residential).

2.2 Water Well Search and Inventory

A file review at the Poughkeepsie Water Department indicated that site is not connected with potable city water. A search of the site did not reveal any well casing or well cap at or above the surface on the property grounds. Water mains are located under Route 44 on the north side and also on the west side of Overlook Road. According to the Water Department, vacant properties to the east (#206 Dutches Turnpike) and west across Overlook Road (#190 Dutches Turnpike) are not supplied with city water. Residence at #11 Overlook Road, bordering the site to the south, utilizes a potable well. Two (2) residential properties, currently occupied and located at #207 and #211 Overocker Road south of the site approximately 1,500 feet, utilize private supply wells. Wells were observed on both properties.

Potable water is provided to the area properties by the Poughkeepsie Water Department. Ms. Judy Finch of the Water Department reported that the water is supplied from the Hudson River, approximately 5 miles to the west.

3.0 FIELD INVESTIGATION / PROCEDURES

3.1 Subsurface Investigation and Soil Boring Sampling Procedures

On September 15, 16, and 23, 1994, Land Tech completed the subsurface investigation utilizing a truck-mounted hydraulic soil boring apparatus to advance narrow diameter (1- to 1 3/8-inch) soil and groundwater sampling tools. The magnetometer search of the property revealed that underground pipes or an underground tank may be located off the northeast corner of the building. Boring locations were field-spotted based on proximity to the former gasoline USTs, pump islands, and magnetometer survey. A soil boring was also sited in the excavation inside the service area of the building.

Three (3) borings, B-3, B-11 and B-17 were selected as temporary monitoring wells. The purpose of installing these temporary wells was to accurately monitor the depth to groundwater across the site and determine flow direction.

3.2 Soil Sample Analyses

Soil and groundwater samples collected during the investigation were relinquished to Land Tech's mobile laboratory which was temporarily set up at the east corner of the site during the investigation. The mobile laboratory is a closed, weatherproof and temperature controlled environment outfitted with heat, ventilation, and electrical fixtures. A semi-portable GC, SRI Model 8610, equipped with a photoionization detector (PID) and flame ionization detector (FID) in series was used to analyze soil and groundwater samples by Modified EPA Method 3810 for volatile organic aromatics (BTEX) and methyl tertiary butyl ether (MTBE). A more detailed description of the specific analytical equipment, sample preparation system, and the procedures used for sample analyses are included in Appendix 3.

3.3 Site Survey and Well Monitoring

The locations of each boring, temporary monitoring well, and specific points were surveyed relative to an assigned benchmark (elevation = 100.00 feet) on the northwest corner of the station building floor.

Based on water level gauging, the shallow overburden aquifer was encountered at an average depth of 5.15 feet below grade, ranging from 4.66 feet to 5.45 feet below grade across the site. Corrected groundwater levels were used to calculate relative groundwater elevations and interpret the groundwater flow direction. Plate 2, entitled *Inferred Groundwater Contour Diagram,* depicts inferred groundwater contours, and as shown, groundwater flow is toward the west.

4.0 SITE INVESTIGATION: FINDINGS AND INTERPRETATIONS

A total of thirty-two (32) soil borings were completed and sampled during the three day investigation. Soil and groundwater samples were collected from borings B-1 through B-22 on September 15 and 16, 1994. Groundwater samples only were collected from borings B-23 through B-32 on September 23, 1994 during the follow-up investigation. Boring locations are depicted on Plate 1 and 5 in Appendix 2.

4.1 Soil Description

Soils encountered in borings consisted of heterogeneous sediments of brown to gray silt, fine-grained sand, and rock fragments from 2 - 5 feet below grade. Borings located in the eastern section of the site, B-6, B-7, and B-8, were completed to refusal at bedrock, approximately 3 - 5 feet from grade. Several borings were completed to approximately three (3) feet from grade off the southwest and northeast corners of the building. Borings located in the former tank area and to the west surrounding the pump islands were completed to depths of 11 to 15 feet from grade. In the deeper borings, a layer of dark brown to gray medium-grained sand, rock fragments, and some silt was encountered from 5 - 9 feet below grade. Beneath the sand and rock fragments was a layer of gray silt, some clay, and little fine-grained sand to 15 feet from grade. Based on depths achieved during soil boring completions, depth to bedrock extends from 3 feet below grade in the eastern section of the site to 15 feet below grade in the western section of the site.

4.2 Soil Sample Analytical Results

A total of 36 soil samples were collected from borings completed September 15 and 16, 1994 and retained for on-site analyses. Soil sample analytical results from all samples analyzed by gas chromatography utilizing Method 3810 are summarized in Table 1 in Appendix 1. The extent of total BTEX concentrations in soil samples collected from 5 - 7 feet below grade in each boring are depicted on Plate 3 in Appendix 2.

Borings B-1 through B-5 and B-9 through B-17 were located within and surrounding the former USTs and pump islands. Samples were collected at 5 to 7 feet below grade at the top of the water table in all the borings. Samples were then collected every two (2) feet until refusal. The highest BTEX concentration was detected from boring B-4, 7-9 feet, within the UST area at a concentration of 71,879 ppb. The remaining concentrations from borings B-1 through B-5 and B-9 through B-17 ranged from non-detect (ND) to 15,253 ppb. The relatively higher BTEX concentrations were noted in samples from B-4, B-5, and B-14, located in the UST area, and from Borings B-12 and B-16, located in and adjacent to the southwestern pump island. MtBE was not detected in any of the collected soil samples.

The New York State Department of Conservation (NYDEC) was notified of the BTEX concentrations detected in soil samples on September 15, 1994. NYDEC Spill Number 94-07951 was issued for 196 Dutchess Turnpike, Poughkeepsie, New York.

Borings B-6, B-7, and B-8 were completed on the upgradient side of the site and adjacent to the concrete mat near the northeastern entrance. Refusal was encountered in each boring between 3 - 5 feet from grade. Collected soil samples from each boring did not contain and BTEX compounds or MtBE.

Boring B-18 was located inside the building floor plan within the excavation of the service area. Samples collected from 5 - 7 and from 7 - 9 feet below grade were ND for total BTEX and MtBE.

The magnetometer survey indicated a possible pipe or underground tank of the northeast corner of the building. Boring B-19 was located at the highest reading detected with the instrument. Soil samples collected from 5 - 7 feet below grade were ND for total BTEX and MtBE. No underground structures were encountered in boring B-19 and in 3 additional non-sampling borings completed to refusal adjacent to B-19 .

Boring B-20 was located on the downgradient side of the former pump islands and USTs. The sample collected from 5 - 7 feet below grade contained traces of a highly weathered liquid phase hydrocarbon (LPH) product. The 5 - 7 sample contained a total BTEX concentration of 428 ppb. The sample from 7-9 feet did not contain any BTEX compounds. Subsequently, borings B-21 and B-22 were located on the downgradient edge of the property. Again the trace amounts of LPH were observed in the 5 - 7 feet samples. However, relatively low concentrations of BTEX were detected. Specifically, the 5 - 7 feet samples from B-21 contained 22 ppb total BTEX, while the 7 - 9 feet sample was ND. Samples from B-22 were all ND for total BTEX. Again, MtBE was not detected in any soil sample collected.

A third day of investigation was proposed following the observation of LPH in borings B-21 and B-22. Borings would be located in northwestern section of the site for the collection of groundwater samples in order to delineate the LPH plume at the top of the water table.

4.3 Groundwater Sample Analytical Results

Groundwater analytical results from all samples analyzed by gas chromatography utilizing Method 3810 are summarized in Table 2 in Appendix 1. Total BTEX concentrations in groundwater samples collected from each boring are depicted on Plate 4 and 5, in Appendix 2.

Groundwater samples collected from borings within and surrounding the former USTs and pump islands, B-1 through B-5, and B-10 through B-17, contained total BTEX concentrations ranged from ND to 7,671 ppb. Groundwater samples were not collected from boring B-6 through B-9, as refusal was encountered 4 to 5 feet from grade.

Groundwater samples collected from boring B-18 and B-19, located in the building and adjacent to the northeast corner of the building, respectively, did not contain any BTEX compounds or MtBE.

Downgradient borings B-20, B-21, and B-22 contained total BTEX concentrations of 711 ppb, 1,456 ppb, and 4 ppb, respectively.

Additional borings B-23 through B-32 were completed on September 23, 1994. Borings were located in the northwestern section of the site, and only groundwater samples were collected in order to define the boundaries of the LPH. Boring B-32 was located inside the excavated area of the gasoline USTs. Plate 5 details the location of borings completed on September 23. Each boring was completed to 9 feet below grade and a 3/4-inch PVC well screen was installed in each boring. The water sample was collected at 5 - 7 feet from grade in the upper zone of the water table. The highest total BTEX concentration was detected in the groundwater sample from B-29, at 48,286 ppb. The remaining samples collected on September 23 contained total BTEX concentrations relatively lower, ranging from ND (B-27, B-26) to 14,807 ppb (B-31). LPH was observed in samples B-24, B-25, and B-28 through B-31.

5.0 BAY DRAIN AND DRYWELL INVESTIGATION

A trench was excavated outside the south side of the building floor to locate any possible discharge pipes or bay drains associated with the former service bay. A 3-inch iron pipe was uncovered coming off the northeast corner of the building approximately 3 feet below grade and running towards the southeast. The pipe extended approximately 15 feet from the building where it terminated into a "drywell" constructed of a steel sidewalls and filled with fine gravel. The sides of the well were extremely rusted and there was no indication of a top or bottom to containment structure. A test hole was excavated to undistributed soil beneath the drywell where soil and groundwater samples were collected. Plate 6 details the area excavated along the back side of the building and the location of the drywell and sample point. The soil and groundwater samples were submitted to an outside New York State certified laboratory for analysis by EPA Method 8260, modified for Suffolk County Parameters. **Analytical results indicated both the soil and groundwater samples were ND for all constituents listed under the analytical method.**

A test pit was excavated directly downgradient of the western pump island near boring B-29 to the top of the water table in order to collected a large composite sample of groundwater and free product. After groundwater and a heavy film of free product accumulated in the hole, a water sample was skimmed off the surface of the water, grabbing as much hydrocarbon product in a 1-liter sample. The sample was submitted for Hydrocarbon Screening Analysis by GC/FID. This analysis would determine the if the hydrocarbon product was a gasoline, diesel, heating, or lubricating oil based petroleum product. Analytical results indicated 31 ppm of gasoline components, and ND concentrations of all other hydrocarbon products.

6.0 FINDINGS

Based on the results of the subsurface investigation, LTR submits the following conclusions:

- A Mobil service station occupied the site during the 1970s. Mobil reports removing the gasoline USTs in 1976 and abandoning the site. The site has been vacant from 1976 to the present.

- The subject site is not connected to the public drinking water supply system. A site walk of the entire property did reveal any supply well at the surface on-site. According to the Poughkeepsie Water Department, active private potable water wells exist within 1,000 feet of the station. Public water supply is available to the site and surrounding properties.

- Groundwater was encountered at an average depth of 5.15 feet below grade. Relative water table elevations indicate groundwater flow is toward the east.

- Results of soil sample analyses indicates residual hydrocarbons are located in the former gasoline USTs. Soil samples from B-4, located in the area excavated for the USTs contained a total BTEX concentration of 71,879 ppb. Boring B-5 and B-14 also completed in excavated area also contained BTEX concentrations of 9,227 ppb and 10,026 ppb, respectively.

- Soil samples collected from borings downgradient from the former pump island contained liquid phase hydrocarbons. Total BTEX concentrations in soil samples on the downgradient side of the site ranged from ND to 15,253 ppb.

- NYDEC Spill # 94-07951 was issued for the subject property on September 15, 1994 after receiving the analytical results of the initial soil samples.

- MtBE was not detected in soil or groundwater sample collected from across the site.

- A drywell was uncovered on the south side of the building approximately 15 feet from the northeast corner. Analytical results of soil and groundwater samples collected beneath the well did not contain any volatile organic compounds listed by modified EPA Method 8260.

- The relatively highest concentrations of BTEX were found in both soil and groundwater samples located west of the southwestern pump island. Analytical results of soil samples collected from this area indicates higher BTEX concentrations were found in shallower samples rather than in deeper samples. Based on the less permeable deeper soils at 7 feet below grade, and the low BTEX concentrations in samples collected from 7 - 9 feet from grade, the vertical zone of hydrocarbon impacted soils appears to be from 4 to 7 feet below grade.

- Liquid phase hydrocarbon product observed in groundwater samples indicates the free product plume extends from the southwest pump island at B-29 west to B-22 and B-31 located at the entrance off Overlook Road.

- The hydrocarbon product observed in the groundwater samples appeared to be very viscous and would adhere to the sides of the sample containers. Samples analyzed by Hydrocarbon Screening revealed the source of free product is gasoline. The site history, the distribution of the BTEX compounds with higher benzene concentrations than xylene concentrations, little to no toluene concentrations, and the absence of MtBE indicates the source of contamination is an old (20 years or more) and highly degraded gasoline.

Table 1

Mobil Oil Corporation
196 Duthcess Turnpike
Poughkeepsie, New York

Soil Sample Analytical Data

September 15 and 16, 1994

Sample Location	Sample Depth (ft)	Benzene	Toluene	Ethyl-benzene	m-, p-xylenes	o-xylenes	Total BTEX	MTBE
B-1	5 - 7	2,500	ND	453	114	30	3,097	ND
B-2	5 - 7	ND	ND	ND	ND	ND	ND	ND
B-3	5 - 7	ND	ND	ND	ND	ND	ND	ND
B-3	7 - 9	44	ND	22	30	18	114	ND
B-4	5 - 7	4,835	ND	663	58	48	5,154	ND
B-4	7 - 9	27,979	ND	9,696	25,416	8,788	71,879	ND
B-5	5 - 7	6,375	ND	1,721	1,000	131	9,227	ND
B-6	5	ND	ND	ND	ND	ND	ND	ND
B-7	5	ND	ND	ND	ND	ND	ND	ND
B-9	3 - 5	ND	ND	ND	ND	ND	ND	ND
B-9	5 - 7	5	7	3	8	9	32	ND
B-10	5 - 7	ND	ND	ND	ND	ND	ND	ND
B-11	5 - 7	ND	ND	ND	ND	ND	ND	ND
B-11	7 - 9	ND	ND	ND	ND	ND	ND	ND
B-11	13 - 15	ND	ND	ND	ND	ND	ND	ND
B-12	3 - 5	8,048	355	ND	ND	ND	8,403	ND
B-12	5 - 7	4,193	190	258	520	ND	5,161	ND
B-12	7 - 9	25	89	ND	ND	ND	114	ND
B-12	9 - 11	ND	ND	ND	ND	ND	ND	ND

Note: All units displayed in ug/kg or parts per billion (ppb)
Volatile Aromatic Organics by EPA Method 3810
MTBE - Methyl-tertiary-butyl-ether
ND - Not Detected

Table 1
(continued)
Mobil Oil Corporation
196 Dutchess Turnpike
Poughkeepsie, New York

Soil Sample Analytical Data

September 15 and 16, 1994

Sample Location	Sample Depth (ft)	Benzene	Toluene	Ethyl-benzene	m-, p-xylenes	o-xylenes	Total BTEX	MTBE
B-13	5 - 7	ND	ND	ND	ND	ND	ND	ND
B-14	5 - 7	5,286	1,487	1,362	1,891	ND	10,026	ND
B-14	7 - 9	4,086	165	523	2,671	1,757	9,102	ND
B-15	5 - 7	ND	ND	4	13	ND	17	ND
B-16	3 - 5	11,831	ND	1,376	2,046	ND	15,253	ND
B-16	5 - 7	695	20	102	ND	ND	817	ND
B-17	5 - 7	82	ND	ND	ND	ND	82	ND
B-17	7 - 9	ND	ND	ND	ND	ND	ND	ND
B-18	5 - 7	ND	ND	ND	ND	ND	ND	ND
B-18	7 - 9	ND	ND	ND	ND	ND	ND	ND
B-19	5 - 7	ND	ND	ND	ND	ND	ND	ND
B-20	5 - 7	398	ND	16	14	ND	428	ND
B-20	7 - 9	ND	ND	ND	ND	ND	ND	ND
B-21	5 - 7	22	ND	ND	ND	ND	22	ND
B-21	7 - 9	ND	ND	ND	ND	ND	ND	ND
B-22	5 - 7	ND	ND	ND	ND	ND	ND	ND
B-22	7 - 9	ND	ND	ND	ND	ND	ND	ND

Note: All units displayed in ug/kg or parts per billion (ppb)
Volatile Aromatic Organics by EPA Method 3810
MTBE - Methyl-tertiary-butyl-ether
ND - Not Detected

Table 2

Mobil Oil Corporation
196 Dutchess Turnpike
Poughkeepsie, New York

Groundwater Sample Analytical Data

September 15, 16, and 23, 1994

Sample Location	Benzene	Toluene	Ethyl-benzene	m-, p-xylenes	o-xylenes	Total BTEX	MTBE
B-2	17	ND	7	46	28	98	ND
B-3	59	ND	9	12	3	83	ND
B-4	1,188	ND	536	998	192	2,914	ND
B-5	8	ND	2	2	ND	12	ND
B-10	ND	ND	ND	ND	ND	ND	ND
B-11	ND	ND	ND	ND	ND	ND	ND
B-12	4,621	181	766	2,097	ND	7,671	ND
B-13	2	ND	2	3	7	14	ND
B-14	380	224	627	2,727	532	4,490	ND
B-15	ND	ND	ND	ND	ND	ND	ND
B-16	671	ND	697	1,239	29	2,636	ND
B-17	59	216	69	191	ND	535	ND
B-18	ND	ND	ND	ND	ND	ND	ND
B-19	ND	ND	ND	ND	ND	ND	ND
B-20	711	ND	ND	ND	ND	711	ND
B-21	392	88	923	63	ND	1,456	ND
B-22	3	ND	1	ND	ND	4	ND
B-23	34	ND	ND	ND	ND	34	ND
B-24	76	ND	ND	ND	ND	76	ND
B-25	6	ND	35	68	8	117	ND
B-26	ND	ND	ND	ND	ND	ND	ND
B-27	ND	ND	ND	ND	ND	ND	ND
B-28	1,880	116	ND	27	ND	2,023	ND
B-29	25,297	1,046	4,602	12,802	4,539	48,286	ND
B-30	941	96	ND	ND	ND	1,037	ND
B-31	1,554	626	3,055	7,503	2,069	14,807	ND
B-32	165	ND	ND	ND	ND	165	ND

Note: All units displayed in ug/kg or parts per billion (ppb)
Volatile Aromatic Organics by EPA Method 3810
MTBE - Methyl-tertiary-butyl-ether
ND - Not Detected

PORTABLE GAS CHROMATOGRAPHY

Soil and water samples collected for this investigation were prepared for on-site headspace analysis utilizing a portable gas chromatograph (GC). A GC was used to provide a more detailed analysis of each sample including concentrations of specific gasoline constituents such as benzene, toluene, ethylbenzene, p-, m-, and o-xylenes (BTEX), and methyl-tertiary-butyl- ether (MTBE) to a detection level of 1 ug/L (ppb). Further, the relative concentrations and abundance of these constituents in soil samples is a necessary input in an investigation of the extent and degree of contamination and an integral component of an evaluation of remediation requirements and options.

- <u>System Specifications</u>

Gas chromatography was performed on an SRI Model 8610 portable GC equipped with a photionization detector (PID) and flame ionization detector (FID) in series. Data collection and manipulation was handled by the hardware and software of the PeakSimple III Data system. The following operating conditions were kept constant throughout the course of this investigation:

column:	15 meter x 0.53 mm I.D. (5%-Phenyl)-Methylpolysiloxane capillary column
carrier gas:	Ultra high purity Hydrogen at 18 milliliters/minute
oven temp.:	55°C (4 minutes) to 120°C (10°C /minute)
detector:	PID equipped with a 10.2 eV lamp
inj. volume:	100 microliters

- **Analytical Procedure**

The analytical procedure utilized in this investigation is a modification of the static headspace extraction technique outlined in EPA SW-846 Method 3810. The GC was used to provide a detailed analysis of each groundwater or soil sample with regard to concentrations of specific gasoline constituents such as methyl-tertiary-butyl ether (MTBE), benzene, toluene, ethylbenzene, and p-, m-, and o-xylenes. Minimum detection limits for water samples was 1 ug/L (ppb) and for soil was 5 ug/L.

- **QA/QC Requirements**

To assure our ability to generate data of acceptable accuracy and precision, our QA/QC program requires that the gas chromatograph be three point calibrated at least once a day to generate a calibration curve for each analyte. Instrument calibration checks, duplicate sampling, as well as method and equipment blanks were run periodically throughout the day to monitor system performance. Throughout the course of this particular assessment period, a minimum of 20% of our GC injections per day were for QA/QC purposes.

- **Concentration Calculations**

To determine analyte concentrations in water samples, the response factor (Rf) for each analyte in the aqueous standard mixture were calculated each day using the following equation:

$$Rf = \frac{\text{concentration of analyte}}{\text{mean area count of analyte}}$$

The concentration of each component in the headspace sample was then calculated by multiplying the area count for that component by its respective response factor (external standardization).

To determine analyte concentrations in soil samples, the following equation was used:

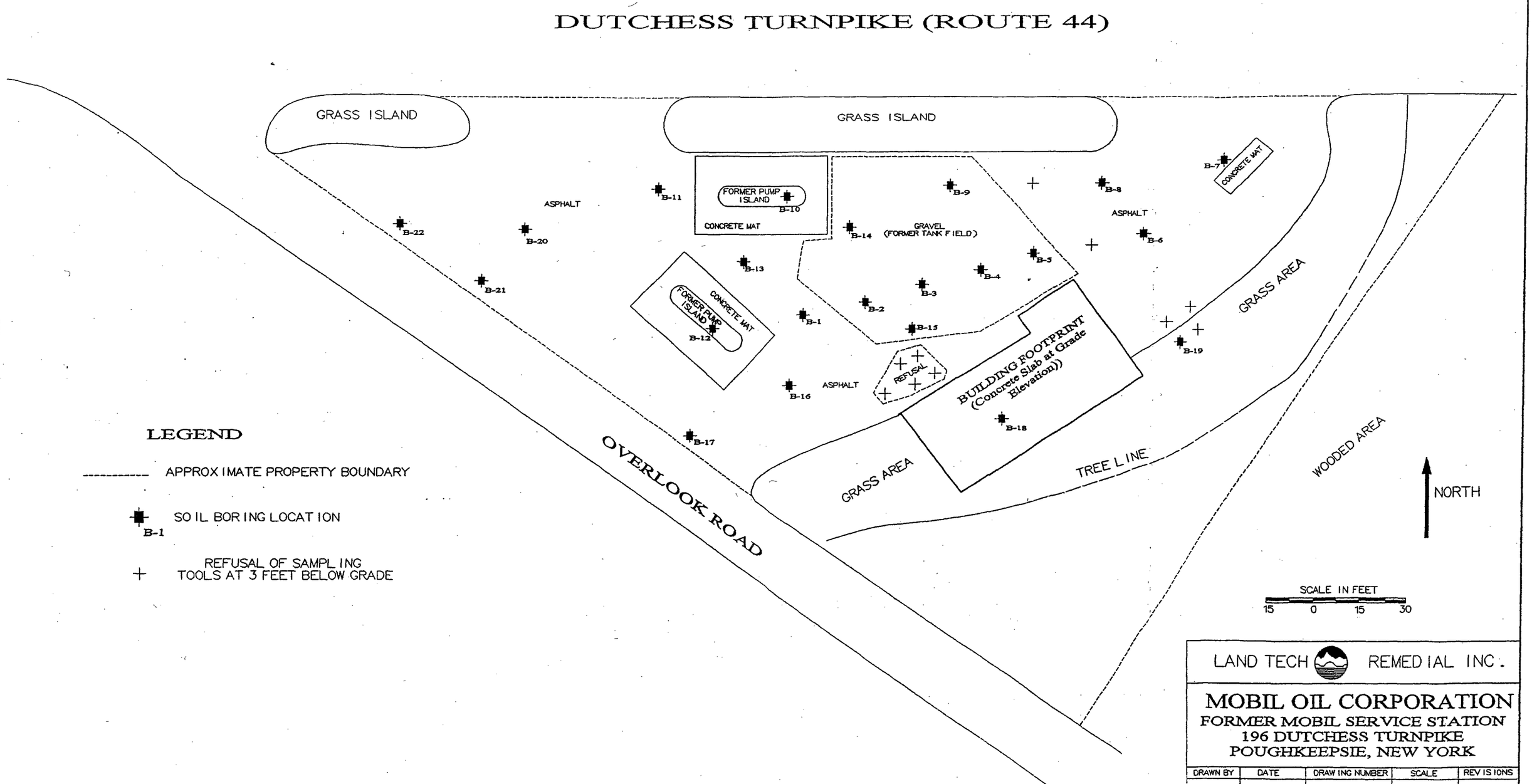
$$C_{i,s} = \frac{C_{hs} / C_{std} * C_{ws} * [1/H_i + V_{hs}/V_w]}{[1/H_i + V_{hss}/V_{ws}] * M_s/V_w}$$

where:

$C_{i,s}$ = concentration of analyte i in the soil

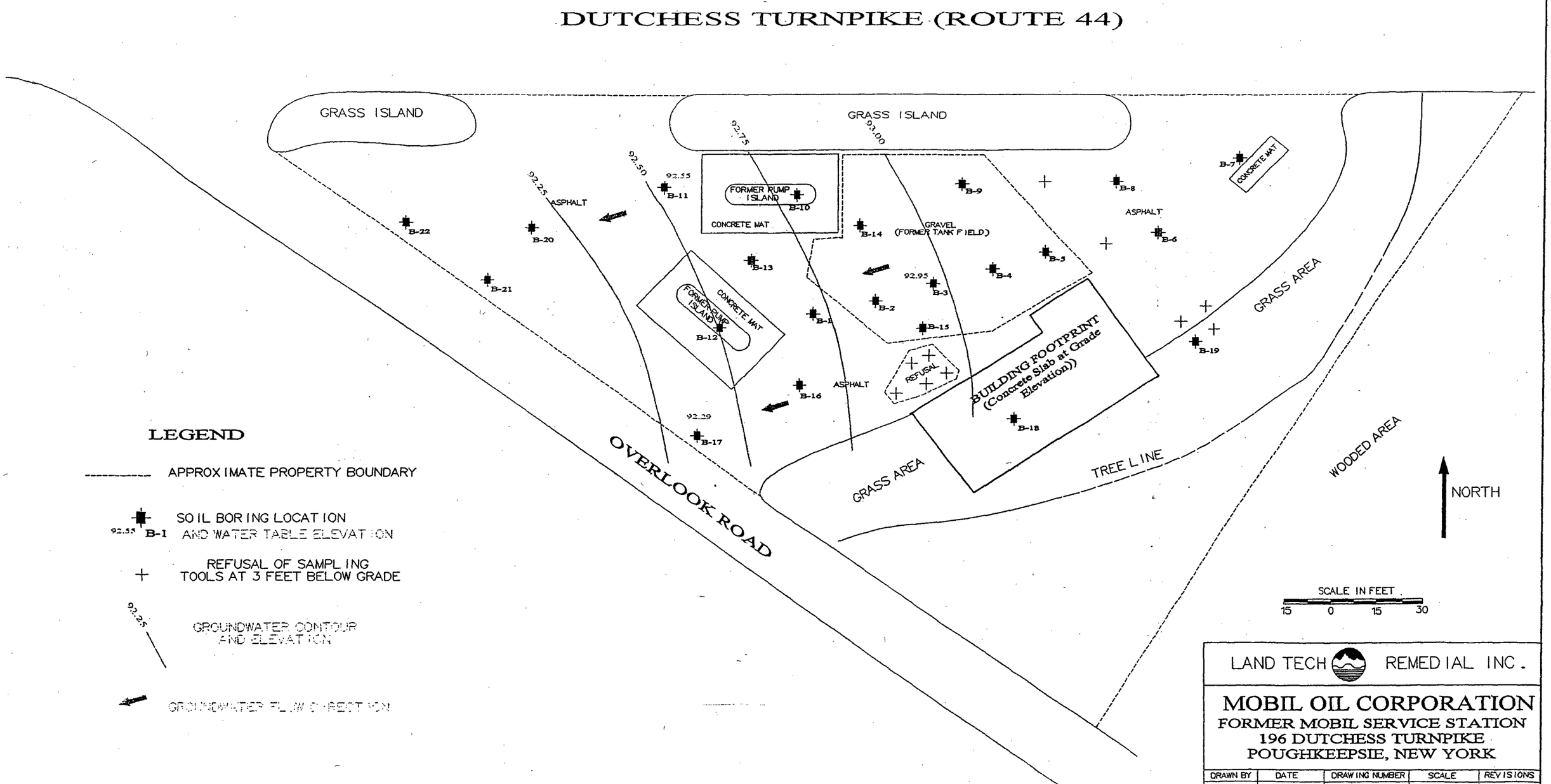
C_{hs} = concentration of analyte i in the headspace
C_{std} = concentration of analyte i in the standard headspace
C_{ws} = concentration of analyte i in the water originally
M_s = mass of soil added to the VOA vial
V_w = volume of water added to the VOA vial
V_{hs} = volume of headspace = 40 mL - V_w(mL) - M_s(g)/(2.65g/mL)
V_{hss} = volume of headspace of standard mixture VOA vial
V_{ws} = volume of water in standard mixture VOA vial
H_i = dimensionless Henry's Law constant for analyte i at 25° C.

PLATE 1
SITE PLAN and
BORING LOCATION DIAGRAM
SEPTEMBER 15 and 16, 1994



DRAWN BY	DATE	DRAWING NUMBER	SCALE	REVISIONS
AJM	9/23/94	11244	1"=30'	

PLATE 2
INFERRED GROUNDWATER CONTOUR DIAGRAM
SEPTEMBER 16, 1994



LAND TECH REMEDIAL INC.

MOBIL OIL CORPORATION
FORMER MOBIL SERVICE STATION
196 DUTCHESS TURNPIKE
POUGHKEEPSIE, NEW YORK

DRAWN BY	DATE	DRAWING NUMBER	SCALE	REVISIONS
AJM	9/23/94	11244	1"=30'	

PLATE 3
TOTAL BTEX CONCENTRATIONS
in SOIL SAMPLES 5 - 7 FEET
SEPTEMBER 15 and 16, 1994

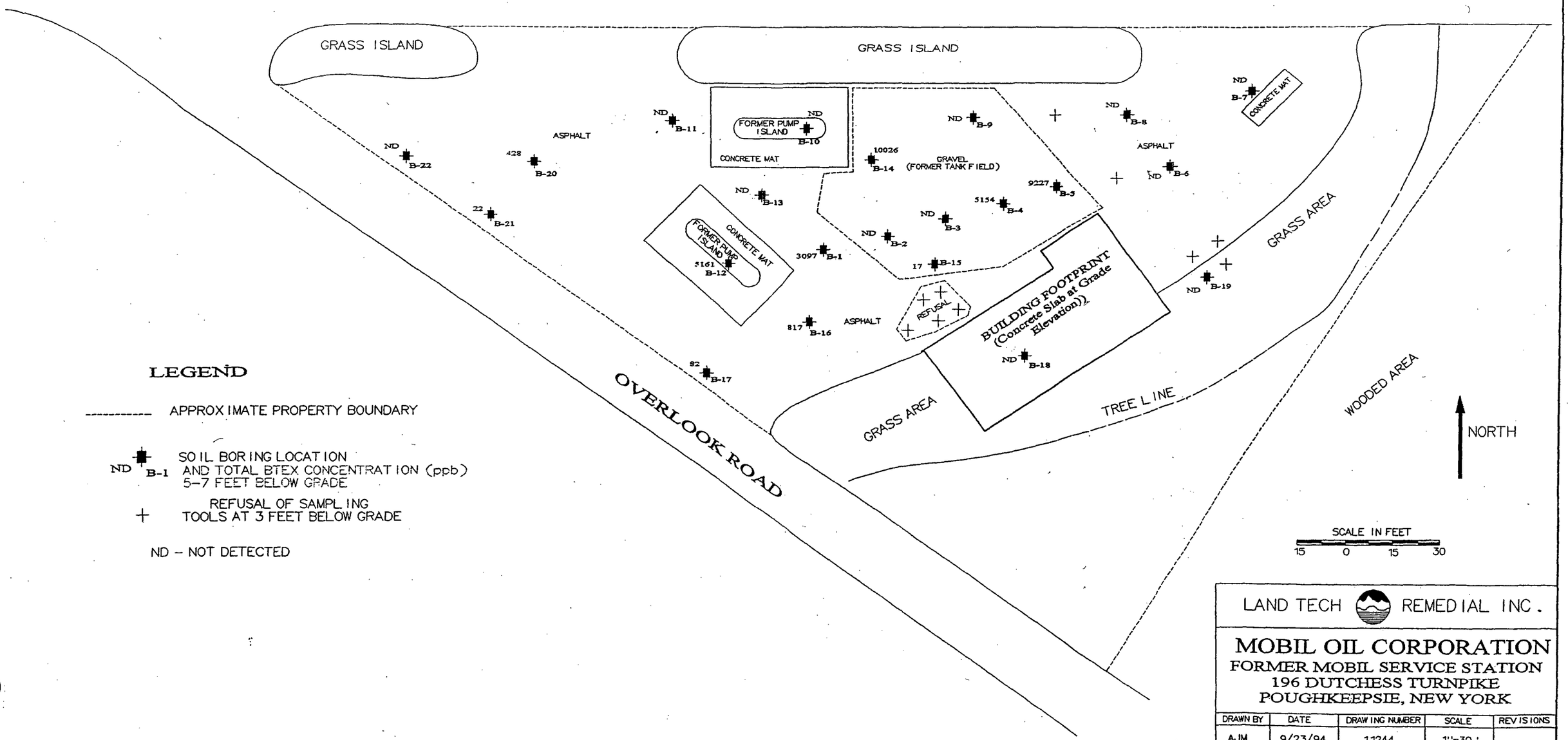


PLATE 4
TOTAL BTEX CONCENTRATIONS
GROUNDWATER SAMPLES
SEPTEMBER 15 and 16, 1994

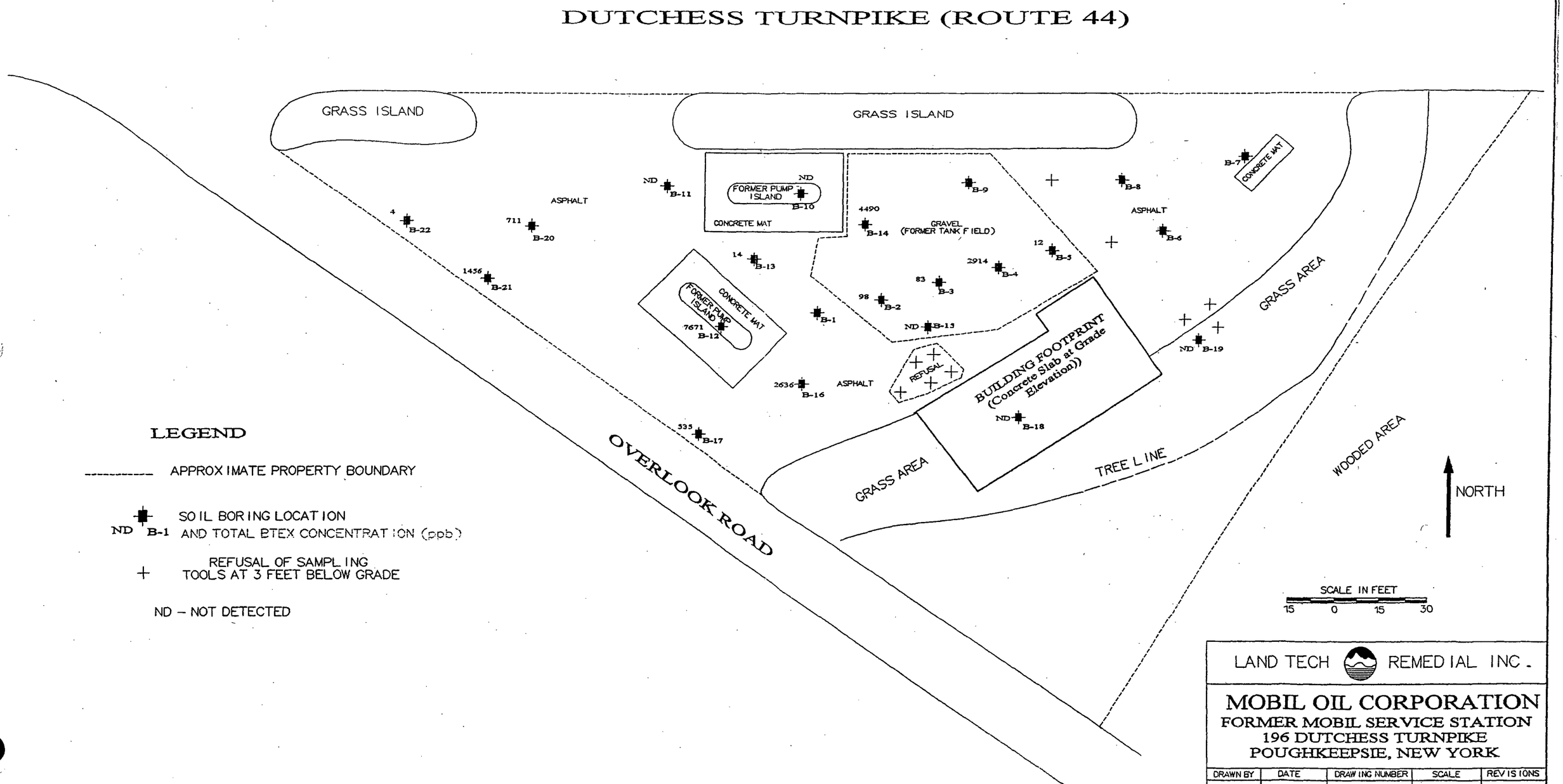


PLATE 5
TOTAL BTEX CONCENTRATIONS
GROUNDWATER SAMPLES
SEPTEMBER 23, 1994

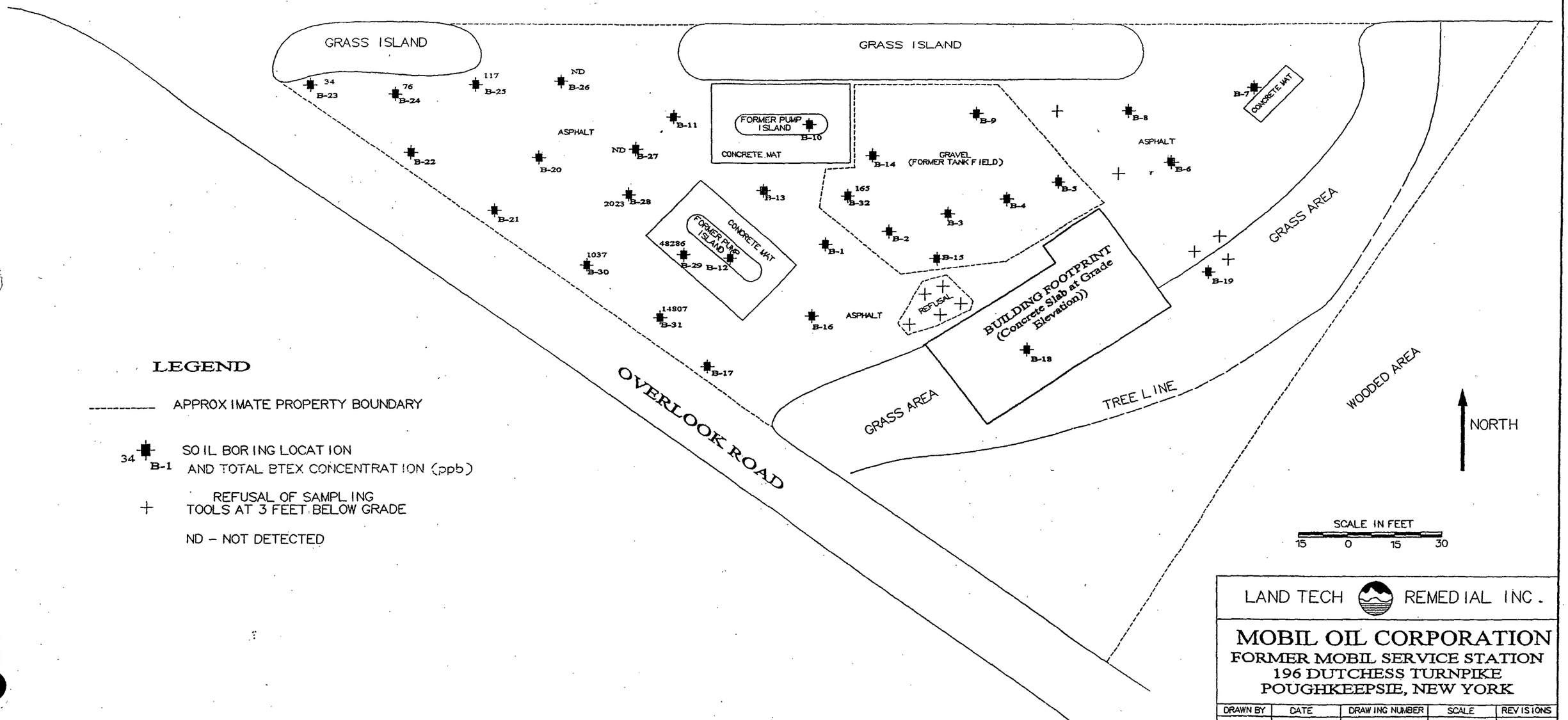
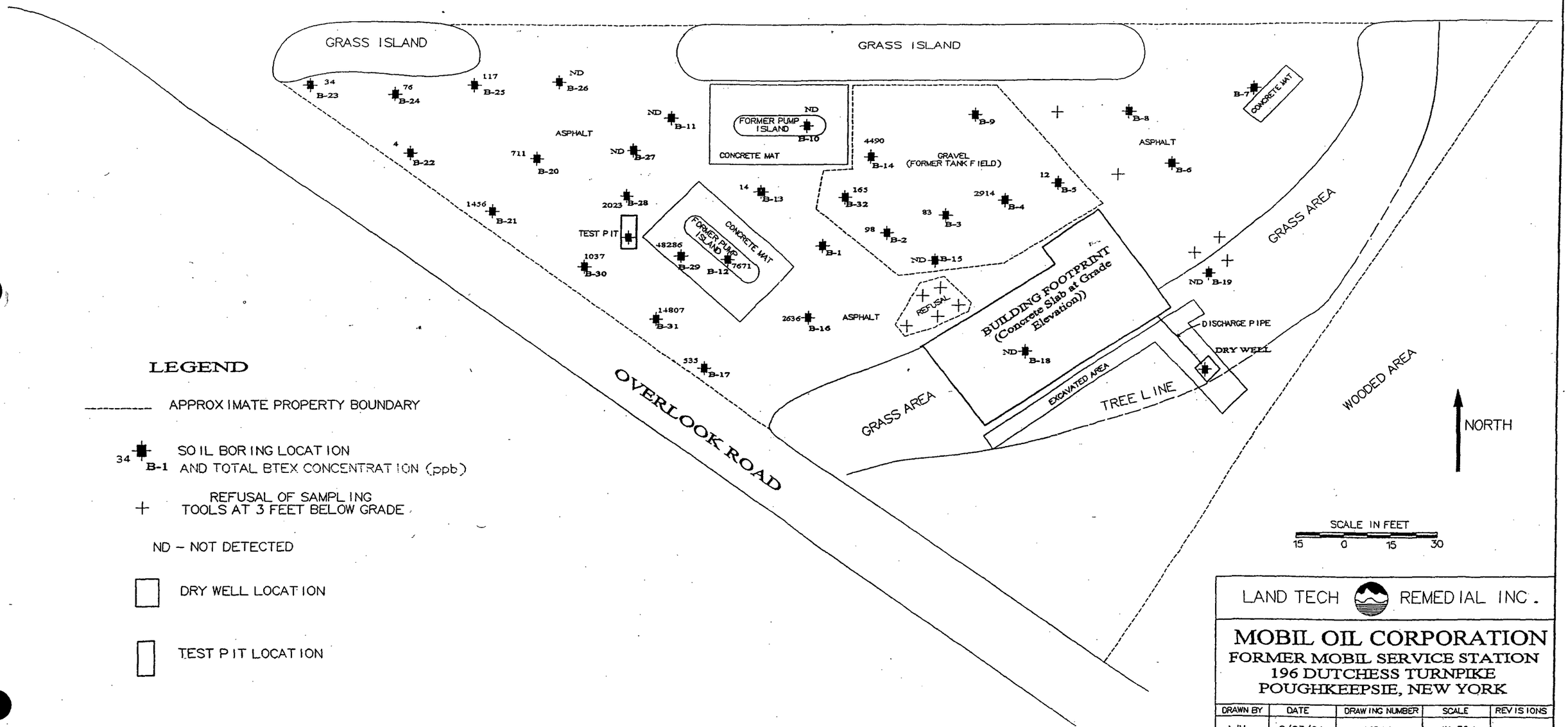


PLATE 6
DRY WELL AND
TEST PIT LOCATION DIAGRAM
SEPTEMBER 23, 1994



APPENDIX C

DETAILS AND DOCUMENTATION FOR THE ROUTE 376 ALTERNATIVE

C-1: Detailed Description, Geologic Well Logs and Physical Data
C-2: Water Quality Data: Laboratory and Field
C-3: Mobil Site and State Road Site

APPENDIX C-1

Detailed Description, Geologic Well Logs and Physical Data

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1 INTRODUCTION

The Route 376 Properties alternative involves a proposed well field located on an undeveloped tract of land along Route 376, immediately north of the village of East Fishkill. This section discusses the groundwater exploration and characterization activities of this alternative.

2 GROUNDWATER EXPLORATION

Preliminary assessment of the Route 376 Properties indicated that the site contained sand and gravel deposits of the Sprout Creek Aquifer, underlain with carbonate bedrock belonging to the Wappingers Group. These characteristics, along with the undeveloped nature and size of the property suggested that the area was suitable for groundwater exploration. Groundwater exploration began on this property in the spring of 2002 with the siting of four preliminary test wells, TW-1, TW-2, TW-3, and TW-4 in low-lying areas of the site. Two additional well sites, TW-3A and TW-4A, were added to the preliminary test well list to better characterize the aquifer beneath two elevated areas on the property. After the necessary temporary wetland access permits were obtained, access roads to each of the drilling sites were constructed and drilling began in August 2002. After drilling began at location TW-3, that well site was changed to a shallow and deep well pair, TW-3S and TW-3D.

Each of these wells were drilled by hollow stem auger method and continuous split spoon samples were collected as deep as possible for sieve analysis. Sample collection continued at several locations by coring after encountering a gravelly and cobbly lodgement till. Dolostone bedrock was encountered at TW-1 and TW-3D, with depth to bedrock increasing toward the south. The wells were constructed in the hollow stem auger borehole as two-inch diameter PVC observation wells with fully-penetrating screens set in the sand and gravel unit encountered beneath a relatively thick surficial fine sand and silt unit believed to represent a glacial lacustrine deposit. The sand and gravel deposit varied in thickness across the site, but generally thickened toward the south and was underlain by a dense lodgement till. Due to difficult drilling conditions, wells could not be built in a few of the hollow stem auger borings and were installed by STRADEX method, an eccentric, simultaneous casing advancement method using air rotary drilling. Wells TW-3A, TW-4, and TW-4A were drilled using this method by offsetting several feet from the hollow stem auger boring. Each of these wells were constructed as fully penetrating two-inch diameter observation wells in the confined sand and gravel unit. Static groundwater levels in wells on the site are near or at ground surface. Well logs for each well are presented in Appendix C-2.

Geologic and well construction data collected during the initial exploratory phase of the project was used to construct a north-south oriented stratigraphic cross section of the site shown as Plate 2. Geologic data collected during subsequent drilling was added to better define the bedrock surface and

show the test well screen positions. The cross section shows that the bedrock surface beneath the site is approximately 52 feet below grade at TW-1 and dips toward the south to a depth of 241 feet at TW-6. Bedrock is covered by a lodgement till layer that thickens toward the south. Overlying the till is the primary aquifer of the site, a sand and gravel unit that varies in thickness and composition. Generally, the sand and gravel unit is thinnest in the northern part of the site and becomes thicker and occurs slightly deeper in the southern half of the site. Overlying the sand and gravel unit is a fine sand and silt unit with some clay, laminated in places, that extends to ground surface across the site. Occasional sandy and thin gravelly zones occur in the upper portion of this unit. A relatively thin alluvial/wetland deposit covers much of the low-lying areas of the site. Two prominent hills composed of brown sand and gravel occur on the site at both the TW-3 well cluster and at the TW-4AD well cluster. These upland areas have an elevation of approximately 15-20 feet higher than the surrounding wetland plain, the southernmost having been quarried for sand and gravel in years past. This quarrying operation has removed most of the center and southern portion of the mound to an elevation nearly level with the surrounding wetland plain. A third elevated area occurs as a thin ridge in the western part of the site, west of the TW-3S and TW-3D well pair, and is not shown on the cross section.

3 TEST WELL CONSTRUCTION AND PRELIMINARY TESTING

A second phase of test well drilling and construction began in October 2002 after the sieve grain size analyses conducted on the samples collected from each of the preliminary test wells were completed. The results of the grain size analyses were used to design screens for four proposed sand and gravel test wells. Two bedrock test well sites, TW-5 and TW-6, were also selected to assess the bedrock aquifer beneath the site. Once the test wells were completed, preliminary well yield and water quality testing was completed on each well to get an early indication of the character of each well. In addition, four supplemental observation wells were constructed to provide additional water level data for subsequent aquifer testing. Well logs for each of the second phase test wells and observation wells are contained in Appendix C-2.

3.1 Test Well Construction

Test wells drilled and constructed on the Route 376 Properties consisted of both sand and gravel wells and bedrock wells. The installation of each of these well types is discussed in the following sections. Well logs for each test well are contained in Appendix C-2.

3.1.1 Sand and Gravel Wells

Sand and gravel well construction began using the STRADEX method at several locations, but was replaced by the percussion drilling (cable tool) method after heaving sand and gravel complicated the installation of telescoping screens through the STRADEX casing shoe. Test wells TW-2A and TW-3AS were successfully installed using the STRADEX method. Test well TW-2A was installed by advancing the casing to a depth of three feet below the target screen depth and cutting off the drive shoe before installing the telescoping screen assembly. The telescoping screen assembly consisted of from top to bottom of a two foot blank section with a six-inch diameter Neoprene figure-K packer, a three foot long, five-inch diameter, stainless steel, 100-slot continuous wire-wrapped screen, followed by a three foot long, five-inch diameter stainless steel sump. The screen interval for TW-2A was 59 feet to 62 feet, centered in a sand and gravel layer located between 56 feet and 64 feet below grade. Once the screen assembly was in-place, the casing was pulled back to expose the screen interval and allow for a natural pack to form around the screen.

TW-3AS was installed in a similar manner with the casing advanced below the target depth and the casing shoe cut off to allow easy installation of the telescoping screen assembly. A six-inch 140-slot screen with an eight-inch figure-K packer was installed in this well. The screen section, measuring 10 feet in length was installed in the upper portion of the sand and gravel aquifer between 67.5 feet and 77.5 feet below grade.

Test well TW-3 was installed by cable tool method in the former location of TW-3A located in the central portion of the site. Eight-inch casing was advanced several feet below the base of the sand and gravel unit and pulled back to expose a six-inch diameter telescoping screen assembly with an eight-inch diameter K-packer, fifteen feet of 30-slot screen, and a five foot sump. The screen was installed in the lowest fifteen feet of the sand and gravel aquifer.

Test wells TW-4AD and TW-4AS were installed approximately ten and fifteen feet north of TW-4A, respectively, and located in the southern portion of the property. TW-3AS was installed by cable tool method in eight-inch diameter casing in the upper portion of the sand and gravel aquifer. The six-inch 100-slot screen was set between 86 feet and 100 feet below grade. TW-4AD was installed by cable tool method at the base of the lower half of the aquifer. The five-inch diameter 60-slot screen interval was set between 107 feet and 118 feet below grade.

Each of the sand and gravel test wells were developed after installation to clear the screens and grade the natural sand and gravel pack around the screens. Most of the wells were developed by a combination of bailing and sand pumping, followed by water jetting. TW-3AS was developed using a combination of methods including an air line lift pump, surge block, followed by bailing and sand pumping. Test well TW-2A was developed with an air line lift pump and submersible pump.

3.1.2 Bedrock Wells

Test well drilling and construction began with 10-inch diameter STRADEX drilling at TW-6, a bedrock test well located 45 feet north of existing TW-4A in a former sand and gravel borrow pit. Ten-inch drilling encountered dolostone bedrock at 241 feet below grade and advanced to a total depth of 283 feet below grade. Nine-inch diameter drilling continued to 290 feet where six-inch diameter steel casing with a driveshoe was set and sealed with bentonite chips in the ten-by-six annulus. Drilling

continued to a total depth of 321 feet by conventional six-inch diameter air rotary method and encountered several weathered high-yield water-bearing zones containing large amounts of heaving sand. Drilling was terminated after the borehole could not be advanced and kept open to its total depth.

Test drilling activities continued at location TW-5 (now TW-5A) in the same manner as TW-6. Ten-inch diameter steel casing was advanced by STRADEX method to 156 feet where weathered bedrock was first encountered. Ten-inch drilling continued to 215 feet where more competent rock was found. Nine-inch drilling advanced to 241 feet where eight-inch diameter steel casing was installed with a drive shoe. Eight -inch conventional air rotary drilling continued to a total depth of 320 feet where drilling ceased due to excessive sand and silt laden water. Blown yield exceeded 400 gallons per minute (gpm). After backfilling the open borehole to 221 feet with bentonite chips to temporarily seal off the high volume of water and sand, an attempt was made to pull the casing to facilitate reaming the ten-inch borehole to a larger diameter to allow the installation of larger diameter casing and provide the necessary annular space for additional telescoping casing sizes. During the procedure, the ten-inch casing became sand locked in the formation after being pulled back seven feet. Construction activities at this well ceased and the well was renamed TW-5A.

A second attempt was made at the TW-5 location after TW-5A was terminated. Drilling began at an offset located approximately ten feet north of TW-5A with twelve-inch diameter concentrics drilling, another eccentric, simultaneous casing advancement drilling method. Twelve-inch casing was advanced to a depth of 195 feet below grade. Difficult drilling conditions required the use of mud rotary drilling below 195 feet. A ten-inch diameter mud rotary borehole was advanced through highly fractured and weathered dolostone to a depth of 391 feet where eight-inch diameter steel casing was set in competent bedrock and sealed with bentonite chips and bentonite grout to the surface. Seven-inch diameter conventional air rotary drilling continued below the casing to a total depth of 403 feet after encountering a 1.5 foot thick water-bearing zone at 397 feet that yielded more than 400 gpm. The well was air developed for two and a half days to attempt to clean out the primary water-bearing zone as much as possible by this method.

3.1.3 Observation Wells

Several additional observation wells were installed during and following the installation of the test wells. Two observation wells were drilled in February 2003 near TW-3 to monitor both the confined sand and gravel unit and the shallow surficial deposits. OW-2 was drilled east of TW-3 by STRADEX method to a depth of 60 feet below grade and constructed as a two-inch diameter PVC well with fifteen feet of screen. This well was installed to monitor water levels in the confined sand and gravel unit. OW-1 was installed west of TW-3 near Gayhead Creek and adjacent to the TW-3S and TW-3D well pair. This well was drilled to fourteen feet and constructed as a shallow two-inch PVC well with four feet of screen to monitor a shallow sand and gravel layer and to provide data that could indicate if pumping in TW-3 may influence water levels in Gayhead Creek.

Two additional observation wells were installed near TW-4AD in May 2003 to provide distance drawdown data for pumping tests conducted in TW-4AD. Well OW-3 was drilled approximately 37 feet south of TW-4AD to a depth of 120 feet where 15 feet of two-inch PVC screen was set at the base of the confined sand and gravel unit. Well OW-4 was drilled and constructed in the same manner approximately 245 feet south of TW-4AD.

In addition to these two-inch observation wells, five shallow well points were installed on the site near test wells TW-2A and TW-3 to determine if pumping influenced water levels in the surrounding wetlands. One 1.25-inch diameter galvanized steel well point screen was installed approximately 100 feet north of TW-3 in a hand auger boring to a depth of eight feet below grade. A five foot long screen was set in a fine sand filter pack that was sealed at the surface with bentonite chips. Four such well points were installed in an east-west oriented line at TW-2A. Two 1.25-inch diameter well points were installed at a distance of 50 feet and 100 feet from TW-2A in both directions.

3.2 Preliminary Testing

Preliminary yield tests were performed each of the five viable test wells to get an early indication of the yield potential and clarity of each well. TW-6 was not tested because of the heaving sand problem experienced during drilling. Well TW-2A was tested during development using both an air line pump and a submersible pump. Preliminary testing indicated that the well could produce more than 70 gpm

with minimal drawdown. TW-3AS was pumped with an air line and, after initially yielded about 8 gpm, produced more than 50 gpm as the well screen was developed, however the well continued to produce considerable amounts of silt and sand. TW-4AS was pumped with an airline after being bail tested with the cable tool rig and was found to yield about 5 gpm. Early bail tests of TW-4AD indicated that the well yielded poorly, but improved significantly after the well was developed by water jetting. TW-3 bail testing indicated the well could yield approximately 50 gpm after the well was water jetted.

Preliminary step-drawdown tests were performed on wells TW-3, TW-4AD, and TW-5, three of the four test wells that showed the most potential as water supply test wells. These wells were tested to provide early data of both the yield and turbidity levels in each well. Each well was pumped in a step-wise fashion beginning with a constant-rate of fifteen to twenty gallons per minute and ending with a rate of 70 gpm to 75 gpm, the maximum rate of the pump. Wells TW-3 and TW-4AD both performed well and turbidity levels improved significantly early in the tests. Maximum drawdown at the end of the tests were less than 20 feet and less than 15 feet, respectively. Maximum drawdown in TW-5 was less than five feet during the test, but turbidity was poor throughout the test, improving only slightly as the test continued.

Preliminary water quality tests were also collected from each of the onsite test wells at the end of well development and sent to a laboratory for analysis. The results of these preliminary analyses are presented in Appendix C-2.

4 AQUIFER TESTING

Aquifer tests were performed on three of the five sand and gravel wells that the preliminary yield tests suggested would produce at the highest rates. Aquifer tests were performed on TW-2A, TW-3, and TW-4AD in May and early June 2003. The tests included a step-drawdown test and a 72-hour constant-rate test for each well. An additional constant-rate test was conducted on TW-3 and TW-4AD. Summary descriptions of the tests and results of the analysis are described in the following sections.

4.1 Monitoring Locations

Wells monitored during the aquifer tests for each pumping well included the pumping well itself, adjacent onsite test wells and observation wells, and select offsite domestic and commercial water supply wells. Each well was monitored using automated dataloggers to collect continuous water level measurements before, during , and after each pumping test. Stream level measurements were also collected using staff gages installed at four locations in Gayhead Creek.

4.1.1 Step-Drawdown Pumping Tests

This section contains a discussion of the step-drawdown tests conducted on the primary test wells TW-2A, TW-3, and TW-4AD in May 2003. Field procedures are discussed and followed by analysis of the data. Data from these tests are presented in Appendix C-2.

4.1.1.1 TW-3 Step-Drawdown Tests

TW-3 step-drawdown testing began at 10:00 AM on May 5, 2003 at a pumping rate of 50 gpm. Water level measurements were collected with a datalogger at one minute intervals throughout the test and manual measurements were collected for verification. After 60 minutes of pumping, the pumping rate was stepped up to the next rate. A total of four steps were performed at rates of 50 gpm, 100 gpm, 125 gpm, and 95 gpm. The first two rates were 60 minutes in duration, but due to a rapid decrease in available drawdown, the 125 gpm step ended after 5 minutes and the rate lowered to 95 gpm. This final step continued for a period of 60 minutes before the test was stopped.

A second step-drawdown test was performed after the well was permitted to recover for a period of 130 minutes. Three 60-minute steps were conducted at rates of 50 gpm, 70 gpm, and 90 gpm based on the

observations made during the first test that suggested the sustainable rate for this well would be approximately 70 gpm. Extrapolation of the data from the second test suggested the sustainable rate for the constant-rate test would be about 70 gpm with 56.8 feet of available drawdown. The constant-rate test that followed was aborted after 19 hours of pumping due to a loss of available drawdown. The pump setting depth was believed to be too low, possibly obstructing the top of the screen assembly, and was raised five feet to eliminate this possibility.

A third step-drawdown test was performed with the new pump setting on May 7, 2003. Three 60-minute steps were performed at rates of 50 gpm, 70 gpm, and 90 gpm without pump cessation. As before water level measurements were collected automatically by datalogger and manually for verification. Flow rate was controlled by a valve and measured using a flow meter and watch at the wellhead. Total available drawdown for the test was 52.55 feet.

The data collected from the third step-drawdown test was plotted as time versus drawdown as shown in Appendix C-2 to determine the change in drawdown for each step and select a sustainable pumping rate for the constant-rate test. This was done by extrapolating a straight line fitted to the end of each step to the 72-hour time line on the plot. This extrapolation assumes that no positive or negative recharge boundaries are encountered during the test. Based on the data from this test, a sustainable rate of 60 gpm would be possible without drawing down to the pump level, but a conservative rate of 50 gpm was selected to guarantee the completion of a 72-hour pumping test in the event a negative hydraulic boundary is encountered.

The step drawdown data was used to calculate the specific capacity of test well TW-3 which is plotted versus the corresponding discharge rate as shown in Appendix C-2. The total drawdown at the end of each step was used to calculate the specific capacity for each pumping rate. A straight line was fitted to the data and can be used to estimate the specific capacity at various rates and indicates the rate of decrease in the specific capacity as pumping rate increases. The specific capacity for pumping at 50 gpm in this well is about 2.35 gpm per foot of drawdown.

The step-drawdown data was also used to estimate the specific drawdown and well loss coefficients for test well TW-3. The Hantush-Bierschenk method was used to determine the well loss coefficients

using the change in drawdown from the previous step at a point 60 minutes into each step. Specific drawdown values were plotted for different pumping rates and plotted versus discharge rate as shown in Appendix C-2. A straight line was fitted to the data to determine the y-axis intercept value, which is the linear, aquifer-loss coefficient (B), and the slope of the line which is the non-linear, well-loss coefficient (C). These two coefficients are incorporated in the specific drawdown formula shown on the specific drawdown plot and are used to determine the drawdown for a specific pumping rate and the estimate the amount of drawdown specifically resulting from the turbulent loss in the well and the surrounding aquifer. The data indicates that 60 percent of the drawdown is due to aquifer losses while 40 percent is a result of turbulent losses in well.

4.1.1.2 TW-2A Step-Drawdown Test

The TW-2A step-drawdown was performed on May 8, 2003 with a total available drawdown of 49.5 feet and a static water level of 4.2 feet below casing rim. A total of five 60-minute steps were performed at rates of 50 gpm, 75 gpm, 100 gpm, 125 gpm, and 145 gpm. Measurements were collected by datalogger and flow was controlled manually and measured with a watch and meter. Depth to water at the end of the test measured approximately 18.5 feet below casing rim, resulting in 35 feet of remaining available drawdown.

The step-drawdown test data was plotted as time versus drawdown and indicated that the well could sustain a high pumping rate for the entire 72-hour test period, probably at a rate higher than the highest rate pumped during the step-drawdown test. A rate of 100 gpm was selected for the 72-hour constant-rate test because that rate corresponds to the rate required to meet the daily demands of the Shenandoah community. Also, because TW-2A is located in the wetlands, potential for pumping to influence the wetlands existed if the pumping rate was too high. Therefore, a pumping rate that would meet the minimum requirements of the project was selected. A specific capacity of 13 gpm/ft and a specific drawdown of 8.17 feet was calculated from the data. Well loss data is presented on the specific drawdown plot and presented in Appendix C-2 along with the specific capacity plot and the time versus drawdown plot for the step-drawdown test.

4.1.1.3 TW-4AD Step-Drawdown Test

The TW-4AD step-drawdown test occurred on May 19, 2003 with five 60-minute steps performed at the rates of 50 gpm, 75 gpm, 100 gpm, 125 gpm, and 150 gpm. Total available drawdown at the beginning of the test measured 91.7 feet with a static water level of 8.46 feet below casing rim. As with the other step-drawdown tests, water level data was collected with a datalogger and flow rates were controlled manually and measured with a watch and meter. Total drawdown at the end of the test measured 43.28 feet, with more than 48 feet of available drawdown remaining in the well. The time versus drawdown plot is contained in Appendix C-2.

A pumping rate of 100 gpm was selected for the 72-hour pumping test for test well TW-4AD for the same reasons as those stated earlier for TW-2A. Extrapolation of the 100 gpm step suggested that the total drawdown after 72-hours of pumping would be approximately 28 feet assuming no positive or negative boundaries are encountered. The time-drawdown data was used to generate a specific capacity plot and calculate a specific capacity of 3.86 gpm per foot of drawdown for a pumping rate of 100 gpm. Specific drawdown data was calculated from each step and well losses were calculated and are presented along with the plotted specific drawdown data in Appendix C-2. The well loss calculations indicate that 72.5 percent of the drawdown is a result of formation losses, while 27.5 percent was a result of turbulence losses in the well.

4.1.2 Constant-Rate Pumping Tests

Constant-rate pumping tests were conducted on each of the three primary test wells to determine the behavior of the well and aquifer would support water supply production pumping. The following sections discuss the procedures and summarize the results of the analysis performed on the data for each well tested. Data plots discussed in the following sections are contained in Appendix C-2.

4.1.2.1 TW-3 72-Hour Constant-rate Test

The 72-hour test for TW-3 began at 11:00 on May 12, 2003 at a pumping rate of 50 gpm after the pump was lowered three feet to gain some additional available drawdown. The static water level in the well immediately prior to the start of the test was 17.95 feet below the well casing rim. Water level measurements were recorded every minute with a datalogger and manual measurements were made for

verification. Pumping rate and total gallons pumped were recorded periodically throughout the test. Water quality samples were collected every four hours from the well and the nearby stream at location SW-2 and tested for basic field parameters. A comprehensive water quality sample that included a microparticulate analysis sample were collected from the well near the end of the test and sent to a laboratory for analysis. Stream levels were measured at SW-2 and SW-3. After 72 hours, the test was terminated and recovery monitoring began for a period of several days in the pumping well and surrounding observation wells. Recovery water levels were recorded with a datalogger in each well. A total of 211,506 gallons were pumped over the three-day test period resulting in a calculated average pumping rate of 49 gpm.

Drawdown measurements were plotted versus time on a semi-log scale to produce a time-drawdown curve for the TW-3 constant-rate test. The time-drawdown curve shows a steady decline of the water level until approximately 150 minutes into the test when the slope of the curve decreases. At approximately 1500 minutes into the test, the curve becomes level at 30 feet of drawdown. Total drawdown at the end of the test was 30.21 feet. To calculate aquifer properties, a straight line was fitted to the mid-time portion of the curve to eliminate the influence of early-time borehole storage effects or late-time boundary effects. The Cooper-Jacob modified form of the Theis equation was used to calculate a transmissivity (T) value of 4.2×10^3 gallons per day per foot (gpd/ft). The transmissivity was used to calculate a hydraulic conductivity (K) value of 1.2×10^2 gpd/ft^2 with a aquifer thickness (b) value of 35 feet.

The transmissivity value calculated from the TW-3 time-drawdown curve is comparable to values calculated for transmissivity from the time-drawdown curves for nearby observation wells TW-3S and OW-2. Both of these wells are screened in the same unit as the pumping well. Storativity values were calculated using the observation well time-drawdown curves resulting in a 10^{-4} magnitude value for both wells. Water level plots for each observation well monitored during this test and time-drawdown plots for selected wells are presented in Appendix C-2.

The time-drawdown data from three nearby observation wells was used to generate distance-drawdown plots for the TW-3 constant-rate test. A distance-drawdown plot produced from 24-hour drawdown values was used to calculate the well efficiency for TW-3 by extrapolating a straight line fitted to the

distance-drawdown data back to the radius of the pumping well and dividing the intercept drawdown value by the actual drawdown measured in the well. This results in a well efficiency of 44 percent. A 72-hour distance-drawdown plot was also generated and used to determine the distance to the point of zero drawdown after pumping for 72-hours at 50 gpm. This plot was used to calculate transmissivity and hydraulic conductivity for comparison to the time-drawdown values.

The recovery data from TW-3 shows that the well recovers relatively quickly supporting the characterization of the sand and gravel aquifer as confined since confined aquifers respond more quickly to pumping stress changes. The recovery data was also analyzed to calculate transmissivity and hydraulic conductivity using the Theis Recovery method. Residual drawdown was plotted versus the ratio of time since pumping began to time since pumping ended (t/t') on a semi-log scale. A straight line fitted to the mid-time data results in a transmissivity of 2.3×10^3 gpd/ft and a hydraulic conductivity of 6.6×10^1 gpd/ft^2, values similar to the time-drawdown and distance-drawdown analysis values.

Four nearby offsite domestic supply wells were used as observation wells during this test. Two of the wells, the Dahlke well and the Hopewell Medical well are located east of TW-3. Both wells are drilled bedrock wells and did not respond to pumping during this test. The other two wells were located to the west of the pumping well along Van Vlack Road on properties contiguous to the project site. These wells were located on the Gerathy and O'Connor properties and only the Gerathy well showed a slight response to pumping, with about 0.02 feet of total drawdown.

The other two test wells that were scheduled to be pump tested, TW-2A and TW-4AD, did not drawdown during the TW-3 test. Several proximal onsite observation wells that were screened in the upper portion of the confining unit and in formations underlying the sand and gravel unit (till and bedrock) did show some response to pumping in TW-3. Two shallow wells, OW-1 and WP-3N, showed 0.92 feet and 0.95 feet of drawdown respectively. The drawdown curve for both wells had a similar steady slope for the first 1,000 minutes of the test, then the curve steepened for the remainder of the test. A similar pattern was observed in the nearby bedrock observation well TW-5, which displayed a change in the drawdown slope around 1,000 minutes. Well TW-3D, a well screened in a sandy zone in the underlying till unit, displayed a drawdown curve similar to the sand and gravel wells

with a slight increase in the slope of the curve around 800 minutes into the test. Influence of pumping in these wells suggest leakage from adjacent units.

The time-drawdown data for OW-2 was analyzed by the Hantush-Jacob method for leaky aquifers by AquiferTest pumping test software. The results of the analysis produced transmissivity, hydraulic conductivity, and storativity comparable to previously discussed results and showed that a slight leakage factor existed as the log-log plot deviated from the Theis nonequilibrium type curve in the early portion of the test then flattens out near the end of the test . This degree of deviation from the Theis curve suggests only a slight leakance from the confining layers and is supported by a relatively high hydraulic resistance value for the confining layer (c). This value was used to calculate a hydraulic conductivity of the confining layer (K') of 5.8×10^{-4} gpd/ft by dividing the confining layer thickness (b') by the hydraulic resistance. This indicates that the aquifer is characterized as a leaky confined aquifer. The Hantush-Jacob analysis is contained in Appendix C-2.

4.1.2.2 TW-2A 72-Hour Constant-Rate Test

The 72-hour test for TW-2A began at 10:01 on May 20, 2003 at a pumping rate of 100 gpm. The static water level in the well immediately prior to the start of the test was 4.74 feet below the well casing rim. As with the previous test, water level measurements were recorded every minute with a datalogger and manual measurements were made for verification. Pumping rate and total gallons pumped were recorded periodically throughout the test. Water quality samples were collected every four hours from the well and the nearby stream at location SW-1 and tested for basic field parameters. A comprehensive water quality sample that included a microparticulate analysis sample were collected from the well near the end of the test and sent to a laboratory for analysis. Stream levels were monitored at SW-1 and SW-2. The test ended after 72 hours of pumping and recovery monitoring began for a period of several days in the pumping well and surrounding observation wells with dataloggers. A total of 431,007 gallons were pumped over the 72-hour test period resulting in an average pumping rate of 99.8 gpm.

The time-drawdown curve for the TW-2A test indicates this well quickly drew down approximately eight feet and then quickly stabilized, with the water level declining at a steady rate until approximately 1,000 minutes into the test when the slope of the curve increased slightly. At approximately 3,000

minutes into the test, the curve becomes level at about 9.4 feet of drawdown to the end of the test. The Cooper-Jacob modified form of the Theis equation was used to calculate a transmissivity (T) value of 8.3×10^4 gpd/ft from a straight line fitted to the mid-time portion of the curve. The transmissivity was used to calculate a hydraulic conductivity (K) value of 1.0×10^4 gpd/ft^2 with a aquifer thickness (b) value of 8 feet. These values are similar to transmissivity and hydraulic conductivity values calculated from nearby observation wells TW-2 and TW-1. A storativity value of 3.6×10^{-4} was calculated from TW-1.

The distance-drawdown derived from the time-drawdown data of four nearby observation wells was plotted for a periods of 24 hours and 72 hours. The 24-hour drawdown plot was used to calculate a well efficiency of 54 percent for TW-2A. The 72-hour distance-drawdown plot indicates that the distance from the pumping well to the point of zero drawdown after pumping for 72-hours at 100 gpm is approximately 1200 feet.

Well TW-2A was also analyzed by the Hantush-Jacob method to assess the leakage from the fine sand and silt units above and below the thin sand and gravel aquifer. The results of the analysis suggests that a slight leakance factor exists based on the drawdown data from nearby TW-2. A hydraulic resistance value of 6.22×10^6 minutes was used to calculate a hydraulic conductivity of 9.7×10^{-2} gpd/ft^2 for the confining unit. One observation that can be taken from the Hantush-Jacob plot is that the water level begins to level out at a later time and does not level out completely, suggesting that the confining unit has some storage that is contributing to the sand and gravel aquifer. A confining layer with no storage would plot as a level line, parallel to the Hantush-Jacob curve lines.

The recovery data from TW-2A shows that the well recovers very quickly with most of the recovery occurring within the first minutes after pump shutdown. The recovery data was analyzed to calculate transmissivity and hydraulic conductivity using the Theis Recovery method. A straight line fitted to the straight segment of the time ratio versus residual drawdown curve results in a transmissivity of 1.7×10^5 gpd/ft and a hydraulic conductivity of 2.1×10^4 gpd/ft^2, values similar to the time-drawdown analysis values.

Drawdown was observed in a few offsite domestic supply wells located west of TW-2A. The Scharf

and Finney wells, located northwest of the test well, had a total drawdown at the end of the test of 0.60 feet and 0.25 feet respectively. The Diliddo well, located 787 feet west of the test well, is a shallow bedrock well that had a total drawdown of 0.13 feet, while the O'Connor well fell 0.34 feet during the test. The Gerathy well appeared to have a trace of drawdown (0.02 feet) at the end of the test that can be attributed to pumping in TW-2A. Only three onsite observation wells showed drawdown during the test. Adjacent TW-2 and TW-1 were the most notable with 2.45 feet and 0.5 feet of drawdown respectively. Approximately 0.11 feet of drawdown was apparent in TW-3S and 0.08 feet in OW-2. Drawdown in TW-3 from this test could not be determined as drawdown resulting in pumping in TW-4AD obscured any minor drawdown that may have resulted from pumping in TW-2A.

The four adjacent shallow wetland monitoring points did not show any pumping influence during the TW-2A pumping test. Changes in water level were observed with a step-like decrease about 0.15 feet each day, a pattern that occurred in the days before the test. This pattern was probably a result of evapotranspiration in the wetlands as water levels were flat in evening and morning hours, then dropping during the midday hours each day. This pattern was apparent through the test period and after the test ended except where rain events obscured the pattern. One light rain event that occurred nearly 24 hours after the test started caused water levels to rise quickly then recede gradually over the next day and a half to a level near pre-storm levels. No changes were apparent in the water level plots when pumping ceased. The largest water level change in the well points occurred several days after the test ended when a large rain event caused water levels to rise about 1.5 feet in each well point.

4.1.2.3 TW-4AD 72-Hour Constant-Rate Test #1

TW-4AD 72-hour constant-rate test number one began on May 20, 2003 at 13:40 at a pumping rate of 100 gpm. The static water level in the well immediately prior to the start of the test was 8.58 feet below the well casing rim. Water level measurements were recorded with a datalogger and manual measurements were made for verification. Pumping rate and total gallons pumped were recorded periodically throughout the test. Water quality samples were collected every four hours from the well and the nearby stream at location SW-3 and tested for basic field parameters. A comprehensive water quality sample that included a microparticulate analysis sample were collected from the well near the end of the test and sent to a laboratory for analysis. Stream levels were monitored at SW-3 and SW-4. The test ended after 72 hours of pumping and automated recovery monitoring began for a period of

several days. A total of 430,427 gallons were pumped over the 72-hour test period resulting in an average pumping rate of 99.6 gpm.

The time-drawdown curve for TW-4AD test #1 indicates that the water level in this well quickly steadily drew down approximately twenty-four feet and then leveled out for the remainder of the test after approximately 100 minutes of pumping. No negative hydraulic boundaries were encountered during the test. The Cooper-Jacob modified form of the Theis equation was used to calculate a transmissivity (T) value of 8.1×10^3 gpd/ft from a straight line fitted to the mid-time portion of the curve. The transmissivity was used to calculate a hydraulic conductivity (K) value of 5.4×10^2 gpd/ft^2 with a aquifer thickness (b) value of 15 feet. These values are similar to transmissivity and hydraulic conductivity values calculated from nearby observation wells OW-3 and OW-4. Storativity values of 8.2×10^{-4} and 2.5×10^{-4} was calculated respectively from each well.

The distance-drawdown derived from the time-drawdown data of three nearby observation wells was plotted for a periods of 24 hours and 72 hours of pumping. The 24-hour drawdown plot was used to calculate a well efficiency of 78 percent for TW-4AD. The 72-hour distance-drawdown plot indicates that the distance from the pumping well to the point of zero drawdown after pumping for 72-hours at 100 gpm is approximately 600 feet from the pumping well.

Well TW-4AD was analyzed by the Hantush-Jacob method to assess the leakage from the confining fine sand and silt unit above sand and gravel aquifer. The results of the analysis suggests that a slight leakance factor exists based on the drawdown data from nearby OW-3. A hydraulic resistance value of 5.88×10^7 minutes was used to calculate a hydraulic conductivity of 1.5×10^{-2} gpd/ft^2 for the confining unit.

The recovery data from TW-4AD shows that the well recovers very quickly with most of the recovery occurring within the first minutes after pump shutdown. The recovery data was analyzed to calculate transmissivity and hydraulic conductivity using the Theis Recovery method. A straight line fitted to the straight segment of the time ratio versus residual drawdown curve results in a transmissivity of 8.5×10^3 gpd/ft and a hydraulic conductivity of 5.7×10^2 gpd/ft^2, values similar to the time-drawdown analysis values.

Drawdown was most significant in the onsite observation wells that surround TW-4AD, decreasing with distance. Drawdown extended to the north to include the three wells monitored for this test in the TW-3 well cluster, amounting to approximately 0.5 feet in those wells. Some drawdown was also evident in several offsite observation wells. Quaglio Well #1 was most affected with 0.82 feet of drawdown, followed by Gerathy and Hickman with 0.20 feet and 0.10 feet respectively. A trace of drawdown was apparent in observation well 2421 located along Route 52. In addition, the shallow hand dug Quaglio well #2 drew down 0.25 feet during the test and remained at that level after the test indicating that some vertical influence exists and that the well does not recharge very quickly. Bedrock well TW-6 also was influenced by pumping in TW-4AD with 0.6 feet of drawdown at the end of the test. No drawdown was detected in the Dahlke well along Route 376. Water level graphs for each observation well are contained in Appendix C-2 along with time-drawdown curves of selected wells.

4.1.2.4 TW-4AD 72-Hour Constant-Rate Test #2

A second constant-rate test was conducted on test well TW-4AD beginning on June 3, 2003 to assess the potential influence of pumping in TW-4AD on a gasoline UST site with a documented tank leak that has produced a MTBE plume in the bedrock aquifer near the southern boundary of the project site. The service station is located along Route 52 approximately 1,500 feet south of TW-4AD. Permission to access the gasoline station monitoring wells was not received from the owner and the consultant that monitors the site until after the initial TW-4AD pumping test was completed.

TW-4AD 72-hour constant-rate test #2 began on June 3, 2003 at 8:45 at a pumping rate of 100 gpm. The static water level in the well immediately prior to the start of the test was 7.97 feet below the well casing rim. As before, water level measurements were recorded with a datalogger and manual measurements were made for verification. Pumping rate and total gallons pumped were recorded periodically throughout the test. Stream level measurements were recorded every four hours from the staff gage in the nearby stream at location SW-3 and at SW-4 located upstream of the well to monitor potential pumping influence on Gayhead Creek. Water quality testing was not performed on the well or the stream during this test. The test ended after 72 hours of pumping and automated recovery monitoring began for a period of several days. A total of 431,655 gallons were pumped over the 72-hour test period resulting in an average pumping rate of 99.9 gpm.

The time-drawdown curve for TW-4AD test #2 indicates that the water level in this well quickly drew down approximately twenty-six feet and then leveled out for the remainder of the test after approximately 100 minutes of pumping. No negative hydraulic boundaries were encountered during the test. A 24-hour specific capacity of 3.72 gpm/ft was calculated from the time-drawdown data. The Cooper-Jacob modified form of the Theis equation was used to calculate a transmissivity (T) value of 1.0×10^4 gpd/ft from a straight line fitted to the mid-time portion of the curve. The transmissivity was used to calculate a hydraulic conductivity (K) value of 6.6×10^2 gpd/ft^2 with a aquifer thickness (b) value of 15 feet. These values are similar to transmissivity and hydraulic conductivity value calculated from the time-drawdown curve of nearby observation well OW-4. A storativity value of 2.3×10^{-4} was calculated respectively from that observation well.

The distance-drawdown derived from the time-drawdown data of three nearby observation wells was plotted for a period of 72 hours of pumping. The 72-hour distance-drawdown plot indicates that the distance from the pumping well to the point of zero drawdown after pumping for 72-hours at 100 gpm is approximately 525 feet from the pumping well. A transmissivity of 9.6×10^3 gpd/ft and a hydraulic conductivity of 6.4×10^2 gpd/ft^2 were calculated from the distance-drawdown curve as well. This figure shows a drawdown configuration very similar to the drawdown configuration of the first TW-4AD test.

The recovery data from the second TW-4AD test shows that the well recovers very quickly with most of the recovery occurring within the first minutes of recovery. The recovery curve extrapolated back to the zero drawdown line intersects the line near zero at a time ratio value of one indicating the recovery curve is not influenced by excessive or insufficient recharge, or by a high variability in the storage coefficient of the aquifer. The recovery data was analyzed to calculate transmissivity and hydraulic conductivity using the Theis Recovery method. A straight line fitted to the middle section of the time ratio versus residual drawdown curve results in a transmissivity of 1.7×10^5 gpd/ft and a hydraulic conductivity of 2.1×10^4 gpd/ft^2, values similar to the time-drawdown analysis values.

In addition to characterizing the aquifer beneath the site, an assessment was made with data collected from the second TW-4AD pumping test to determine if pumping in TW-4AD influences the observation well on the Mobil gas station site or those nearby that are within or near the contamination plume.

Mobil monitoring well 6, located on the northern edge of the gas station site, was monitored with a datalogger during the pumping test. This well has been reported to contain some of the highest concentrations of gasoline components of the wells on the gas station site. Data from the test indicated that this well was not influenced by pumping in well TW-4AD as water levels rose during the entire test period, a trend that started before the test began and continued after the test was completed. The Jake's Tex Mex well, located north of the gas station site, has historically contained gasoline contamination components and was also monitored continuously before, during, and after the pumping test. This well also did not respond to pumping in TW-4AD and like the Mobil MW-6 well, is believed to be a bedrock well. Well 1521 appeared to drawdown slightly during the test, with a total drawdown at the end of the test of 0.17 feet after removing the effects of a rain event that caused water levels to rise in a number of observation wells in the second half of the test. This drawdown value is similar to the amount of drawdown observed in the Hickman well located to the north, suggesting it is completed in the sand and gravel or in weathered bedrock that is hydraulically connected to the sand and gravel unit.

4.1.2.5 Surface Water Influence Assessment

The potential for pumping in each of the test wells influencing water levels in nearby Gayhead Creek and the surrounding wetlands was assessed by monitoring stream levels and shallow well points in adjacent wetlands during the pumping test, monitoring water quality in the stream near the pumping well and the pumping well itself, and collecting a microparticulate analysis (MPA) sample from each well near the end of each pumping test. The effects of pumping on the wetland well points were discussed in the appropriate sections for the constant-rate tests. The following sections discuss the stream level monitoring, field water quality testing activities, and the MPA testing results.

4.1.2.5.1 Stream Gaging

Water levels in Gayhead Creek were measured during each of the pumping tests to determine if pumping from the semi-confined sand and gravel aquifer induced recharge from the stream channel. Measurements where collected in the stream at a point immediately adjacent to the pumping well and from a point upstream of the pumping well for each pumping test conducted. Measurements were recorded every four hours during each pumping test with the first reading taken at the start of the test. Measurements were taken from a staff gage at each stream monitoring location graduated in hundredths

of a foot. Each staff gage was installed in a location in the stream channel that would guarantee that stream levels would not fall below or rise over the top of the gage. Care was also taken to position the gage in a calm section of the stream and near the bank to permit accurate readings of the gage. Measurements were recorded on a field sheet along with the time of the measurement. Stream gage data is tabulated and contained in Appendix C-2 along with plots of the data of each gage pair monitored during each pumping test.

The stream water level plots indicate that stream levels were not influenced by pumping in any of the tested wells. Stream gages for each test followed a pattern nearly identical to the other gage in the pair. During the TW-3 test both gages steadily declined as the stream receded over the entire test period, a period in which there were no storm events. A small storm event occurred during the TW-2A caused stream levels to rise slightly, but levels in at both gages varied less than 0.1 foot and mirrored each other. Levels during the first TW-4AD test were also consistent at both locations. The most dramatic changes occurred during the second TW-4AD test and a second test conducted at TW-3 to collect a second MPA sample as both tests were conducted at the same time. A significant storm events caused stream levels to rise slightly during the early morning hours of June 4th and then rising quickly to peak flow levels during the late morning of June 5th then receded during the remaining test period. Data for each gage pair for each test plotted in an identical pattern for the duration of each test.

4.1.2.5.2 Field Water Quality Testing

Water quality samples were collected from the pumping well and the nearby stream sampling location that corresponded with the stream gage location. The samples were collected to determine if at any time during the test that water from the stream was drawn into the well by comparing a few basic field parameters that included temperature, conductivity, pH, and turbidity. Sudden changes in the levels of one or more parameter may indicate an influence of pumping on the nearby stream. Field water quality data is presented in a table for each sampling location monitored for each test and contained in Appendix C-2. Graphs of each parameter are also contained in Appendix C-2 with well and stream results for each test paired for comparison.

The graphs show that field parameter results from each pumping test were generally more variable in the stream sample and more consistent and stable in the pumping well, as would be expected.

Temperature was higher in stream samples than well samples, typically a few degrees higher. Results for pH were higher in the stream samples than the well samples, varying slightly during the tests. The most apparent change in the pH levels occurred during TW-4AD test #1, when pH levels in both the well and the stream dipped 0.8 to 1.0 pH units. This is probably due to instrument or technician error as readings returned to normal levels for the remainder of the test.

Conductivity readings were generally higher in the stream than in the well for each pair, with the exception for the TW-2A test where conductivity in the well was about fifty percent higher than in the stream. Conductivity for the second TW-3 test, that was conducted to collect a second MPA test, was the most variable of all the tests with readings being nearly the same for the well and the stream. Conductivity in the stream starts and ends the test at a level below the well, but rises slightly during the test and is higher during some readings that the well. This is probably a result of the rain event that occurred during the latter portion of this test. Comparing the stream conductivity levels of the first TW-3 test to the second TW-3 test reveals that stream conductivity levels decreased from the first test conducted in early May to the second test in early June, bringing conductivity levels in the stream to levels similar to those seen in the test well. Conductivity levels in the test well were similar for both tests consistently measuring between 620 micro siemens (uS) and 650 uS.

Turbidity levels in each of the tests were generally stable with well readings being lower than stream readings. Turbidity in the stream during the second TW-3 test rose at the end of the test, coinciding with the storm event that occurred around that time that caused flow in the stream to increase. Turbidity levels were typically below 5 NTUs with readings in the wells decreasing slightly during the testing periods.

4.1.2.5.3 MPA Analysis

Four MPA samples were collected from the three pumped test wells. A second MPA sample was collected from TW-3 to verify the results of the first and allow for comparison with the samples from the other two test wells. The results of the MPA samples collected from the test wells are tabulated along with the comprehensive new source sample results for each well in Appendix C-2. The MPA sample is collected by passing 500-1,000 gallons at a rate of one to two gallons per minute through a fiber sediment filter contained in a housing and attached to a sample port at the wellhead. The sample

is collected later in the pumping test (>48 hours) to collect potential microparticles in the groundwater that would indicate the infiltration of surface water into the well, microparticles that would only be found in surface water under normal conditions. The water was collected and sent to Seewald Laboratories in Williamsport, Pennsylvania, a laboratory specializing in this type of analysis. The parameter list for this analysis included: diatoms, algae, insect parts, crustacean parts, rotifers, plant debris, coccidian oocysts, and Giardia.

The MPA analytical results indicated that all parameters were absent in each of the MPA samples collected. These results indicate that TW-2A, TW-3, and TW-4AD are not under the influence of surface water after pumping for a period of more than 48 hours.

4.1.2.6 Groundwater Quality Testing

Comprehensive new source samples were collected from each well near the end of each pumping test along with the MPA sample discussed above. The test parameters for each of the samples included pesticides, herbicides, volatile organic compounds, synthetic organics, metals, bacteria, radionuclides, and several general water quality characteristics.

The results of each sample indicate the groundwater quality in each well is good. Results for volatile organic compounds and pesticides/herbicides were generally below detection levels except for a few small detections of methylene chloride and bis (2-ethylhexyl) phthalate which may be due to laboratory cross-contamination. A few metals were detected above the detection limit in each of the samples including barium, chromium, sodium, and zinc. Manganese was detected in TW-3 and TW-4AD only. Radon was low in all three samples with the result for TW-2A being about three times higher at 600 picocuries per liter (pC/l) than the levels detected in TW-3 and TW-4AD. Bacteria was absent in all three test wells and nitrate was detected only in TW-2A at 4.25 mg/l, well below the standard of 10 mg/l. The most noteworthy results were the very high levels of sodium in each of the three samples. Sodium in TW-2A was the highest at more than 90,000 micrograms per liter (ug/l), while sodium concentrations in TW-3 and TW-4AD were over 8,000 ug/l and over 5,200 ug/l respectively. These high sodium levels are probably a result of runoff from melting snow containing road salt that flows onto and collects on this site each year in the spring.

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: OW-1

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.10.0203*
LOGGED BY: *E. Stoner*
DATES DRILLED: *2/12/03*

DRILLING INFORMATION

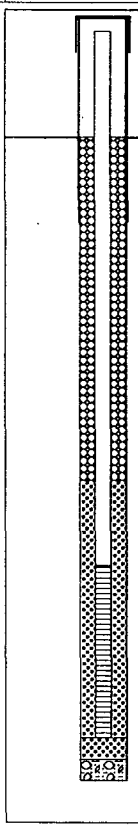
DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *C. Brenneman*
RIG TYPE: *Schramm*
DRILLING METHOD: *Air Rotary*
DEVELOPMENT DATE: ---
LOCATION: *Approx. 10 ft W. of TW-3S, near Gayhead Creek*

NOTES: Soil description supplemented from TW-3S & 3D logs
SWL on 2/12/03 = 4.38 ft below TOC
Ground surface elevation: 250.51 ft amsl

CASING RIM ELEVATION: 252.09 ft amsl
NORTHING: 994,006.491 EASTING: 684,058.936

DEPTH FEET	CUM. BLOWS YIELD	SAMP. #	LITHOLOGY
			SILT: gravel and geofabric top 1 ft, then olive gray silt, w/ vf-f sand, tr m-vc, tr. f SR-R gravel, organic, moist
			SAND & GRAVEL: olive gray, m-c w/ vc and vf-f, some silt, f SR-R gravel throughout, organic silt at top, cohesive to loose, wet
			SAND & GRAVEL: as above w/ more gravel
			SILTY SAND: layered vf-f w/ silt, laminations of f-m, some c-vc, cohesive to loose
			SAND & SILT: laminated, tr clay, sl plastic, cohesive

GRAPHIC



WELL CONSTRUCTION

WELL CONSTRUCTION DETAILS

- 6" dia. steel standpipe w/ locking cap
- 6" dia. air rotary borehole, 0 ft to 15 ft
- Bentonite chip annular seal, 0 ft to 10 ft
- 2" dia. sch. 40 PVC riser pipe, +2.5 ft to 10 ft
- #0 grade sand, 8 ft to 14.5 ft
- 2" dia. 10-slot PVC screen, 10 ft to 14 ft
- 2" bottom cap
- Collapsed formation, 14.5 ft to 15 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: OW-2

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.10.0203*
LOGGED BY: *E. Stoner*
DATES DRILLED: *2/12/03*

DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *C. Brenneman*
RIG TYPE: *Schramm*
DRILLING METHOD: *Air Rotary*
DEVELOPMENT DATE: —
LOCATION: *East end of upland in central portion of site*

NOTES: SWL on 2/20/03 = 4.85 ft below TOC
Ground surface elevation: 251.57 ft amsl

CASING RIM ELEVATION: 253.72 ft amsl
NORTHING: 993,908.069 EASTING: 684,426.360

DEPTH FEET	CUM. BLOWS YIELD	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
0			SAND & GRAVEL: dark yellowish brown, f-m, moist		0		6" dia. steel standpipe w/ locking cap
10			SAND & SILT: olive gray (5 Y 4/1) to med. dark gray (N4), vf-f, tr. clay, wet		10		6" dia. borehole, 0 ft to 62 ft
20					20		Bentonite slurry annular seal, 0 ft to 37.5 ft
30					30		2" dia. sch. 40 PVC riser pipe, +2.5 ft to 45 ft
40			SAND & GRAVEL: m-vc sand, f-m gravel of various lithologies, silty 58 ft to 62 ft, some vf-f sand 57 ft to 62 ft		40		Bentonite pellet annular seal, 37.5 ft to 42 ft
50					50		2" dia. 10-slot PVC screen, 45 ft to 60 ft #0 grade sand, 42 ft to 62 ft
60					60		2" bottom cap

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: OW-3

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.10.0203*
LOGGED BY: *K. Tamulonis*
DATES DRILLED: *5/15/03 - 5/16/03*

DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *K. Knaub*
RIG TYPE: *IR T-4W*
DRILLING METHOD: *Air Rotary*
DEVELOPMENT DATE: ---
LOCATION: *Approx. 50 ft SW of TW-4AD*

NOTES: SWL on 5/19/03 = 7.63 ft below TOC
Ground surface elevation: 253.51 ft amsl
See TW-4A log for soil description details

CASING RIM ELEVATION: 256.30 ft amsl
NORTHING: 992,973 EASTING: 684,059

DEPTH FEET	CUM BLOWN YIELD	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
0			SAND & GRAVEL		0		6" dia. steel standpipe w/ locking cap, +3 ft to 97 ft
			SAND & SILT				
10					10		
20					20		Bentonite slurry annular seal, 0 ft to 97 ft
30					30		
40					40		
50					50		2" dia. sch. 40 PVC riser pipe, +2.5 ft to 105 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: OW-3

DEPTH FEET	BLOWN YIELD (GPM)	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
60					60		6" dia. steel standpipe w/ locking cap, +3 ft to 97 ft
70					70		Bentonite slurry annular seal, 0 ft to 97 ft
80			SILT, SAND & GRAVEL		80		2" dia. sch. 40 PVC riser pipe, +2.5 ft to 105 ft
			SAND & GRAVEL				
90					90		6" dia. borehole, 0 ft to 120 ft
100			SAND		100		Bentonite chip annular seal, 97 ft to 102 ft
			SAND & GRAVEL				
110					110		#0 grade sand, 102 ft to 120 ft
							2" dia. 10-slot PVC screen, 105 ft to 120 ft
120			SILT, SAND & GRAVEL		120		2" bottom cap

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: OW-4

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.10.0203*
LOGGED BY: *K. Tamulonis*
DATES DRILLED: *5/15/03 - 5/16/03*

DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *K. Knaub*
RIG TYPE: *IR T-4W*
DRILLING METHOD: *Air Rotary*
DEVELOPMENT DATE: ---
LOCATION: *Approx. 250 ft SW of TW-4AD*

NOTES: SWL on 5/19/03 = 5.90 ft below TOC
Ground surface elevation: 251.44 ft amsl
See TW-4A log for soil description details

CASING RIM ELEVATION: 253.74 ft amsl
NORTHING: 992,813 EASTING: 683,936

DEPTH FEET	CUM. BLOWN YIELD	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
0			SAND & GRAVEL		0		6" dia. steel standpipe w/ locking cap, +3 ft to 98 ft
			SILT, SAND & GRAVEL: w/ clay				
10			SAND & SILT: w/ clay		10		
20					20		Bentonite slurry annular seal, 0 ft to 98 ft
30			SILT, SAND & GRAVEL: w/ clay		30		
			SAND & SILT: w/ clay				
40					40		
50					50		2" dia. sch. 40 PVC riser pipe, +2.5 ft to 105 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: OW-4

DEPTH FEET	BLOWN YIELD (GPM)	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
60					60		6" dia. steel standpipe w/ locking cap, +3 ft to 98 ft
70					70		Bentonite slurry annular seal, 0 ft to 98 ft
			SILT, SAND & GRAVEL: w/ clay				
			SAND & SILT: w/ clay				
80			SAND & GRAVEL		80		2" dia. sch. 40 PVC riser pipe, +2.5 ft to 105 ft
90					90		6" dia. borehole, 0 ft to 120 ft
100					100		Bentonite chip annular seal, 98 ft to 102 ft
110					110		#0 grade sand, 102 ft to 120 ft
							2" dia. 10-slot PVC screen, 105 ft to 120 ft
120					120		2" bottom cap

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-1

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.10.0203*
LOGGED BY: *S. Fisher*
DATES DRILLED: *8/12/02 - 8/13/02*

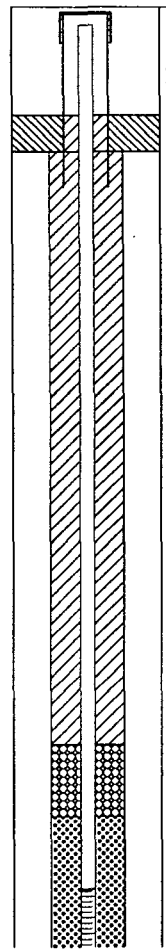
DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *Randy Neidlinger*
RIG TYPE: *CME 75*
DRILLING METHOD: *Hollow Stem Auger*
DEVELOPMENT DATE: *9/21/02*
LOCATION: *Northern edge of Probst property*

NOTES: SWL on 9/16/02 = 5.49 ft below TOC
Ground surface elevation: 246.70 ft amsl

CASING RIM ELEVATION: 249.12 ft amsl
EASTING 683,646.252
NORTHING 995,938.465

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
					SILT: gravel fill w/ geotextile below, 0'-1.5', then vegetation w/ olive black organic-rich silt w/ clay, peat in top 2' of deposit, dense, wet
	Augered to 10 ft				
	2-4-5-6	0	6"	1	SILT: olive gray (5 Y 4/1) tr. clay, tr. vf sand, sl laminated, wet
	6-6-8-8	0	18"	2	SILT: as above, more plastic, laminated w/ vf sand
	5-5-5-6	0	20"	3	SILT: med dk gray, silt w/incr. clay content, laminated w/ vf sand, more plastic
	WOH/1'-3-4	0	14"	4	SILT: as above, clay-rich top 2", occ black organic lamination, more distinct laminations
	3-4-7-8	0	24"	5	SILT: as above, w/ black organic lamination @4", v. clay-rich 6"-9", more olive gray below 9"
	WOR-WOH -5-5	0	14"	6	SAND & GRAVEL: olive gray, pred m-c w/vf & vc, w/ SA-R gravel, some silt, loose to cohesive, wet SAND & GRAVEL: dk yellowish brown (10 YR 4/2) to olive gray, pred m-c w/ f & vc, some silt and vf, w/ f SA-R gravel, clay layer 2"-6", cohesive to loose



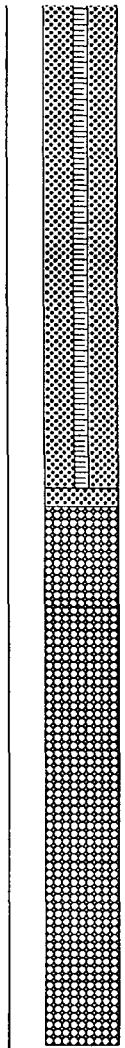
WELL CONSTRUCTION DETAILS:
- 6" dia. steel standpipe w/ locking cap
- Concrete surface apron
- 10" dia. borehole, 0 ft to 52 ft
- 2' dia. sch. 40 PVC riser pipe, +2.5 ft to 20.5 ft
- Bentonite slurry annular seal, 0 ft to 17.5 ft
- Bentonite chip annular seal, 17.5 ft to 19.5 ft
- #1 grade sand, 19.5 ft to 37 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-1

PROJECT: *Shenandoah Alternative Water Supply*

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
	5-7-9-9	0	18"	7	SAND & GRAVEL: as above, gravel composed of various lithologies, often white quartz, sl grading of gravels in sand
	5-6-9-11	0	20"	8	SAND & GRAVEL: as above, sl incr. in silt content below 5", more mod. yellow brown color, sl cleaner gravel below 13", silty vf sand @ 15"
	2-5-9-15	0	8"	9	SAND & GRAVEL: pred m-c w/ vc and f SR-R gravel, w/ less silt and vf sand, some m gravel, loose to sl cohesive
	8-7-11-15	0	13"	10	SAND & GRAVEL: as above, pred f-m w/ vf w/ SA-R gravel, some vc sand 5"-10", loose to sl cohesive
					SAND & GRAVEL: as above, olive gray, loose
	3-8-9-10	0	17"	11	SAND: lt olive brown (5 Y 5/6) to mod yell brown (10 YR 5/4), vf-f, tr m, tr silt, tr R gravel, color grades to olive gray at 9", laminated vf-f w/ m below 10", some c-vc & tr gravel at bottom
	5-9-11-11	0	21"	12	SAND & GRAVEL: f-m, w/ c-vc, f SA-R gravel
	9-9-10-10	0	22"	13	SAND: med dk gray, f-m, w/ vf, tr c, c-vc 11"-13", pred vf w/ silt below, sl laminated, dense, cohesive
					SAND & GRAVEL: sandy top 3", then f-m w/ c, some vc, tr vf and silt, w/ f SA-R gravel
	3-3-7-15	0	17"	14	SAND: olive gray, f-m w/ vf, tr c, some silt, silt laminations at bottom
	37-28-19-15	0	12"	15	SAND & SILT: olive gray vf w/ silt, sl laminated, color grades to mod yell brown below 11", some color layering, cohesive tr. qtz gravel at bottom
	8-10-13-13	0	9"	16	SILT, SAND & GRAVEL: mod yellow brown, silt w/ vf, some f-vc, w/ f-m A-SR dolostone gravel, tr R sandstone gravel at top, dense, cohesive
	20-15-14-20	0	8"	17	SILT, SAND & GRAVEL: mod yellow brown turning olive gray, dense, cohesive, vf-m w/ c, tr vc, w/ f-m A-SA dolostone gravel
	25-21-22-27	0	14"	18	SILT, SAND & GRAVEL: as above, less m-c sand, dense SILT, SAND & GRAVEL: as above, v. dense
	3-5-6-5	0	5"	19	SILT, SAND & GRAVEL: as above, v. dense, incr silt/clay
	13-15-17-25	0	19"	20	SILT, SAND & GRAVEL: as above, v. dense, tr SR fine qtz pebbles
	10-20-58 -50/3"	0	9"	21	SILT, SAND & GRAVEL: as above, tr SR fine gravel, wthrd dolostone at bottom DOLOSTONE: bedrock-auger refusal



WELL CONSTRUCTION DETAILS:
- 2" dia. 20-slot PVC screen, 20.5 ft to 36.5 ft
- #1 grade sand, 19.5 ft to 37 ft
- 2" bottom cap
- 10" dia. borehole, 0 ft to 52 ft
- Bentonite chip seal, 37 ft to 52 ft

GROUNDWATER SCIENCES CORPORATION

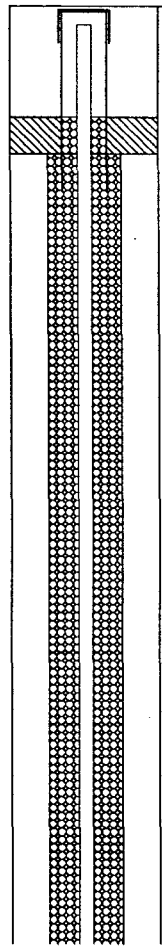
GEOLOGIC LOG: TW-2

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	*Shenandoah Alternative Water Supply*	DRILLING CO.:	*Eichelbergers Inc.*
SITE LOCATION:	*Town of East Fishkill, Dutchess Co., NY*	DRILLER:	*Randy Neidlinger*
JOB NO.:	*01003.10.0203*	RIG TYPE:	*CME 75*
LOGGED BY:	*S. Fisher*	DRILLING METHOD:	*Hollow Stem Auger*
DATES DRILLED:	*9/12/02 - 9/13/02*	DEVELOPMENT DATE:	*9/19/02*
		LOCATION:	*North-central portion of Probst property*

NOTES: SWL on 9/19/02 = 5.82 ft below TOC
Ground surface elevation: 248.12 ft amsl

CASING RIM ELEVATION: 250.56 ft amsl
EASTING 684,006.230
NORTHING 995,327.514

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
					SAND & SILT: road gravel & fabric 0-1 ft, then vegetation w/ dusky brown organic-rich silt and vf sand, w/ roots, wet at 4 ft
	Augered to 10 ft				
					SAND & SILT: dk gray (N3) to olive gray (5 Y 4/1), vf silty sand, wet
					SAND & SILT: olive gray, vf-f w/ silt, laminated with silt layers, silt layer 2"-3", cohesive to flowing, wet
	2-3-5-4	0	15"	1	
					SAND & SILT: as above, pred vf-f sand
	7-5-4-4	0	14"	2	
					SAND & SILT: as above, vf-f sand, v. silty, stiff 9"-11"
	5-4-4-5	0	19"	3	
					SAND & SILT: as above, w/ fine SR pebble at 2"
	2-3-3-2	0	14"	4	
					SAND & SILT: as above, w/ increasing silt content, more cohesive, silt laminations common between 5" and 15"
	3-2-3-2	0	18"	5	
					SAND & SILT: as above, cohesive, pred fine flowing sand 4"-6"
	3-3-4-4	0	15"	6	



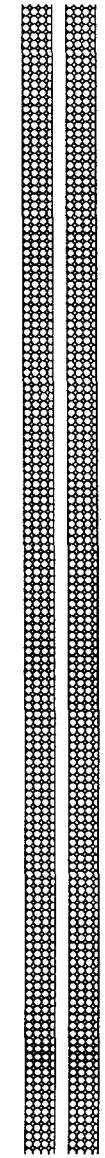
WELL CONSTRUCTION DETAILS:
- 6" dia. steel standpipe w/ locking cap
- Concrete surface apron
- 10" dia. HSA borehole 0 ft to 78 ft
- Bentonite chip annular seal, 0 ft to 59 ft
- 2" sch. 40 PVC riser pipe, +2.5 ft to 60 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-2

PROJECT: *Shenandoah Alternative Water Supply*

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
	4-2-3-3	0	16"	7	SAND & SILT: as above, homogeneous to sl laminated, less silt and flowing
24					
	4-4-4-5	0	11"	8	SAND & SILT: as above, cohesive
26					
	4-4-3-3	0	14"	9	SAND & SILT: as above, increasing silt, tr clay 12"-14", cohesive
28					
	4-4-4-4	0	11"	10	SILT: olive gray, dense, plastic, tr. clay, laminated, cohesive, w/ vf sand in lower 3"
30					
	2-2-3-3	0	10"	11	SILT: laminated, some vf sand
32					
	3-3-3-3	0	14"	12	SILT: olive gray, w/ clay, dense, plastic, laminated, moist to wet
34					
	4-5-5-7	0	15"	13	SILT: olive gray, w/ clay, dense, plastic, tr vf-f sand laminations in lower 4"
36					
	1-3-5-6	0	17"	14	SILT: olive gray, w/ occasional black organic laminations, dense, plastic
38					
	5-7-8-8	0	19"	15	SILT: olive gray, w/ clay, laminated, dense, plastic
40					
	1-3-5-5	0	14"	16	SILT: olive gray, w/ clay, laminated, dense, plastic
42					
	4-5-8-9	0	15"	17	SILT: olive gray, w/ clay, occasional black organic laminations, dense, plastic
44					
	5-8-8-13	0	11"	18	SILT: olive gray, w/ clay, occasional black organic laminations, dense, plastic
46					
	2-9-11-13	0	12"	19	SILT: olive gray, tr vf sand, dense, cohesive, more homogeneous
48					
	8-11-13-14	0	16"	20	SAND & SILT: olive gray, pred. silt w/ vf sand, tr f sand laminations between 4" and 6", cohesive
50					
	7-7-8-12	0	14"	21	SAND & SILT: olive gray, silt w/ vf sand, tr f sand laminations, cohesive, sl. color change @ 12" to light live gray (5 Y 5/2)
52					
	14-12-13-14	0	16"	22	SILT: lt olive gray to olive gray, massive, homogeneous, tr. vf sand, stiff, wet



WELL CONSTRUCTION DETAILS:
- 10" dia. HSA borehole 0 ft to 78 ft
- Bentonite chip annular seal, 0 ft to 59 ft
- 2" sch. 40 PVC riser pipe, +2.5 ft to 60 ft

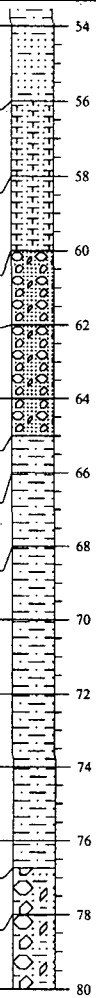
GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-2

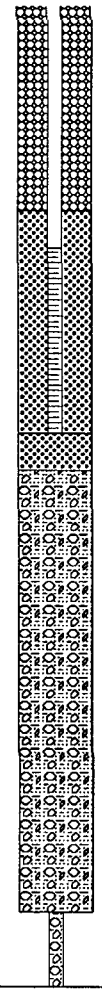
PROJECT: *Shenandoah Alternative Water Supply*

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
54					
	11-11-19-17	0	14"	23	SAND & SILT: olive gray to lt olive gray, pred silt w/ vf sand, incr. sand content w/ depth, sl. laminated, gradual color change to mod yellow brown (10 YR 5/4) @ 7".
56					
	1-4-7-7	0	15"	24	SILTY SAND: mod. yellowish brown to dk yellowish brown (10 YR 4/2), vf-f sand, some silt, w/ m sand below 12", horizontally laminated, some cross lamination top 8", cohesive to sl flowing
58					
	7-13-17-25	0	13"	25	SILTY SAND: dk yell brown, f-m, tr vf top 5", then vf silty sand, tr fine, thin c layer w/ m & vc, tr f gravel 8"-9", cohesive to loose, wthrd rock frags @ bottom
60					
	3-6-9-10	0	13"	26	SAND & GRAVEL: dk yellowish brown, c-vc w/ m, some vf-f, w/ f-m SR-R gravel, loose to sl. cohesive, wet
62					
	14-11-12-12	0	15"	27	SAND & GRAVEL: dk yellowish brown, pred c-vc w/ m, some vf-f, w/ f-m SR-R gravel, loose, wet
64					
	14-13-12-22	0	19"	28	SAND & GRAVEL: dk yellowish brown, pred c-vc w/ m, some vf-f, w/ f-m SR-R gravel, loose, wet
66					
	5-11-11-12	0	13"	29	SILT: mod. yellowish brown, pred silt, tr vf sand, tr clay, clay laminations @ 18", angled sharp top contact, cohesive, wet
68					
	7-7-8-10	0	19"	30	SILT: same as above top 5", then grading into vf-f sand, cohesive, color changing to olive gray below 5", pred silt, tr vf sand
70					
	9-6-9-8	0	18"	31	SILT: olive gray, silt w/ some vf sand, sl laminated, cohesive, wet
72					
	9-8-9-8	0	19"	32	SILT: as above, w/ clay laminations @ 8", m sand lamination @ 12", f SR pebble @ 15", cohesive
74					
	7-5-5-6	0	9"	33	SILT: as above, sl laminated, vf-f sand layers 12"-15", cohesive to sl. flowing
76					
	3-7-9-11	0	17"	34	SILT: olive gray, vf-f sand, some silt top 4", then pred silt, tr vf sand, cohesive
78					
	15-19-25-35	0	18"	35	SILT: olive gray, pred silt, tr vf sand, cohesive SILT, SAND & GRAVEL: olive gray, dense, stiff, silt and vf-f sand , tr m-vc, w/ f-m A-SA dolostone frags, wet SILT, SAND & GRAVEL: same as above top 12", moist to wet, then pred wthrd rock frags, dense, moist to wet
80					

GRAPHIC



WELL CONSTRUCTION



WELL CONSTRUCTION DETAILS
2" sch. 40 PVC riser pipe, +2.5 ft to 60 ft
20-slot PVC screen, 60' to 65'
#1 grade sand, 59 ft to 66 ft
2" bottom cap
10" dia. HSA borehole 0 ft to 78 ft
Collapsed formation, 66 ft to 80 ft
2" dia. split spoon boring 78 ft to 80 ft
Total Depth: 80 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-2A

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.10.0203*
LOGGED BY: *S. Fisher*
DATES DRILLED: *1/16/03 - 1/20/03*

DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *K. Weigle*
RIG TYPE: *IR T4W*
DRILLING METHOD: *Air Rotary*
DEVELOPMENT DATE: *February 2003*
LOCATION: *15 ft east of TW-2*

NOTES: Log is generalized & slightly modified from TW-2 log
Ground surface elevation: 247.82 ft amsl
SWL= 4.17' below TOC, 1/23/03

CASING RIM ELEVATION: 250.65 ft amsl
NORTHING: 995,341.069 EASTING: 684,026.245

DEPTH FEET	CUM. BLOWS YIELD	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
0			SAND & SILT		0		6" locking well cap
10					10		
20					20		
30			SILT: dark gray		30		
40					40		6" dia.steel casing, +2.5' to 59'
50					50		
			SILTY SAND: dark yellowish brown, some f-m gravel, silty				
			SAND & GRAVEL: f-c gravel, with m-vc sand, pred. dk yellowish brown m-vc sand in lower 1 foot of interval				5" x 6" neoprene K-packer
60					60		5" dia. 304 SS 100-slot V-wire telescoping screen, 59'-62'
			SILT: dark gray, sandy, dense				5" dia. SS sump, 62'-65'
70					70		

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-3

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.10.0203*
LOGGED BY: *S. Fisher*
DATES DRILLED: *4/2/03 - 4/10/03*

DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *E. Funk*
RIG TYPE: *Bucyrus Erie W-22*
DRILLING METHOD: *Cable Tool*
DEVELOPMENT DATE: *4/10/03 - 4/15/03*
LOCATION: *Former TW-3A location*

NOTES: Well was installed in former TW-3A borehole
Ground surface elevation: 263.75 ft amsl
SWL = 17.30' below TOC, 4/11/03

CASING RIM ELEVATION: 266.53 ft amsl
NORTHING: 993,939.822 EASTING: 684,249.650

DEPTH FEET	CUM. BLOWS YIELD	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
0			SAND & GRAVEL: dk yellowish brown (10 YR 4/2) f-vc sand with f-m SA-R gravel, loose, wet at 15 feet		0		8" locking well cap
10					10		
20			SAND & SILT: olive gray (5 Y 4/1) vf-f sand with silt, wet		20		
30					30		
40					40		8" dia.steel casing with driveshoe, +2.5' to 85'
50					50		
60					60		
70			SAND & GRAVEL: olive gray f-vc sand and f-m SA-R gravel, tr vf and silt, occ. cobbly zone, water-bearing		70		
80					80		6" x 8" neoprene K-packer
90					90		6" dia. 304 SS 30-slot V-wire telescoping screen, 85'-100'
100			SAND: olive gray f-m, some vf and silt, some gravel		100		6' dia. SS sump, 100'-105'
			SAND & SILT: vf sand with silt, trace gravel				
			SAND: pred m-c, with vc, trace vf-f				
			SILT, SAND & GRAVEL: dense, olive gray silt w/ vf sand, some f-vc, with f-m gravel				

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-3A

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.10.0203*
LOGGED BY: *S. Fisher*
DATES DRILLED: *8/30/02 - 9/5/02*

DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *R. Neidlinger/ C. Brenneman*
RIG TYPE: *CME 75/ Schramm*
DRILLING METHOD: *Hollow Stem Auger/ Air Rotary*
DEVELOPMENT DATE: *9/15/02*
LOCATION: *On knoll in central portion of site*

NOTES: SWL on 9/15/02 = 21.38 ft below TOC
Well installed 10 ft W of HSA boring in 6-in AR borehole
Well abandoned on 4/1/03, replaced by TW-3

CASING RIM ELEVATION: 267.08 ft amsl
EASTING 684,264.032
NORTHING 993,946.669

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION	WELL CONSTRUCTION DETAILS
						6" dia. steel standpipe w/ locking cap
					SAND & GRAVEL: mod. yellowish brown (10 YR 5/4) vf-f, w/ m-c, tr vc, w/ some f-m SR-R gravel, loose	Concrete surface apron
	Augered to 10 ft					
	4-3-2-2	0	12"	1	SAND & GRAVEL: dk yellowish brown (10 YR 4/2) m-c w/ f, some vf, tr f SA-SR gravel, homogeneous, loose, moist	6" dia. borehole, 0 ft to 106.5 ft
	4-3-3-4	0	13"	2	SAND & GRAVEL: as above, moist	
	4-4-4-4	0	12"	3	SAND & GRAVEL: as above w/ increasing c-vc sand, layered vc w/ f SA-SR gravel and m-c sand, loose	Bentonite slurry annular seal, 0 ft to 61 ft
	2-3-4-5	0	9"	4	SAND & GRAVEL: c-vc w/ f gravel, pred vf-f, some silt at bottom, cohesive, moist	
	3-2-3-3	0	19"	5	SAND & SILT: mod. yellowish brown silt layer at top, then f-m, w/ vf, layered with laminated silt, pred f-m w/ vf sand w/ silt lams at bottom, wet @ 6"	
	1-2-3-4	0	18"	6	SILT: mod. yellowish brown, to lt olive gray (5 Y 4/1), laminated, tr. clay and vf sand lams., cohesive, sl. plastic, wet	2" dia. sch. 40 PVC riser pipe, +2.5 ft to 65 ft
					SAND & SILT: med dk gray (N4) to olive gray (5 Y 4/1), vf w/ some f, silty.	

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-3A

PROJECT: *Shenandoah Alternative Water Supply*

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION	WELL CONSTRUCTION DETAILS
	3-4-4-4	0	17"	7	occ. 1"-2" thick silt layers, dense	
	5-4-4-4	0	15"	8	SAND: med dk gray, f-m, w/ vf top 9", then vf-f, little silt, sl. laminated, cohesive	
	2-3-2-2	0	11"	9	SILTY SAND: med dk gray, vf-f, some silt, sl. laminated, flowing	
	3-3-2-4	0	5"	10	SAND & GRAVEL: mod. yellowish brown, m-c w/ vc, some vf-f, tr silt, some f SA-SR gravel, loose	
	2-2-2-3	0	17"	11	SAND: med dk gray, vf-f, tr m, homogeneous, sl. flowing	6" dia. borehole, 0 ft to 106.5 ft
	6-3-3-4	0	9"	12	SAND: olive gray to med dk gray, vf-f, sl. laminations, cohesive to sl. flowing	
	4-4-4-4	0	10"	13	SILTY SAND: olive gray, vf-f, sl. laminations, tr. silt-rich layers up to 1" thick	
	4-3-3-4	0	9"	14	SAND: olive gray, vf, some f, tr. silt, laminated, sl. flowing	
	5-4-3-4	0	14"	15	SAND: as above	
	4-5-6-6	0	12"	16	SAND: as above, pred. vf sand, some f, some silt, laminated, pred f, some vf sand 9"-10", cohesive	Bentonite slurry annular seal, 0 ft to 61 ft
	4-4-5-4	0	11"	17	SAND & SILT: olive gray, vf w/ silt, sandy 6"-9", more dense, cohesive	
	3-3-3-3	0	9"	18	SAND & SILT: olive gray, layered vf w/ f and silt-rich zones, sl flowing, cohesive, laminated silt, tr. clay 8"-11"	
	1-3-3-4	0	17"	19	SILT: olive gray, laminated, tr clay, w/ occ. vf sand laminations, stiff, pred. vf sand at top, increasing silt/clay with depth	
	2-5-6-7	0	13"	20	SILT: olive gray, w/ clay, laminated, dense, plastic	
	4-4-3-5	0	18"	21	SAND & SILT: olive gray, vf w/ silt, laminated, some f sand, cohesive to sl flowing	2" dia. sch. 40 PVC riser pipe, +2.5 ft to 65 ft
	6-5-4-4	0	10"	22	SILTY SAND: olive gray, vf, tr. f, some silt, sl laminated, sl. flowing	
					SAND: olive gray, vf some f, tr. silt, homogeneous, sl laminated, cohesive	
					SAND: as above	

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-3A

PROJECT: *Shenandoah Alternative Water Supply*

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
	6-6-4-6	0	15"	23	
56					SAND & SILT: vf, w/ silt, sl laminated, cohesive
	3-3-4-4	0	9"	24	
58					SAND & SILT: as above, pred vf w/ silt
	5-4-3-3	0	13"	25	
60					SAND & SILT: as above, pred vf w/ silt
	4-3-3-4	0	9"	26	
62					SAND & SILT: as above, pred vf w/ silt
	3-3-3-3	0	8"	27	
64					SAND & SILT: olive gray, vf w/ more silt, sl laminated, dense, cohesive
	3-1-4-18	0	23"	28	SILT, SAND & GRAVEL: olive gray, vf-vc sand, w/ silt, and f-m SR-R gravel of various lithologies, cohesive
66					SAND & GRAVEL: as above, poorly sorted, cohesive to loose
	WOR-12-20-22	0	11"	29	
68					SAND & GRAVEL: as above, loose top 11", then cohesive, poorly sorted w/ coarser grades of sand w/ f-m gravel
	60-54-25-26	0	17"	30	
70					SAND & GRAVEL: as above, loose to cohesive
	WOR-7-9-11	0	7"	31	
72					SAND & GRAVEL: pred. m-vc, some vf-f, some silt, w/ f-m SR-R gravel, loose to cohesive, sl flowing, large dolostone frag at bottom
	9-11-35-43	0	11"	32	
74					SAND & GRAVEL: as above, large dolostone frags. 4"-6" and 8"-9", loose to crumbly
	26-21-9-15	0	14"	33	
76					SAND & GRAVEL: as above, loose to crumbly
	WOR-5-17-9	0	8"	34	
78					SAND & GRAVEL: as above, pred c-vc 4"-6", cohesive to loose
	4-3-4-6	0	10"	35	
80					SAND & GRAVEL: increasing m-vc sand, tr. silt, cohesive to loose
	WOR-6-15-17	0	10"	36	
82					SAND & GRAVEL: like above, but compacted, tight, pred f gravel w/ f-vc sand, some vf,tr silt, incr. vf and silt in lower 6"
	20-29-38-88	0	17"	37	
84					SAND & GRAVEL: as above, f-m gravel w/ f-vc sand matrix, some vf, tr silt, w/ f gravel of various lithologies
	96-47-48-34	0	12"	38	
86					SAND & GRAVEL: f-m w/ c, tr vf, some vc, tr silt, w/ f-m SA-R gravel, pred sand

WELL CONSTRUCTION DETAILS:

- Bentonite pellet annular seal, 61 ft to 64 ft
- #1 grade sand, 64 ft to 106.5 ft
- 2" dia. 20-slot PVC screen, 65 ft to 103 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-3A

PROJECT: *Shenandoah Alternative Water Supply*

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
	1/1.5'-8	0	5"	39	top 3", loose
88					SAND & GRAVEL: olive gray, c-vc, some f-m, tr vf and silt, w/ f SA-R gravel, some layering, cohesive, tight below 9"
	14-43-68-108	0	17"	40	
90					SAND & GRAVEL: olive gray, c-vc, some f-m tr vf and silt, w/ f SA-R gravel, layered with laminations of vf sand in top 5", loose to sl cohesive
	2-23-47-65	0	20"	41	
92					SAND & GRAVEL: heaving formation required augering ahead
	Augered to 93.5'	—			
94					SAND & GRAVEL: pred c-vc, some f-m, tr vf, w/ f SA-R gravel, cohesive to crumbly
	2-39-68-120	0	13"	42	
96					SAND & GRAVEL: pred c-vc w/ f gravel, some f-m, tr vf, tr silt, cohesive to crumbly
	9-64-73-155	0	15"	43	
98					SAND & GRAVEL: as above, cobbly
	150/3"	0	3"	44	
100					SAND: olive gray, f-m sand layered w/ vf and silt, grading into m-c, some vf-f below 10", some c-vc sand w/ f SR-R gravel 10"-13"
	27-36-85-100/4"	0	20"	45	
102					SAND & SILT: pred vf sand w/ silt, tr gravel, dense, cohesive
	16-35-74-100/4"	0	15"	46	SAND: pred m-c grading into vc w/ tr finer sands, homogeneous texture, cohesive to loose
104					
	103-135-123/4"	0	15"	47	SILT, SAND & GRAVEL: olive gray, v. dense, stiff, vf sand w/ silt matrix containing some f-vc sand, w/ f-m A-SR gravel of various lithologies, but dominated by dolostone
106					
	16-33-38-71	0	21"	48	SAND: olive gray, layered c-vc, some f-m, tr vf and silt, pred vf-f sand, some silt 12"-15", w/ c-vc sand, some f SA-SR gravel, tr vf-m below 15", cohesive to loose
108					
	56-130-100/3"	0	15"	49	SAND: olive gray, c-vc, some vf-m, tr silt, homogeneous, loose to sl cohesive, turning to vf sand w/ silt below 13", cohesive, more dense
110					
	62-150/4"	0	9"	50	SILT, SAND & GRAVEL: olive gray, v. dense, silt and vf sand matrix, some f-vc, w/ f-m A-SR gravel, tr large dolostone frags., stiff, moist
112					SILT, SAND & GRAVEL: as above, dense, stiff, w/ large dolostone fragments, moist to wet

WELL CONSTRUCTION DETAILS:

- 6" dia. borehole, 0 ft to 106.5 ft
- 2" dia. 20-slot PVC screen, 65 ft to 103 ft
- #1 grade sand, 64 ft to 106.5 ft
- 2" bottom cap
- 6" dia. borehole, 0 ft to 106.5 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-3AS

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.10.0203*
LOGGED BY: *S. Fisher*
DATES DRILLED: *1/8/03 - 1/23/03*

DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *K. Weigle*
RIG TYPE: *IR T4W*
DRILLING METHOD: *Air Rotary*
DEVELOPMENT DATE: *2/5/03 - 2/6/03*
LOCATION: *10 ft west of TW-3*

NOTES: See TW-3A log for soil description details
Ground surface elevation: 264.12 ft amsl
SWL= 18.83' below TOC, 1/24/03

CASING RIM ELEVATION: 267.10 ft amsl
NORTHING: 993,940.442 EASTING: 684,256.557

DEPTH FEET	CUM BLOWN YIELD	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
0			SAND & GRAVEL: dk yellowish brown (10 YR 4/2) f-vc sand with f-m SA-R gravel, loose, wet at 15 feet		0		8" locking well cap
10					10		
20			SAND & SILT: olive gray (5 Y 4/1) vf-f sand with silt, wet		20		
30					30		
40					40		8" dia.steel casing, +2.5' to 67.5'
50					50		
60					60		
			SAND & GRAVEL: olive gray f-vc sand and f-m SA-R gravel, water-bearing				6" x 8" neoprene K-packer
70					70		6" dia. 304 SS 140-slot V-wire telescoping screen, 67.5'-77.5'
80					80		6' dia. SS sump, 77.5'-82.5'

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-3D

PROJECT: *Shenandoah Alternative Water Supply*

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
60					SILTY SAND: as above with color change @3", some f SR-R gravel
	1-9-7-7	0	8"	26	SAND & GRAVEL: m-vc, w/ vf-f, and f SA-R gravel, loose, wet
62					SAND & GRAVEL: m-vc w/ vf-f, and f-m SR-R gravel, tr silt, loose to cohesive
	6-6-6-7	0	9"	27	
64					SAND & GRAVEL: no recovery - suspect loose sand & gravel
	7-8-9-8	0	0"	28	
66					SAND & GRAVEL: olive gray, f-c w/ vf, some vc, w/ f-m SA-SR gravel, some silt, cohesive
	WOH-5-5-5	0	7"	29	
68					SILT, SAND & GRAVEL: olive gray, silty, f-c w/ vc & vf, w/ f-m SA-R gravel, cohesive
	10-8-10-12	0	15"	30	
70					SILT, SAND & GRAVEL: olive gray, silty, f-c w/ vf, some vc, w/ f-m SA-R gravel, layered in pred sandy zones, cohesive
	WOH-12-18 -24	0	9"	31	
72					SILT, SAND & GRAVEL: olive gray, f-c, some vc, w/ vf, silty, f SR-R gravel, cohesive, tightly compacted, occ large SA rock frags
	50-47-54-100	0	24"	32	
74					SILT, SAND & GRAVEL: as above, vf-f silty matrix w/ m-vc sand and SR-R gravel, cobbly?, dense, moist to wet.
	100/2"	0	2"	33	
76					SILT, SAND & GRAVEL: as above but less dense, pred vf-f sand matrix, cohesive to crumbly, wet
	WOH/1'-12 -40	0	7"	34	
78					SILT, SAND & GRAVEL: olive gray, vf-f, w/ m-vc, w/ f-m SA-R gravel, cohesive, dense, moist to wet
	21-25-27-42	0	11"	35	
80					SILT, SAND & GRAVEL: as above, very dense top 4", then increasing sand, crumbly, moist to wet
	3-25-40-42	0	15"	36	
82					SILT, SAND & GRAVEL: as above, dense, occasional dolostone fragments
	41-42-58-47	0	7"	37	
84					SILT, SAND & GRAVEL: as above, dense, stiff, moist
	60-63-55-49	0	9"	38	
86					SILT, SAND & GRAVEL: olive gray, silty vf sand matrix, w/ SA-SR f gravel, less gravel than above, moist to wet
	5-14-16-18	0	15"	39	
88					SILT, SAND & GRAVEL: vf sand w/ silt, some f-m, tr c-vc, w/ SA-SR gravel, cohesive, softer than above
	9-15-12-10	0	6"	40	
90					SILT, SAND & GRAVEL: olive gray, f-m w/ vf, some c-vc, w/ SA-SR gravel, occ silty layer, cohesive, sl flowing, wet
	3-7-5-7	0	11"	41	
92					SILT, SAND & GRAVEL: olive gray, vf-f silty sand 3"-9" and 13"-18", pred f-m w/ vf elswhere, loose, flowing
	3-7-8-10	0	18"	42	
94					

GRAPHIC

WELL CONSTRUCTION

WELL CONSTRUCTION DETAILS

10" dia. HSA borehole, 0 ft to 116 ft

Bentonite chip annular seal, 0 ft to 88 ft

2" dia. sch. 40 PVC riser pipe, +2.5 ft to 89 ft

#1 grade sand, 88 ft to 94.5 ft

2" dia. 20-slot PVC screen, 89 ft to 94 ft

2" bottom cap

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-3D

PROJECT: *Shenandoah Alternative Water Supply*

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
	13-13-21-25	0	13"	43	SILT, SAND & GRAVEL: olive gray, silt & vf sand, some f, tr m-vc, w/ occ A-SA dolostone frags, tr red shale frags
96					
	WOR-1-12-17	0	10"	44	SILT, SAND & GRAVEL: olive gray vf-f sand and silt, occ A-SR gravel, cohesive, pale yellow brown silt-filled fracture angled 45 degrees, large white qtz pebble at top
98					
	18-20-17-18	0	11"	45	SILT, SAND & GRAVEL: olive gray, dense, stiff, silt and vf sand matrix, w/ f-m A-SR dolostone gravel, moist to wet
100					
	WOR-1-5-13	0	0"	46	SILT, SAND & GRAVEL: no recovery - some loose washed c sand and f gravel in spoon
102					
	13-9-13-12	0	7"	47	SILT, SAND & GRAVEL: olive gray, soft, vf-m sand w/ c-vc and f-m SA-SR gravel, cohesive, wet
104					
	4-12-13-8	0	10"	48	SILT, SAND & GRAVEL: as above, cohesive, more stiff, gravel is typically A-SA dolostone, wet
106					
	WOR-6-19-12	0	7"	49	SILT, SAND & GRAVEL: olive gray, vf-f w/ silt, some m-vc, w/ f-m A-SR gravel composed of dolostone, schist and quartz, cohesive, stiff
108					
	12-9-11-12	0	12"	50	SILT, SAND & GRAVEL: olive gray, silty vf-m w/ c-vc, w/ f-m A-SR gravel, large red shale frags 2"-5", cohesive to crumbly, wet
110					
	10-18-17-19	0	11"	51	SAND & GRAVEL: olive gray, f-c w/ vf and vc, w/ A-SR f-m gravel, layers dipping 45 deg., cohesive to crumbly, turning mod yell brown at bottom
112					
	20-26-39-18	0	6"	52	SILT, SAND & GRAVEL: mod yellowish brown (10 YR 5/4) silty, vf-vc sand, w/ large A dolostone frags, crumbly, wet
114					
	28-20-18-15	0	4"	53	SILT, SAND & GRAVEL: mod yellowish brown, silt and vf-f sand w/ A dolostone frags, cohesive to crumbly, wet
116					
118	NQ Core 116 - 119 ft	--	10"	R-1	COBBLY SILT, SAND, & GRAVEL: mod yellowish brown, silt and sand w/ gravel and cobbles composed of wthrd dolostone and shale, wet
120	NQ Core 119 - 122 ft	--	6"	R-2	COBBLY SILT, SAND, & GRAVEL: mod yellowish brown, sand, silt, and clay w/ SA-R gravel and cobbles of various lithologies (schist, quartz, shale, and dolostone)
122	100/4"	0	4"	54	WEATHERED DOLOSTONE: pred broken wthrd dolostone w/ silt and clay matrix, tr sand, loose to cohesive, wet
124					
126	NQ Core 122.5 - 127 ft	--	60"	R-3	DOLOSTONE: med dark gray, sandy dolostone, w/ abundant white calcite veining, occ. iron-stained fractures, red hematite-bearing fracture between 122' and 123.5', competent 123' to 126.5', weathered and vuggy w/ iron-staining below 126.5', broken, bedding dips approx. 45 degrees.

GRAPHIC

WELL CONSTRUCTION

WELL CONSTRUCTION DETAILS

10" dia. HSA borehole, 0 ft to 116 ft

Bentonite chip borehole seal, 94.5 ft to 127 ft

2" dia. NQ Core borehole, 116 ft to 127 ft

Total Depth: 127 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-3D

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	*Shenandoah Alternative Water Supply*	DRILLING CO.:	*Eichelbergers Inc.*
SITE LOCATION:	*Town of East Fishkill, Dutchess Co., NY*	DRILLER:	*Randy Neidlinger*
JOB NO.:	*01003.10.0203*	RIG TYPE:	*CME 75*
LOGGED BY:	*S. Fisher*	DRILLING METHOD:	*Hollow Stem Auger*
DATES DRILLED:	*9/5/02 - 9/11/02*	DEVELOPMENT DATE:	*9/15/02*
		LOCATION:	*Central portion of site, near Gayhead Creek*

NOTES: Deeper piezometer located approx. 10 ft N. of Well #3S
Ground surface elevation: 250.05 ft amsl
SWL on 9/15/02 = 10.47 ft below TOC

CASING RIM ELEVATION: 252.66 ft amsl
EASTING 5593.8293
NORTHING 6711.6697

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
					SILT: gravel and fabric top 1 ft, then olive gray silt, w/ vf-f sand, tr m-vc, tr. f SR-R gravel, organic, moist
	Augered to 10 ft				
	1-3-4-5	0	12"	1	SAND & GRAVEL: olive gray, m-c w/ vc and vf-f, some silt, f SR-R gravel throughout, organic silt at top, cohesive to loose, wet
	4-4-3-3	0	20"	2	SAND & GRAVEL: as above w/ more gravel
					SAND & SILT: layered vf-f w/ silt, laminations of f-m, some c-vc, cohesive to loose
	3-3-3-4	0	12"	3	SAND & SILT: laminated, tr clay, sl plastic, cohesive, large wthrd shale pebble 5"-6"
	1-3-4-5	0	15"	4	SANDY SILT: olive gray, w/ laminations of vf-f sand, clayey silt layer at top, cohesive, sl. plastic
	3-4-4-5	0	15"	5	SILT: olive gray, laminated, occ. vf-f sand lamination, clay-rich layer 7"-8", stiff, wet
	1-2-4-5	0	17"	6	SILT: olive gray, laminated (varved) some clay, dense, plastic, tr vf sand laminations
	3-5-7-10	0	17"	7	SILT: as above, less clay and pred silt w/ tr vf sand below 13"
					SILT: olive gray, laminated, tr vf-m sand laminations, cohesive

WELL CONSTRUCTION DETAILS:
- 6" dia. steel standpipe w/ locking cap
- Concrete surface apron
- 10" dia. HSA borehole, 0 ft to 116 ft
- Bentonite chip annular seal, 0 ft to 88 ft
- 2" dia. sch. 40 PVC riser pipe, +2.5 ft to 89 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-3D

PROJECT: *Shenandoah Alternative Water Supply*

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
	4-4-5-7	0	13"	8	
	1-2-2-2	0	15"	9	SANDY SILT: olive gray, pred silt w/ clayey zones, laminated, pred vf sand & silt 4"-8", occ. f-vc sand laminations, cohesive to sl flowing in sands
	3-7-7-7	0	11"	10	SAND & GRAVEL: same as above top 2", then dk gray, m-vc, some vf-f, tr silt, w/ f-m SA-R gravel of various lithologies, sl. cohesive to loose
					SAND & GRAVEL: same as above top 6"
	4-2-4-4	0	15"	11	SILT: olive gray, laminated, w/ clayey seams, occ f-c sand laminations, tr vc, cohesive, stiff
	4-5-6-7	0	16"	12	SILT: as above, tr vf-f sand, laminated, stiff
					SILT: as above
	5-7-8-10	0	15"	13	SAND & GRAVEL: m-c w/ f & vc, some vf, some f SA-R gravel, loose
					SILT: olive gray, laminated, tr vf-f sand, stiff
	1-4-7-7	0	10"	14	SILT: olive gray, laminated, large pebble 2"-3", loose, m-vc, gravelly layer 4"-6", tr vf laminations
	8-6-8-9	0	16"	15	SAND & SILT: olive gray, silt w/ vf sand laminations, tr f sand, pred vf sand below 10", dense
	1-3-5-5	0	10"	16	SAND: olive gray, vf-f sand, tr silt, sl laminated, cohesive
	5-6-5-7	0	15"	17	SAND: olive gray, vf-f, some silt, homogeneous, cohesive
	6-8-8-9	0	16"	18	SAND: pred vf-f sand, tr m-c, some embedded f SR-R gravel top 4", grading into vf-f sand, tr silt, homogeneous, cohesive
	WOH-2-4-5	0	11"	19	SILTY SAND: olive gray, vf-f sand, some silt, sl laminated, cohesive
	5-6-6-7	0	19"	20	SILTY SAND: olive gray, vf sand, some f, tr silt, sl laminated, cohesive
	6-8-10-12	0	14"	21	SILTY SAND: olive gray, vf sand, some silt, tr f, sl laminated, cohesive
	12-10-9-11	0	22"	22	SILTY SAND: olive gray, vf sand, some silt, tr f, sl laminated, cohesive
	9-8-7-8	0	18"	23	SILTY SAND: olive gray, vf sand, some silt, tr f, sl laminated, cohesive
	WOH/1'-2-3	0	14"	24	SILTY SAND: olive gray, fine sand, w/ vf, tr silt, homogeneous, stiff, cohesive, tr silt laminations
	2-3-3-4	0	11"	25	SILTY SAND: olive gray, vf-f, some silt, sl. laminated, cohesive to sl flowing

WELL CONSTRUCTION DETAILS:
- 10" dia. HSA borehole, 0 ft to 116 ft
- Bentonite chip annular seal, 0 ft to 88 ft
- 2" dia. sch. 40 PVC riser pipe, +2.5 ft to 89 ft

GROUNDWATER SCIENCES CORPORATION

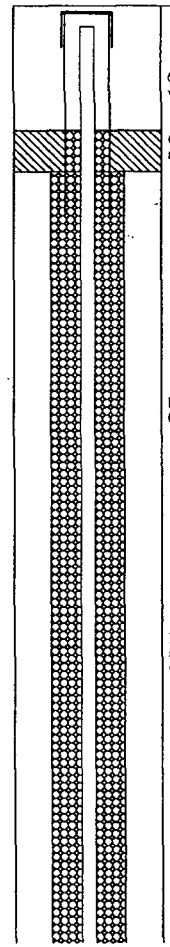
GEOLOGIC LOG: TW-3S

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	*Shenandoah Alternative Water Supply*	DRILLING CO.:	*Eichelbergers Inc.*
SITE LOCATION:	*Town of East Fishkill, Dutchess Co., NY*	DRILLER:	*Randy Neidlinger*
JOB NO.:	*01003.10.0203*	RIG TYPE:	*CME 75*
LOGGED BY:	*S. Fisher*	DRILLING METHOD:	*Hollow Stem Auger*
DATES DRILLED:	*9/11/02 - 9/12/02*	DEVELOPMENT DATE:	*9/15/02*
		LOCATION:	*Central portion of site, north of knoll*

NOTES: Shallow piezometer located approx. 10 ft S. of Well #3D
Ground surface elevation: 249.98 ft amsl
SWL on 9/15/02 = 7.56 ft below TOC

CASING RIM ELEVATION: 252.56 ft amsl
EASTING 684,068.701
NORTHING 994,008.542

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
					SILT: gravel and fabric top 1 ft, then olive gray silt, w/ vf-f sand, tr m-vc, tr. f SR-R gravel, organic, moist
	Augered to 10 ft				
10	1-3-4-5	0	12"	1	SAND & GRAVEL: olive gray, m-c w/ vc and vf-f, some silt, f SR-R gravel throughout, organic silt at top, cohesive to loose, wet
12	4-4-3-3	0	20"	2	SAND & GRAVEL: as above w/ more gravel SAND & SILT: layered vf-f w/ silt, laminations of f-m, some c-vc, cohesive to loose
14	3-3-3-4	0	12"	3	SAND & SILT: laminated, tr clay, sl plastic, cohesive, large wthrd shale pebble 5"-6"
16	1-3-4-5	0	15"	4	SANDY SILT: olive gray, w/ laminations of vf-f sand, clayey silt layer at top, cohesive, sl. plastic
18	3-4-4-5	0	15"	5	SILT: olive gray, laminated, occ. vf-f sand lamination, clay-rich layer 7"-8", stiff, wet



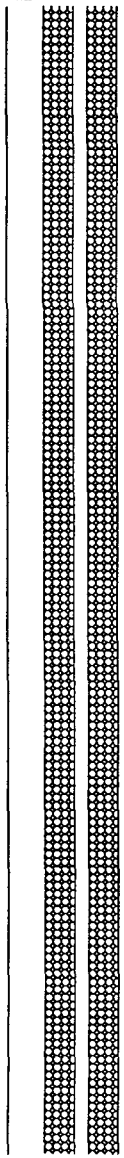
WELL CONSTRUCTION DETAILS:
- 6" dia. steel standpipe w/ locking cap
- Concrete surface apron
- 10" dia. HSA borehole, 0 ft to 72 ft
- Bentonite chip annular seal, 0 ft to 61 ft
- 2" dia. sch. 40 PVC riser pipe, +2.5 ft to 62 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-3S

PROJECT: *Shenandoah Alternative Water Supply*

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
20	1-2-4-5	0	17"	6	SILT: olive gray, laminated (varved) some clay, dense, plastic, tr vf sand laminations
22	3-5-7-10	0	17"	7	SILT: as above, less clay and pred silt w/ tr vf sand below 13"
24	4-4-5-7	0	13"	8	SILT: olive gray, laminated, tr vf-m sand laminations, cohesive
26	1-2-2-2	0	15"	9	SANDY SILT: olive gray, pred silt w/ clayey zones, laminated, pred vf sand & silt 4"-8", occ. f-vc sand laminations, cohesive to sl flowing in sands
28	3-7-7-7	0	11"	10	SAND & GRAVEL: same as above top 2", then dk gray, m-vc, some vf-f, tr silt, w/ f-m SA-R gravel of various lithologies, sl. cohesive to loose
30	4-2-4-4	0	15"	11	SAND & GRAVEL: same as above top 6" SILT: olive gray, laminated, w/ clayey seams, occ f-c sand laminations, tr vc, cohesive, stiff
32	4-5-6-7	0	16"	12	SILT: as above, tr vf-f sand, laminated, stiff
34	5-7-8-10	0	15"	13	SILT: as above SAND & GRAVEL: m-c w/ f & vc, some vf, some f SA-R gravel, loose
36	1-4-7-7	0	10"	14	SILT: olive gray, laminated, tr vf-f sand, stiff SILT: olive gray, laminated, large pebble 2"-3", loose, m-vc, gravelly layer 4"-6", tr vf laminations
38	8-6-8-9	0	16"	15	SAND & SILT: olive gray, silt w/ vf sand laminations, tr f sand, pred vf sand below 10", dense
40	1-3-5-5	0	10"	16	SAND: olive gray, vf-f sand, tr silt, sl laminated, cohesive
42	5-6-5-7	0	15"	17	SAND: olive gray, vf-f, some silt, homogeneous, cohesive
44	6-8-8-9	0	16"	18	SAND: pred vf-f sand, tr m-c, some embedded f SR-R gravel top 4", grading into vf-f sand, tr silt, homogeneous, cohesive
46	WOH-2-4-5	0	11"	19	SILTY SAND: olive gray, vf-f sand, some silt, sl laminated, cohesive



WELL CONSTRUCTION DETAILS:
- 2" dia. sch. 40 PVC riser pipe, +2.5 ft to 62 ft
- 10" dia. HSA borehole, 0 ft to 72 ft
- Bentonite chip annular seal, 0 ft to 61 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-3S

PROJECT: *Shenandoah Alternative Water Supply*

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
48							48		
	5-6-6-7	0	19"	20	SILTY SAND: olive gray, vf sand, some f, tr silt, sl laminated, cohesive				2" dia. sch. 40 PVC riser pipe, +2.5 ft to 62 ft
50							50		
	6-8-10-12	0	14"	21	SILTY SAND: olive gray, vf sand, some silt, tr f, sl laminated, cohesive				
52							52		
	12-10-9-11	0	22"	22	SILTY SAND: olive gray, vf sand, some silt, tr f, sl laminated, cohesive				
54							54		
	9-8-7-8	0	18"	23	SILTY SAND: olive gray, vf sand, some silt, tr f, sl laminated, cohesive				10" dia. HSA borehole, 0 ft to 72 ft
56							56		
	WOH/1'-2-3	0	14"	24	SILTY SAND: olive gray, fine sand, w/ vf, tr silt, homogeneous, stiff, cohesive, tr silt laminations				
58							58		
	2-3-3-4	0	11"	25	SILTY SAND: olive gray, vf-f, some silt, sl. laminated, cohesive to sl flowing				Bentonite chip annular seal, 0 ft to 61 ft
60							60		
	1-9-7-7	0	8"	26	SILTY SAND: as above with color change @3", some f SR-R gravel SAND & GRAVEL: m-vc, w/ vf-f, and f SA-R gravel, loose, wet				
62							62		
	6-6-6-7	0	9"	27	SAND & GRAVEL: m-vc w/ vf-f, and f-m SR-R gravel, tr silt, loose to cohesive				
64							64		
	7-8-9-8	0	0"	28	SAND & GRAVEL: no recovery - suspect loose sand & gravel				#1 grade sand, 61 ft to 72 ft
66							66		
	WOH-5-5-5	0	7"	29	SAND & GRAVEL: olive gray, f-c w/ vf, some vc, w/ f-m SA-SR gravel, some silt, cohesive				
68							68		
	10-8-10-12	0	15"	30	SILT, SAND & GRAVEL: olive gray, silty, f-c w/ vc & vf, w/ f-m SA-R gravel, cohesive				2" dia. 20-slot PVC screen, 62 ft to 72 ft
70							70		
	WOH-12-18 -24	0	9"	31	SILT, SAND & GRAVEL: olive gray, silty, f-c w/ vf, some vc, w/ f-m SA-R gravel, layered in pred sandy zones, cohesive				
72							72		2" bottom cap Total Depth: 72 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-4

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.10.0203*
LOGGED BY: *S. Fisher*
DATES DRILLED: *8/26/02 - 8/28/02*

DRILLING INFORMATION

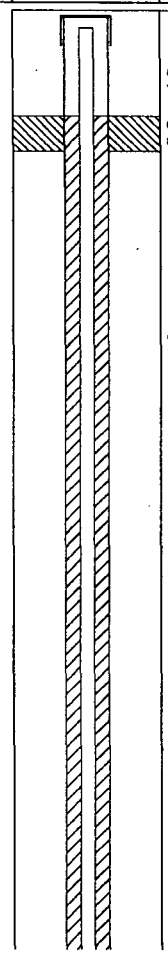
DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *R. Neidlinger/C. Brenneman*
RIG TYPE: *CME 75/Schramm*
DRILLING METHOD: *Hollow Stem Auger/Air Rotary*
DEVELOPMENT DATE: *9/14/02*
LOCATION: *S. portion of Probst property, N. of sand & gravel pit*

NOTES: SWL on 9/14/02 = 6.65 ft below TOC
Ground surface elevation: 250.46 ft amsl
Well installed 10' S of HSA boring in 6-in. AR borehole

CASING RIM ELEVATION 252.60 ft amsl
EASTING 684,187.817
NORTHING 993,287.800

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
2					
0					SILTY SAND: gravel fill and fabric 0-1', then vegetation w/ olive black (5 Y 2/1) organic-rich silt, and vf-f sand, turning dk yellowish brown (10 YR 4/2) below 3', tr fine gravel, moist to wet
2					
4					
6	Augered to 10 ft				
8					
10	1-1-2-2	0	13"	1	SILT: med dk gray (N4) to olive gray (5 Y 4/1), some vf sand, laminated, tr clay, dense, sl plastic
12	2-2-1-2	0	14"	2	SILT: as above w/ black organic-rich laminations w/ clay between 3"-12", plastic, dense, wet
14	1-2-3-2	0	22"	3	SILT: as above, pred silt, some clay, tr vf sand, sl plastic, tr rootlets, organic laminations 16"-20"
16	WOH/2'	0	18"	4	SILT: as above, w/ numerous black organic laminations, sl. increase in clay, plastic, dk gray SR dolostone pebble @ 8"
18	WOH/2'	0	20"	5	SILT: as above, w occ. vf-f sand laminations 15"-17", soft top 11", v. plastic
20	WOH/2'	0	15"	6	SILT: as above, tr vf-f sand laminations 3"-4", black organic laminations and masses elsewhere, less clay below 10"
22	WOH-1-3-4	0	12"	7	SILT: as above, cohesive, plastic, tr vf-f sand laminations at bottom

WELL CONSTRUCTION



WELL CONSTRUCTION DETAILS

6" dia. steel standpipe w/ locking cap
Concrete surface apron
6" dia. borehole, 0 ft to 93 ft
Bentonite slurry annular seal, 0 ft to 80 ft
2" dia. sch. 40 PVC riser pipe, +2.5 ft to 78 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-4

PROJECT: *Shenandoah Alternative Water Supply*

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
24					SILT: as above w/ increasing vf-f sand, laminated, dense
26	6-6-10-13	0	14"	8	SAND & GRAVEL: dk gray, cohesive to loose, m-vc, w/ vf-f, some silt, w/ f-m SA-R gravel, occ pebble up to 2", wet
28	WOH-5-6-7	0	5"	9	SAND & GRAVEL: as above, large R quartz pebble at 2"-3", red R pebbles at 4"-5", crumbly
30	7-5-6-5	0	7"	10	SAND & GRAVEL: pred m-vc w/ f-m SR-R gravel, some vf-f sand, tr silt, occ large pebbles up to 2", loose to sl cohesive
32	2-3-3-3	0	9"	11	SAND & GRAVEL: as above, loose to sl cohesive
34	5-4-4-5	0	10"	12	SAND & GRAVEL: as above, w/ more gravel, color change at 12" to lt olive brown (5 Y 5/6), sl incr. in gravel at bottom
36	6-6-6-7	0	15"	13	SAND: dk gray to olive gray, m-vc, some vf-f, tr silt, homogeneous texture
38	6-4-5-5	0	6"	14	SAND: olive gray to dk gray, layered vf sand, tr silt, w/ layers of m-c w/ vf-f 2"-3" and 6"-8"
40	7-7-8-9	0	15"	15	SAND: layered, m-c w/ zones of f-m, some vf, tr silt
42	3-5-6-7	0	15"	16	SAND: pred vf-f sand, tr m, some silt, cohesive, dense
44	6-5-6-6	0	14"	17	SAND: pred vf-f, w/ zones of f-m w/ tr c between 9"-10" and 11"-12", cohesive, dense
46	9-7-7-8	0	17"	18	SAND: pred vf-f, layered w/ zones of f-m, tr c, tr f gravel and vc sand, cohesive
48	3-3-2-3	0	9"	19	SAND: dk gray, pred c w/ m, some vf-f, tr silt, tr vc and f gravel, homogeneous, cohesive
50	5-5-8-8	0	13"	20	SAND: pred f-m, some vf, tr c, tr silt, homogeneous, cohesive to flowing
52	2-3-5-7	0	16"	21	SAND: f-m w/ zones of vf, tr c-vc, tr SR-R gravel, large quartz pebble @ 3"
54	4-5-7-7	0	15"	22	SAND: pred. f-m w/ zones of vf-f, cohesive to loose
56	6-7-7-11	0	16"	23	SAND: pred. m-c w/ f, some vf, tr silt, tr

WELL CONSTRUCTION

WELL CONSTRUCTION DETAILS

6" dia. borehole, 0 ft to 93 ft
Bentonite slurry annular seal, 0 ft to 80 ft
2" dia. sch. 40 PVC riser pipe, +2.5 ft to 78 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-4

PROJECT: *Shenandoah Alternative Water Supply*

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION	WELL CONSTRUCTION DETAILS
	2-2-3-6	0	15"	24	vc, cohesive	
58					SAND: pred f-m, some c and vf, tr silt, tr f R gravel, homogeneous	
	5-6-6-8	0	17"	25		
60					SAND: pred f-m, w/ vf, tr silt, sl laminated, sl flowing, sl incr in silt	
	1-2-2-4	0	15"	26		
62					SAND: f-m, w/ vf, tr c, tr silt, sl laminated, cohesive	6" dia. borehole, 0 ft to 93 ft
	3-4-5-6	0	18"	27		
64					SAND: f-m w/ vf, some silt, tr f R gravel top 4", then fining to f w vf at 12", then f-m w/ some c, finer near bottom, cohesive w/ more silt	
	7-8-8-8	0	17"	28		
66					SILTY SAND: f-m w/ some c and vf, silty, laminated, occ silt-rich vf-f sand layer, cohesive	Bentonite slurry annular seal, 0 ft to 80 ft
	2-3-2-5	0	17"	29		
68					SAND: pred m w/ f, some c, tr silt, faint layering, cohesive	
	4-5-7-7	0	19"	30		
70					SAND: pred vf-f sand, some m sand zones, cohesive	2" dia. sch. 40 PVC riser pipe, +2.5 ft to 78 ft
	3-4-4-5	0	10"	31		
72					SAND: pred m-c, tr vc, some vf-f, tr silt, homogeneous, changing to pred vf-f, some silt lower 2"	
	4-5-7-7	0	24"	32		
74					SILT: olive gray, w/ some vf sand, homogeneous, sl laminations, cohesive, dense	Bentonite chip annular seal, 72 ft to 76 ft
	2-3-3-3	0	7"	33		
76					SAND & SILT: olive gray, layered, silt w/ vf-f sand, c sand layer 2"-3", tr f SR-R gravel near bottom, cohesive	
	5-6-11-14	0	10"	34		
78					SILT, SAND & GRAVEL: olive gray, pred vf-f, some m-c, w/ f-m SR-R gravel, dense, cohesive	
	7-7-8-15	0	7"	35		
80					SILT, SAND & GRAVEL: as above, w/ SR-R gravel up to 2", cohesive to sl crumbly	2" dia. 20-slot PVC screen, 78 ft to 88 ft
	6-14-11-9	0	5"	36		
82					SILT, SAND & GRAVEL: as above w/ occ SA rock frgments	
	10-14-12-10	0	13"	37		
84					SILT, SAND & GRAVEL: as above, vf-f w/ m-c tr vc, some silt, gravel composed of pred SA-SR dolostone frags	#1 grade sand, 76 ft to 93 ft
	21-17-15-16	0	12"	38		
86					SILT, SAND & GRAVEL: olive gray, vf-f w/ m, some c-vc, some silt, w/ f-m SA-R gravel, cohesive	
	11-11-16-18	0	13"	39		
88					SILT, SAND & GRAVEL: olive gray, vf w/ f, some m-c, tr vc w/ f-m SA-SR dolostone gravel, dense, stiff, v gravelly	2" bottom cap
	34-63-62-68	0	16"	40		Total depth: 88 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-4

PROJECT: *Shenandoah Alternative Water Supply*

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
90					7"-10"
	38-48-83-94	0	20"	41	SILT, SAND & GRAVEL: olive gray, vf sand, some silt, some f-m, tr c-vc, w/ f-m A-SR gravel throughout, pred dolostone frags lower 4"
92					SILT, SAND & GRAVEL: as above, f-m w/ some c 11"-13", dense, stiff
	38-35-30-38	0	18"	42	
94					SILT, SAND & GRAVEL: dense, w/ zones of pred rock frags, large red sandstone pebble at 11"-13", matrix is pred vf sand w/ silt
	33-40-43-43	0	15"	43	
96					SILT, SAND & GRAVEL: as above, v gravelly top 3", moist to wet
	50-66-70-75	0	19"	44	
98					SILT, SAND & GRAVEL: as above, dense
	145/5"	0	5"	45	
100					SILT, SAND & GRAVEL: no recovery-suspect silt, sand, & gravel
102	NQ Core 100 - 103 ft	0	0"	R-1	
104	NQ Core 103 - 105 ft	0	2"	R-2	SILT, SAND & GRAVEL: as above
106	NQ Core 105 - 108 ft	0	3"	R-3	SILT, SAND & GRAVEL: as above
108					SILT, SAND & GRAVEL: as above
110	NQ Core 108 - 113 ft	0	6"	R-4	
112					
114					SILT, SAND & GRAVEL: as above, occ cobble, v gravelly
116	NQ Core 113 - 118 ft	0	6"	R-5	
118					

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-4A

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.10.0203*
LOGGED BY: *S. Fisher*
DATES DRILLED: *8/14/02 - 8/22/02*

DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *R. Neidlinger/ C. Brenneman*
RIG TYPE: *CME 75/Schramm*
DRILLING METHOD: *Hollow Stem Auger/ Air Rotary*
DEVELOPMENT DATE: *9/14/02*
LOCATION: *S. portion of site, in sand & gravel pit*

NOTES: SWL on 9/14/02 = 10.25 ft below TOC
Ground surface elevation: 254.57 ft amsl
Well installed 15' SW of HSA boring in 6-in. AR borehole

CASING RIM ELEVATION: 257.12 ft amsl
EASTING 684,083.604
NORTHING 992,997.498

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
					SILT, SAND & GRAVEL: dk yellowish brown (10 YR 4/2), f-m, w/ vf, some c, tr. vc, tr. f SR gravel, loose, moist, wet below 5 ft
					SAND & SILT: dk yellowish brown, no gravel below 4 feet
	Augered to 10 feet				
	WOR-2-2-3	0	18"	1	SAND & SILT: dk yellowish brown, vf sand w/ silt, faintly laminated, cohesive, with layers of f-m w/ vf @ 4", 6", 8-9", and 10-11"
	2-3-4-5	0	24"	2	SAND & SILT: as above, sl. dusky yellow color in silty zones, f-m sand layers @ 3", 5", 6-8", then pred. silt w/ vf sand, sl. laminated
	3-3-4-5	0	24"	3	SAND & GRAVEL: dk yellowish-brown, m-c w/ vc, some vf-f, tr. silt, w/ fine SR-R gravel, loose to slightly cohesive
					SAND & SILT: dk yellowish brown, vf sand, tr. f, w/ silt, cohesive
	WOR-1-1-1	0	24"	4	SAND: dk yellowish brown, f-m, w/ f, some vf and c-vc, tr fine SR-R gravel, homogeneous texture, cohesive to flowing
	2-2-3-4	0	24"	5	SAND & GRAVEL: m-c sand w/ vc, some vf-f, with f-m SR-R gravel, loose
	2-2-2-3	0	17"	6	SAND: dk yellowish brown, m-c, some vf-f, tr. silt, pred. vf sand and silt with color changing to olive gray below 19 ft
	4-2-2-3	0	16"	7	SAND: olive gray (5 Y 4/1) to med dk gray (N4), m-c w/ vc, some f SR-R gravel, large pebble @ 5", grading into pred. vf-f sand, some silt, cohesive
					SILTY SAND: med dk gray, vf-f, trace m, some silt, homogeneous texture, cohesive

WELL CONSTRUCTION DETAILS:
- 6" dia. steel standpipe w/ locking cap
- Concrete surface apron
- 6" dia. borehole, 0 ft to 120 ft
- Bentonite slurry annular seal, 0 ft to 80 ft
- 2" dia. sch. 40 PVC riser pipe, +2.5 ft to 86ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-4A

PROJECT: *Shenandoah Alternative Water Supply*

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
	2-3-3-3	0	16"	8	SILTY SAND: as above, homogeneous
	1-2-2-2	0	13"	9	SILTY SAND: med dk gray, m-f, w/ vf, tr. c-vc, tr. f SR-R gravel
	5-3-4-5	0	9"	10	SILTY SAND: med dk gray, to olive gray, vf-f, some silt, tr m-c, cohesive
	WOH-1-1-2	0	13"	11	SILTY SAND: med dk gray, m-c, some f & vc, tr vf, layered with vf silty sand, occ. thin laminations of c sand, loose to sl. cohesive
	2-3-3-4	0	12"	12	SILTY SAND: same as above top 3", then vf-f w/ silt, occ. layers of f-m w/ vf sand and m-c sand
	6-5-5-5	0	12"	13	SAND: med dk gray, pred. m w/ f, some vf, little c, some silt, cohesive to loose
	1-2-3-3	0	14"	14	SAND: med dk gray, m w/ f, tr c-vc, some vf, tr silt, cohesive to sl flowing, faintly laminated
	3-4-5-5	0	15"	15	SAND: med dk gray, f-m, w/ vf, tr c, tr silt
	1-2-3-5	0	14"	16	SAND: med dk gray, f-m, w/ vf, tr c, tr silt
	4-3-3-6	0	18"	17	SAND: med dk gray, m-c w/ some vf-f in top 6", grading into vf-f some silt, cohesive
	6-3-4-4	0	14"	18	SAND: med dk gray, f-m w/ vf, some silt, m-c layer w/ little fines between 6" and 8"
	WOH-1-2-3	0	10"	19	SAND: med dk gray, f-m w/ vf, some silt, some layering, cohesive
	5-4-4-5	0	12"	20	SAND: med dk gray, f-m w/ vf, some silt, some layering, cohesive
	1-1-3-3	0	12"	21	SILTY SAND: med dk gray, f-m w/ vf, silty, pred vf w/ silt below 5", dense, sl. plastic, cohesive, varved
	3-4-5-8	0	14"	22	SILT: olive gray to med dk gray, varved w/ vf sand laminations, tr. clay, occ. f sand lams., sl.plastic
	5-8-8-10	0	18"	23	SILTY SAND: olive gray to med dk gray, vf-f, some m, silty, m-c layer @ 10", pred f w/ less silt below, cohesive to loose
	WOH-1-2-3	0	12"	24	SAND: med dk gray, vf-f, tr m, some silt, pred f-m, some vf at bottom, sl flowing
	2-6-6-9	0	17"	25	SAND: med dk gray, vf-f, some silt, tr. m, faintly laminated

WELL CONSTRUCTION DETAILS:
- 6" dia. borehole, 0 ft to 120 ft
- Bentonite slurry annular seal, 0 ft to 80 ft
- 2" dia. sch. 40 PVC riser pipe, +2.5 ft to 86ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-4A

PROJECT: *Shenandoah Alternative Water Supply*

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
60					
	3-5-7-7	0	18"	26	SAND: med dk gray, vf-f, some silt, m-c layer w/ little vf and silt 13"-15", grading into finer sand w/ silt
62					
	11-10-14-15	0	14"	27	SAND: med dk gray, vf-f, some silt, occ. m sand lamination, cohesive
64					
	12-12-12-12	0	11"	28	SAND: med dk gray, vf-f some silt, m-c w/ some f layer 7"-9", pred vf sand below
66					
	3-4-3-4	0	13"	29	SILTY SAND: med dk gray, vf-f, silty, homogeneous, sl. plastic, cohesive
68					
	4-5-6-8	0	17"	30	SAND: med dk gray, pred. f w/ vf, some m, laminated, little silt, cohesive
70					
	WOR/1'-1-3	0	7"	31	SILTY SAND: med dk gray to olive gray, vf-f with silt, faintly laminated, sl plastic, cohesive
72					
	4-5-8-6	0	16"	32	SILTY SAND: med dk gray to olive gray, vf-f with silt, occ f sand laminations, sl plastic, cohesive
74					
	8-9-10-13	0	13"	33	SILTY SAND: med dk gray to olive gray, vf-f with silt, occ f sand laminations, sl plastic, cohesive
76					
	WOH/1.5'-1	0	12"	34	SILTY SAND: med dk gray to olive gray, vf-f with silt, occ f sand laminations, sl plastic, cohesive
78					
	2-3-2-5	0	18"	35	SILTY SAND: med dk gray to olive gray, vf-f with silt, occ f sand laminations, tr clay lams, some cross lamination, sl plastic, cohesive
80	7-5-4-18	0	13"	36	
					SILT, SAND & GRAVEL: olive gray, silt and vf-c w/ vc sand, with f-m SA-R gravel of various lithologies, cohesive
82	16-14-9-50/5"	0	16"	37	
84					SAND & GRAVEL: cobbly at top, vf-vc sand with f-m SA-R gravel, some silt, flowing
	NQ Core 83 ft -88 ft	0	9"	R-1	
86					
88					SAND & GRAVEL: no recovery - suspect loose sand and gravel
	26-13-8-7	0	0"	38	
90					SAND & GRAVEL: loose, relatively clean, vf-vc sand w/ f A-SR gravel of various lithologies
	12-12-12-8	0	1"	39	
92					SAND & GRAVEL: no recovery - suspect loose sand and gravel
	3-8-6-6	0	0"	40	
94					

WELL CONSTRUCTION DETAILS:

- 6" dia. borehole, 0 ft to 120 ft
- Bentonite slurry annular seal, 0 ft to 80 ft
- 2" dia. sch. 40 PVC riser pipe, +2.5 ft to 86ft
- Bentonite chip annular seal, 80 ft to 84 ft
- #1 grade sand, 84 ft to 119.5 ft
- 2" dia. 20-slot PVC screen, 86 ft to 118 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-4A

PROJECT: *Shenandoah Alternative Water Supply*

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION
	3-4-4-5	0	11"	41	SAND & GRAVEL: loose, pred m-vc, some vf-f, tr. silt, w/ f SA-SR gravel of various lithologies, more silt and
96					
	3-5-7-4	0	10"	42	SAND & GRAVEL: as above with less silt, cohesive to loose, occ. large pebble up to 1.5", pred m-vc sand
98					
	10-13-18-10	0	5"	43	SAND & GRAVEL: as above, pred m-vc sand and f-m gravel
100					
	8-12-17-29	0	20"	44	SILT, SAND & GRAVEL: m-vc sand w/ vf-f, silty, w/ f-m SA-SR gravel, layering in sands, cohesive to crumbly
102					
	28-54-50/2"	0	14"	45	SAND: olive gray, vf-f some silt, w/ layers of m-vc sand w/ f SR gravel, cohesive
104					SAND & GRAVEL: loose, few fines, cobbly at bottom (?)
	11-25-50/4"	0	8"	46	
106					
	NQ Core 105.5 -108 ft	0	0"	R-2	SAND & GRAVEL: no recovery - suspect loose sand and gravel
108					
	70-55-93-83	0	19"	47	SAND & GRAVEL: dk gray to olive gray, m-vc sand , some vf-f, w/ f-m SR-R gravel of various lithologies, tr. silt, cohesive, pred. f-m sand @ 4"-7", laminated vf sand and silt layer at bottom
110					
	100/5"	0	5"	48	SAND & GRAVEL: as above, with laminated silt and vf sand top 1"
112					
	68-72-78-100/4"	0	18"	49	SAND & GRAVEL: dk gray to olive gray, m-vc w/ f-m SR-R gravel, less silt than above, layers of f-vc sand
114					
	34-43-57-77	0	16"	50	SAND & GRAVEL: pred. c-vc w/ m sand, some vf-f, w/ abundant f-m SR-R gravel, cohesive
116					
	56-68-100/4"	0	16"	51	SAND & GRAVEL: massive, c-vc w/ m sand, some vf-f, w/ f SA-R gravel
118					
	100-132	0	10"	52	SILT, SAND & GRAVEL: olive gray, silt w/ vf sand, some f-vc, some SA-SR gravel, occ. A-SA dolostone frags, very dense, cohesive, moist to wet
120					
	130	0	1"	53	SILT, SAND & GRAVEL: as above, tr clay, dolostone cobble at bottom, dense
122					
	NQ Core 120.5 - 123 ft		6"	R-3	
124					SILT, SAND & GRAVEL: olive gray, silt w/ vf-f sand, tr. clay, some m-vc, w/ f-m A-SR gravel, pred dolostone clasts, dense, stiff
126	NQ Core 123 ft- 128 ft		22"	R-4	
128					
					SILT, SAND & GRAVEL: as above, cobble at bottom

WELL CONSTRUCTION DETAILS:

- 6" dia. borehole, 0 ft to 120 ft
- #1 grade sand, 84 ft to 119.5 ft
- 2" dia. 20-slot PVC screen, 86 ft to 118 ft
- 2" bottom cap
- Collapsed Formation, 119.5 to 120 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-4A

PROJECT: *Shenandoah Alternative Water Supply*

DEPTH FEET	BLOW COUNTS	PID (ppm)	RECOV.	SAMP. #	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
130							130		
	NQ Core 128 ft - 133 ft		7"	R-5					
132							132		
					SILT, SAND & GRAVEL: as above, cobbly & bouldery				
134							134		
136	NQ Core 133 ft -138 ft		18"	R-6			136		
138					SILT, SAND & GRAVEL: no recovery, probably less cohesive material		138		
140							140		
	NQ Core 138 ft - 143 ft		0"	R-7					
142							142		Total depth: 143 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-4AD

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.10.0203*
LOGGED BY: *S. Fisher*
DATES DRILLED: *2/20/03 - 2/27/03*

DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *Ed Funk*
RIG TYPE: *Bucyrus Erie W-22*
DRILLING METHOD: *Cable Tool*
DEVELOPMENT DATE: *2/28/03, 4/15/03 - 4/16/03*
LOCATION: *Approx. 10 ft NE of TW-4A*

NOTES: See TW-4A well log for soil details
Ground surface elevation: 253.39 ft amsl
SWL = 7.90' below TOC, 2/28/03

CASING RIM ELEVATION: 257.16 ft amsl
NORTHING: 993,005.135 EASTING: 684,087.800

DEPTH FEET	COM. BLOWS/ YIELD	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
0			SAND & GRAVEL: dk yellowish brown (10 YR 4/2) f-vc sand with f-m SA-R gravel, loose		0		6" locking well cap
			SAND & SILT: olive gray (5 Y 4/1) vf-f sand with silt, occ. thin gravel zone near top, wet				
10					10		
20					20		
30					30		
40					40		
50					50		6" dia.steel casing with driveshoe, +2.5' to 107'
60					60		
70					70		
80			SILT, SAND & GRAVEL: silty, olive gray f-vc sand and f-m SA-R gravel		80		
			SAND & GRAVEL: olive gray f-vc sand and f-m gravel, water-bearing				
90					90		
100			SILT, SAND & GRAVEL: silty, olive gray f-vc sand and f-m SA-SR gravel, cohesive		100		
			SAND: olive gray, vf-f some silt, w/ layers of m-vc sand w/ f SR gravel, cohesive				5" x 6" neoprene K-packer
110			SAND & GRAVEL: loose to cohesive, m-vc sand, some vf-f, with f-m SA-R gravel., stratified		110		Nominal 5" dia. 304 SS 60-slot V-wire telescoping screen, 107' - 118'
120			SILT, SAND & GRAVEL: olive gray, silt, sand & SA-SR gravel, occ. A-SA dolostone frags, very dense		120		Nominal 5" dia. SS sump.

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-4AS

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.10.0203*
LOGGED BY: *S. Fisher*
DATES DRILLED: *12/11/02 - 12/20/02, 2/12/03*

DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *K. Weigle/ Ed Funk*
RIG TYPE: *IR T4W & BE W-22*
DRILLING METHOD: *Air Rotary & Cable Tool*
DEVELOPMENT DATE: *2/12/03 - 2/14/03*
LOCATION: *Approx. 15 ft north of TW-4A*

NOTES: See TW-4A well log for soil details
Well deepened & screen reinstalled on 2/12/03
SWL = 8.50' below TOC, 2/14/03

CASING RIM ELEVATION: 257.06 ft amsl
NORTHING: 993,011.650 EASTING: 684,083.914

DEPTH FEET	CUM. BLOWS YIELD	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
0			SAND & GRAVEL: dk yellowish brown (10 YR 4/2) f-vc sand with f-m SA-R gravel, loose		0		8" locking well cap
			SAND & SILT: olive gray (5 Y 4/1) vf-f sand with silt, occ. thin gravel zone near top, wet				
10					10		
20					20		
30					30		
40					40		8" dia.steel casing, +2.5' to 86'
50					50		
60					60		
70					70		
80			SILT, SAND & GRAVEL: silty, olive gray f-vc sand and f-m SA-R gravel		80		6" x 8" neoprene K-packer
			SAND & GRAVEL: olive gray f-vc sand and f-m gravel, water-bearing				
90					90		Nominal 6" dia. 304 SS 100-slot V-wire telescoping screen, 86'-100'
100			SILT, SAND & GRAVEL: silty, olive gray f-vc sand and f-m SA-SR gravel, cohesive		100		Nominal 6" dia. SS sump, 100'-105'
			SAND: olive gray, vf-f some silt, w/ layers of m-vc sand w/ f SR gravel, cohesive				
			SAND & GRAVEL: loose, few fines				

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-5

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.10.0203*
LOGGED BY: *J. Taylor/E. Stoner/S. Fisher*
DATES DRILLED: *2/4/03 - 3/19/03*

NOTES: Hole drilled by mud rotary method, 195' to 391'
Blown yield >400 gpm
SWL = 15.4' below TOC, 4/10/03

DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *K. Weigle/C. Knaub*
RIG TYPE: *IR T4W*
DRILLING METHOD: *Air Rotary*
DEVELOPMENT DATE: *3/19/03 - 3/21/03*
LOCATION: *15 ft east of TW-3A*

CASING RIM ELEVATION: 266.06 ft amsl
NORTHING: 993,943.364 EASTING: 684,275.758

DEPTH FEET	CUM. BLOWN YIELD	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
0			SAND & GRAVEL: dk yellowish brown (10 YR 4/2) f-vc sand with f-m SA-R gravel, loose, wet at 15 feet		0		8" locking well cap
10					10		
20			SAND & SILT: olive gray (5 Y 4/1) vf-f sand with silt, wet		20		
30					30		12" dia. steel casing with driveshoe, 0.5' to 195'
40					40		
50					50		
60					60		Bentonite slurry annular seal, 0' to 391'
70			SAND & GRAVEL: olive gray f-vc sand and f-m SA-R gravel		70		
80					80		
90					90		
100					100		8" dia.steel casing with driveshoe, +2.5' to 391'
110			SILT, SAND & GRAVEL: olive gray vf-m sand with A-SR f-m gravel, predominantly dolostone frags		110		

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-5

DEPTH FEET	BLOWN YIELD (GPM)	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
120					120		
130					130		
140					140		12" dia. steel casing with driveshoe, 0.5' to 195'
150					150		
160			FRACTURED DOLOSTONE: dark yellowish orange (10 YR 6/6) weathered sandy dolostone, some greenish gray(5 G 4/1) dolostone, some quartz, fractured		160		
170	> 200 gpm				170		8" dia.steel casing with driveshoe, +2.5' to 391'
180					180		
			DOLOSTONE: dark greenish gray, more competent				
190			FRACTURED DOLOSTONE: dark yellowish orange, weathered		190		
			DOLOSTONE: competent, dark, unfractured				
200			FRACTURED DOLOSTONE: soft, broken, weathered		200		
			VOID: open with some silt, sand, and weathered rock frags, water-bearing				
210					210		10" dia. borehole, 195' to 391'
			FRACTURED DOLOSTONE: broken, massive to fissile, some weathering, some quartz, tr slickensides				
220					220		
230					230		
240			DOLOSTONE: competent interval		240		Bentonite slurry annular seal, 0' to 391'
			DOLOSTONE: very hard, competent				
			FRACTURED DOLOSTONE: softer, broken, some orange discharge				
250					250		
			VOID: open, w/ some weathered debris, water-bearing				
260			DOLOSTONE: dark gray (N3) to medium dark gray (N4), competent		260		
			DOLOSTONE: more competent				
			FRACTURED DOLOSTONE: broken				

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-5

DEPTH FEET	BLOWN YIELD (GPM)	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
270					270		
			VOID: open interval w/ silt and sand, weathered rock frags, water-bearing				
			DOLOSTONE: more competent				
280			DOLOSTONE: competent		280		
			FRACTURED DOLOSTONE: softer, broken				
290			VOID: soft, w/ silt, sand, and weathered rock debris, water-bearing		290		
			DOLOSTONE: fractured				
300			FRACTURED DOLOSTONE: softer, broken		300		10" dia. borehole, 195' to 391'
			FRACTURED DOLOSTONE: weathered				
			FRACTURED DOLOSTONE: alternating thin layers of competent and weathered rock				
310			DOLOSTONE: soft, less fractured		310		
			DOLOSTONE: more competent				
320			FRACTURED DOLOSTONE: soft, broken		320		
			DOLOSTONE: more competent				
			FRACTURED DOLOSTONE: soft, broken				
330			DOLOSTONE: more competent		330		
			VOID: some silt, sand, and weathered rock debris, water-bearing				
340			FRACTURED DOLOSTONE: soft, broken		340		Bentonite slurry annular seal, 0' to 391'
			DOLOSTONE: more competent				
			FRACTURED DOLOSTONE: weathered, broken				
350			DOLOSTONE: competent		350		
			VOID: some silt, sand, weathered rock debris				
			FRACTURED DOLOSTONE: weathered, broken				
360			DOLOSTONE: competent		360		
			VOID				
370			DOLOSTONE: competent		370		8" dia.steel casing with driveshoe, +2.5' to 391'
380					380		
			FRACTURED DOLOSTONE: weathered, broken				
			DOLOSTONE: competent				
390					390		
	1 gpm		DOLOSTONE: yellowish gray (5 Y 8/1) to lt olive gray (5 Y 6/1) sandy dolostone, competent, some fracturing, tr iron staining/mottling, some med dk gray (N4) below 295', some calcite veining				
400	>400 gpm		FRACTURED DOLOSTONE: broken, with some grayish orange (10 YR 6/6) silt, sand, and weathered rock debris, iron-stained, tr. quartz, water-bearing		400		7.5" dia. borehole, 391' to 403'
			DOLOSTONE: yellowish gray to lt olive gray sandy dolostone, competent				

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-5A

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.10.0203*
LOGGED BY: *S. Fisher*
DATES DRILLED: *11/1/02- 11/21/02*

DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *K. Weigle*
RIG TYPE: *IR T4W*
DRILLING METHOD: *Air Rotary*
DEVELOPMENT DATE: *11/21/02*
LOCATION: *15 ft southeast of TW-3A*

NOTES: Well terminated at 320 ft - difficult drilling conditions
Ground surface elevation: 263.19 ft amsl

CASING RIM ELEVATION: 265.29 ft amsl
NORTHING: 993,943.091 EASTING: 684,279.037

DEPTH FEET	CUM. BLOWN YIELD	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
0			SAND & GRAVEL: dk yellowish brown (10 YR 4/2) f-vc sand with f-m SA-R gravel, loose, wet at 15 feet		0		10" locking well cap
10					10		
20			SAND & SILT: olive gray (5 Y 4/1) vf-f sand with silt, wet		20		
30					30		10" dia. steel casing with driveshoe, 2.0' to 208'
40					40		
50					50		
60					60		
			SAND & GRAVEL: olive gray f-vc sand and f-m SA-R gravel				
70					70		
80					80		

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-5A

DEPTH FEET	BLOWN YIELD (GPM)	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
100					100		
			SILT, SAND & GRAVEL: olive gray vf-m sand with A-SR f-m gravel, predominantly dolostone frags				
110					110		10" dia. steel casing with driveshoe, 2.0' to 208'
120					120		
130					130		
140					140		
150					150		
			WEATHERED DOLOSTONE: grayish orange (10 YR 7/4) weathered sandy dolostone with silt, sand and weathered rock frags, broken, water-bearing				
160					160		
170					170		
			DOLOSTONE: more competent, broken				
			WEATHERED DOLOSTONE: highly fractured zone with abundant weathered material including calcite mineral crusts, water-bearing				
180					180		
			DOLOSTONE: moderately competent, broken, with weathered material				
190					190		
			WEATHERED DOLOSTONE: soft zone with abundant silt, sand, and weathered rock frags, water-bearing				
200					200		
			DOLOSTONE: more competent but broken, with highly weathered layers containing silt, sand, and				

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-5A

DEPTH FEET	BLOWN YIELD (GPM)	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
210					210		10" dia. borehole, 208' to 215'
220					220		9" dia. borehole, 215' to 320'
			WEATHERED DOLOSTONE: soft zone with silt and sand top 1 foot, broken and weathered below, water-bearing				
			WEATHERED DOLOSTONE: moderately competent, broken, with soft weathered zones				
230			DOLOSTONE: dark to medium gray, more competent but broken, with occasional soft layers, water-bearing		230		Bentonite chip borehole seal, 221' to 320'
240	>300 gpm		DOLOSTONE: competent, hard, dark gray		240		
			WEATHERED DOLOSTONE: soft deeply weathered zone with silt, sand, and weathered rock frags., water-bearing				
250			DOLOSTONE: competent		250		
			WEATHERED DOLOSTONE: soft, deeply weathered with silt, sand, and weathered rock frags, water-bearing				
260			DOLOSTONE: lightly weathered, more competent but broken, water-bearing		260		
			DOLOSTONE: harder, dark gray, broken, some weathered zones				
270			DOLOSTONE: competent, hard, dark gray, some iron-stained fractures		270		
	330 gpm		DOLOSTONE: light gray, with iron-stained fractures, some weathered layers, water-bearing				
			WEATHERED DOLOSTONE: light gray, with weathered zones containing clay/silt some sand				
280			WEATHERED DOLOSTONE: broken, lt gray, with some clay/silt and weathered rock		280		
			WEATHERED DOLOSTONE: highly weathered and muddy with abundant calcite crusts, water-bearing				
290			DOLOSTONE: more competent, broken, some weathered material		290		
			DOLOSTONE: lt gray, more competent, fractured				
300			WEATHERED DOLOSTONE: softer, lt gray, with weathered material and calcite crusts, water-bearing		300		
			DOLOSTONE: dark gray, more competent with some weathered material				
310			WEATHERED DOLOSTONE: soft, weathered, water-bearing		310		
			DOLOSTONE: more competent, but broken, sandy, water-bearing				
320	>400 gpm				320		

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-6

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.10.0203*
LOGGED BY: *S. Fisher*
DATES DRILLED: *10/17/02-10/31/02*

DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *K. Weigle*
RIG TYPE: *1R T4W*
DRILLING METHOD: *Air Rotary*
DEVELOPMENT DATE: *10/31/02*
LOCATION: *45 ft north of TW-4A*

NOTES: Drilling terminated due to incompetent borehole
Ground surface elevation: 254.66 ft amsl

CASING RIM ELEVATION: 257.19 ft amsl
NORTHING: 993,042.852 EASTING: 684,085.824

DEPTH FEET	CUM. BLOWN YIELD	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
0			SAND & GRAVEL: dk yellowish brown, loose		0		6-inch dia. locking well cap
			SAND & SILT: olive gray to dk gray				
10					10		
20					20		
			SAND: trace of gravel				
			SAND & SILT: dk gray, vf sand with silt				
30					30		10" dia. steel casing with driveshoe, 1' to 283'
40					40		
50					50		
60					60		6" dia.steel casing with driveshoe, +2.5' to 290'
70					70		

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-6

DEPTH FEET	BLOWN YIELD (GPM)	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
80					80		
			SAND & GRAVEL: olive gray, fine to coarse sand and fine to coarse gravel				
90					90		10" dia. steel casing with driveshoe, 1' to 283'
100					100		
110					110		
120					120		6" dia.steel casing with driveshoe, +2.5' to 290'
			SILT, SAND & GRAVEL: olive gray, dense, silt with vf-vc sand and A-SR gravel				
130					130		
140					140		
			SILT, SAND & GRAVEL: olive gray, dense, very gravelly				
150					150		
160					160		
			SILT, SAND & GRAVEL: olive gray, with increasing A-SA dolostone fragments				

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: TW-6

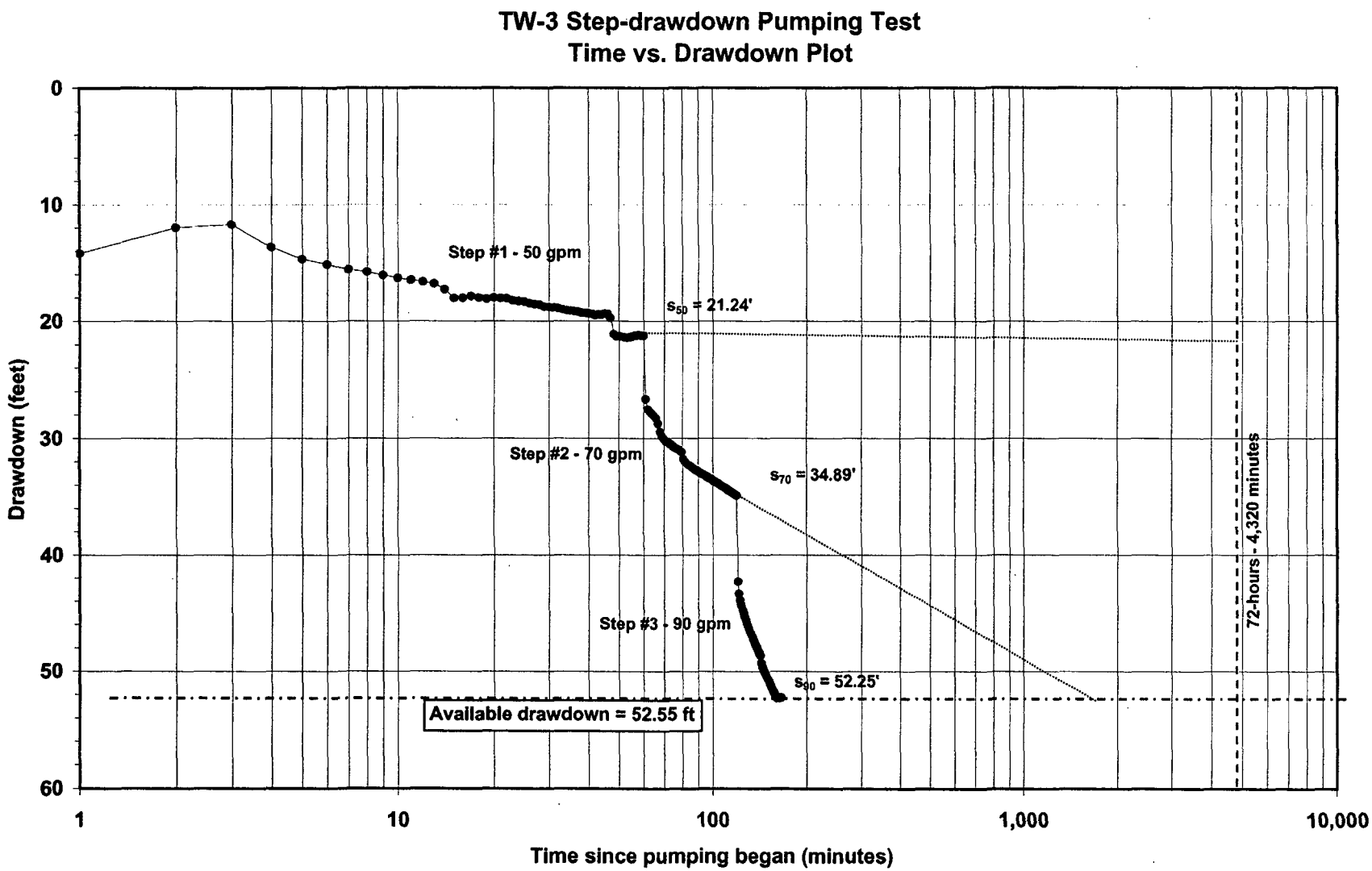
DEPTH FEET	BLOWN YIELD (GPM)	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
170					170		
180					180		10" dia. steel casing with driveshoe, 1' to 283'
190					190		
200			SILT, SAND & GRAVEL: olive gray to dark gray, gravelly and cobbly, clasts composed of quartzite, red shale, dolostone, and green phyllite		200		
210					210		
220					220		
230					230		6" dia.steel casing with driveshoe, +2.5' to 290'
240			DOLOSTONE: dk gray, competent, with some wthrd fractures		240		
	75 gpm		FRACTURED DOLOSTONE: soft, w/ yellowish orange silt, fine sand, and weathered dolostone frags., water-bearing				
250			DOLOSTONE: light gray to med gray, sandy dolostone, with wthrd fractures, some silt and sand		250		
			FRACTURED DOLOSTONE: soft, broken zone, with silt, sand, and wthrd rock frags, water-bearing				
260			DOLOSTONE: competent, tr wthrd material		260		

GROUNDWATER SCIENCES CORPORATION

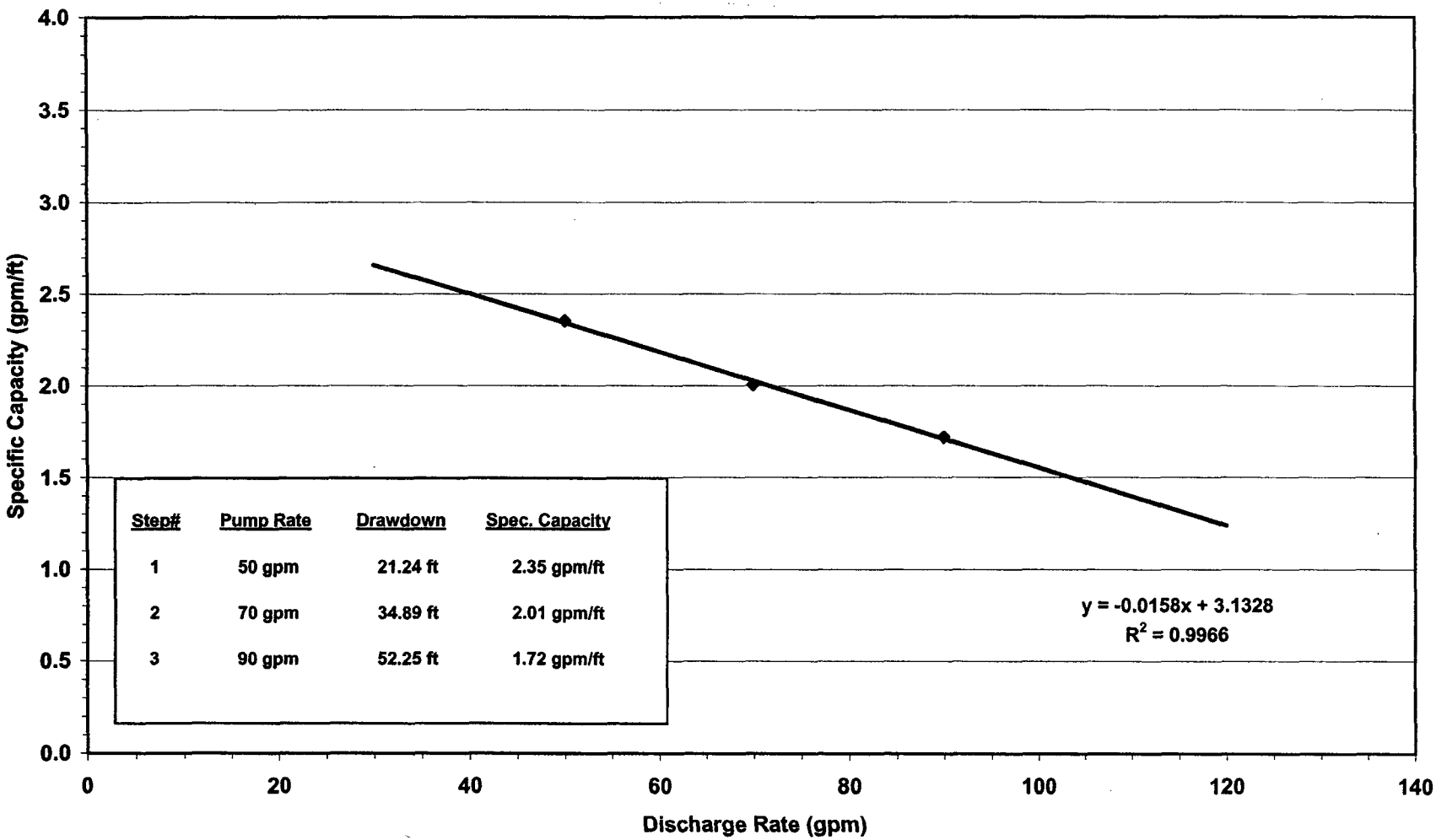
GEOLOGIC LOG: TW-6

DEPTH FEET	BLOWN YIELD (GPM)	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
	300 gpm		FRACTURED DOLOSTONE: soft, broken zone with wthrd material, water-bearing				
270			DOLOSTONE: more competent formation		270		10" dia. steel casing with driveshoe, 1' to 283'
			FRACTURED DOLOSTONE: soft, broken zone, water-bearing				
			DOLOSTONE: competent formation				6" dia.steel casing with driveshoe, +2.5' to 290'
280					280		Bentonite chip annular seal, 272' to 290'
			FRACTURED DOLOSTONE: soft, broken zone, water-bearing				
	300 gpm		DOLOSTONE: competent, with trace of wthrd fractures				9" dia. borehole, 283' to 290'
			FRACTURED DOLOSTONE: soft, broken, with some silt and sand, wthrd rock frags, water-bearing				
290	1 gpm		DOLOSTONE: dark gray (N3), competent		290		
			FRACTURED DOLOSTONE: soft, broken, with clay, silt, sand, and wthrd rock frags, abundant calcite mineral crust frags, water-bearing				
			DOLOSTONE: competent				
			FRACTURED DOLOSTONE: soft, broken, with wthrd material, water-bearing				
300	300 gpm		DOLOSTONE: more competent, but slightly weathered		300		6" dia. open borehole, 290' to 321'
			FRACTURED DOLOSTONE: broken, w/ wthrd material, water-bearing				
			DOLOSTONE: competent				
310			FRACTURED DOLOSTONE: broken, w/ wthrd material, water-bearing		310		
			DOLOSTONE: competent				
			FRACTURED DOLOSTONE: broken, w/ wthrd material, water-bearing				
			DOLOSTONE: competent				
320	>300 gpm		FRACTURED DOLOSTONE: soft, broken, with clay, silt, sand, and wthrd rock frags, abundant calcite mineral crust frags, water-bearing		320		
			DOLOSTONE: competent				

TW-3 Step-Drawdown Test Data

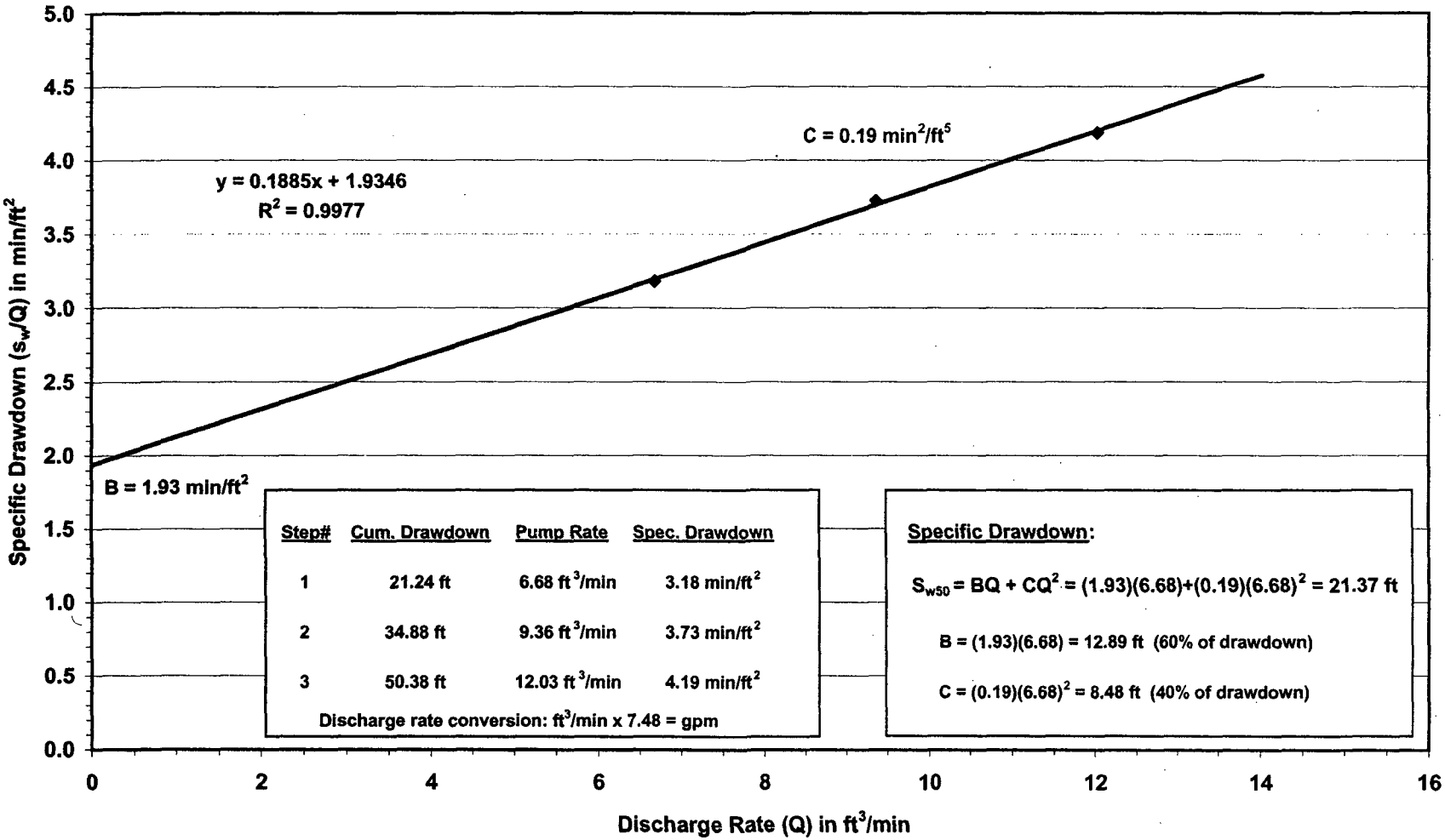

TW-3 Step-drawdown Pumping Test
Time vs. Drawdown Plot
Drawdown (feet)
0
10
20
30
40
50
60
Step #1 - 50 gpm
s_{50} = 21.24'
Step #2 - 70 gpm
s_{70} = 34.89'
Step #3 - 90 gpm
s_{90} = 52.25'
Available drawdown = 52.55 ft
72-hours - 4,320 minutes
1
10
100
1,000
10,000
Time since pumping began (minutes)

TW-3 Step-drawdown Pumping Test
Specific Capacity vs. Discharge Rate



Step#	Pump Rate	Drawdown	Spec. Capacity
1	50 gpm	21.24 ft	2.35 gpm/ft
2	70 gpm	34.89 ft	2.01 gpm/ft
3	90 gpm	52.25 ft	1.72 gpm/ft

TW-3 Step-drawdown Pumping Test
Hantush-Bierschenk Specific Drawdown Analysis



Step#	Cum. Drawdown	Pump Rate	Spec. Drawdown
1	21.24 ft	6.68 ft^3/min	3.18 min/ft^2
2	34.88 ft	9.36 ft^3/min	3.73 min/ft^2
3	50.38 ft	12.03 ft^3/min	4.19 min/ft^2

Discharge rate conversion: ft^3/min x 7.48 = gpm

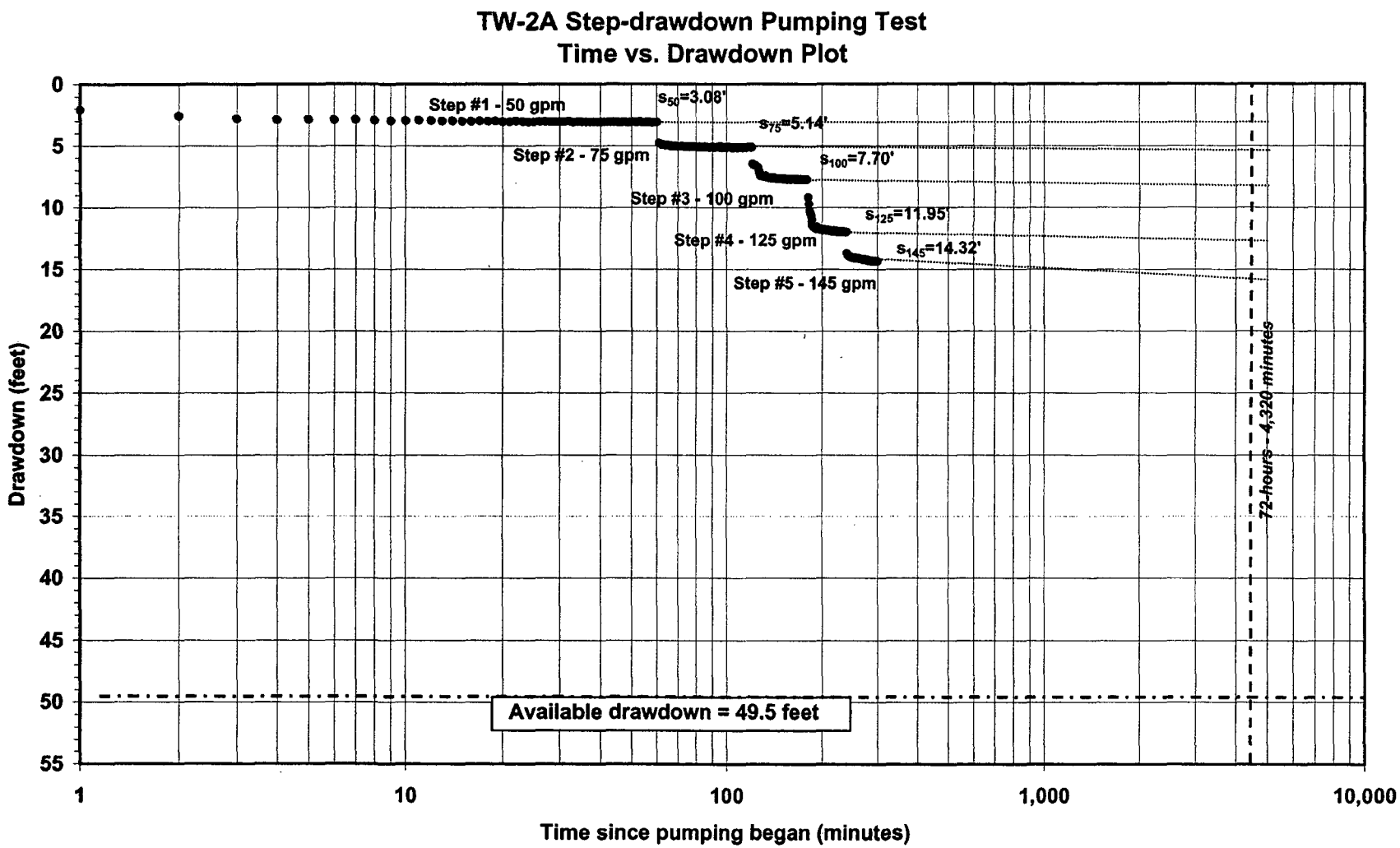
Specific Drawdown:

$S_{w50} = BQ + CQ^2 = (1.93)(6.68)+(0.19)(6.68)^2 = 21.37$ ft

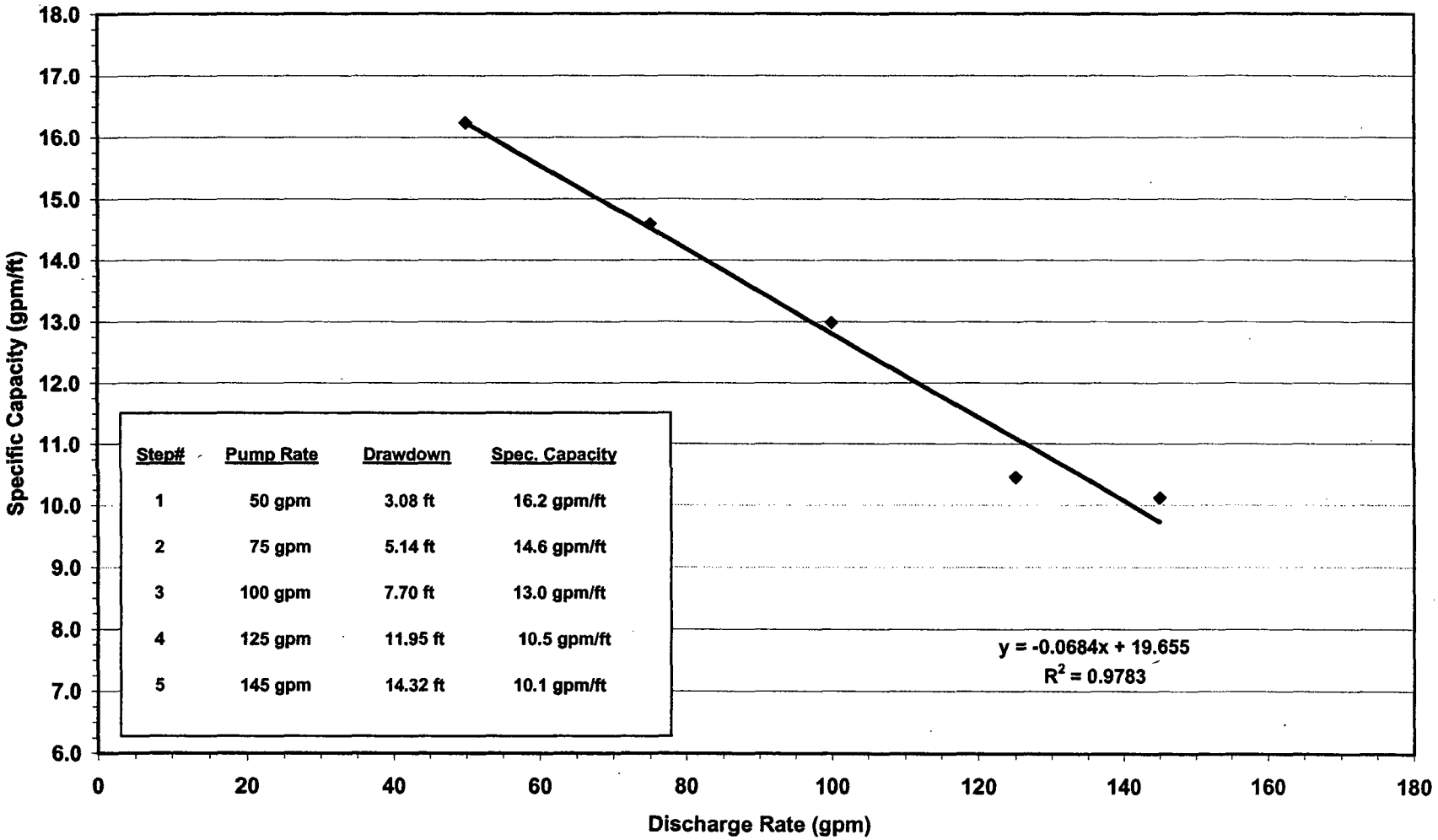
B = (1.93)(6.68) = 12.89 ft (60% of drawdown)

C = $(0.19)(6.68)^2$ = 8.48 ft (40% of drawdown)

TW-2A Step-Drawdown Test Data

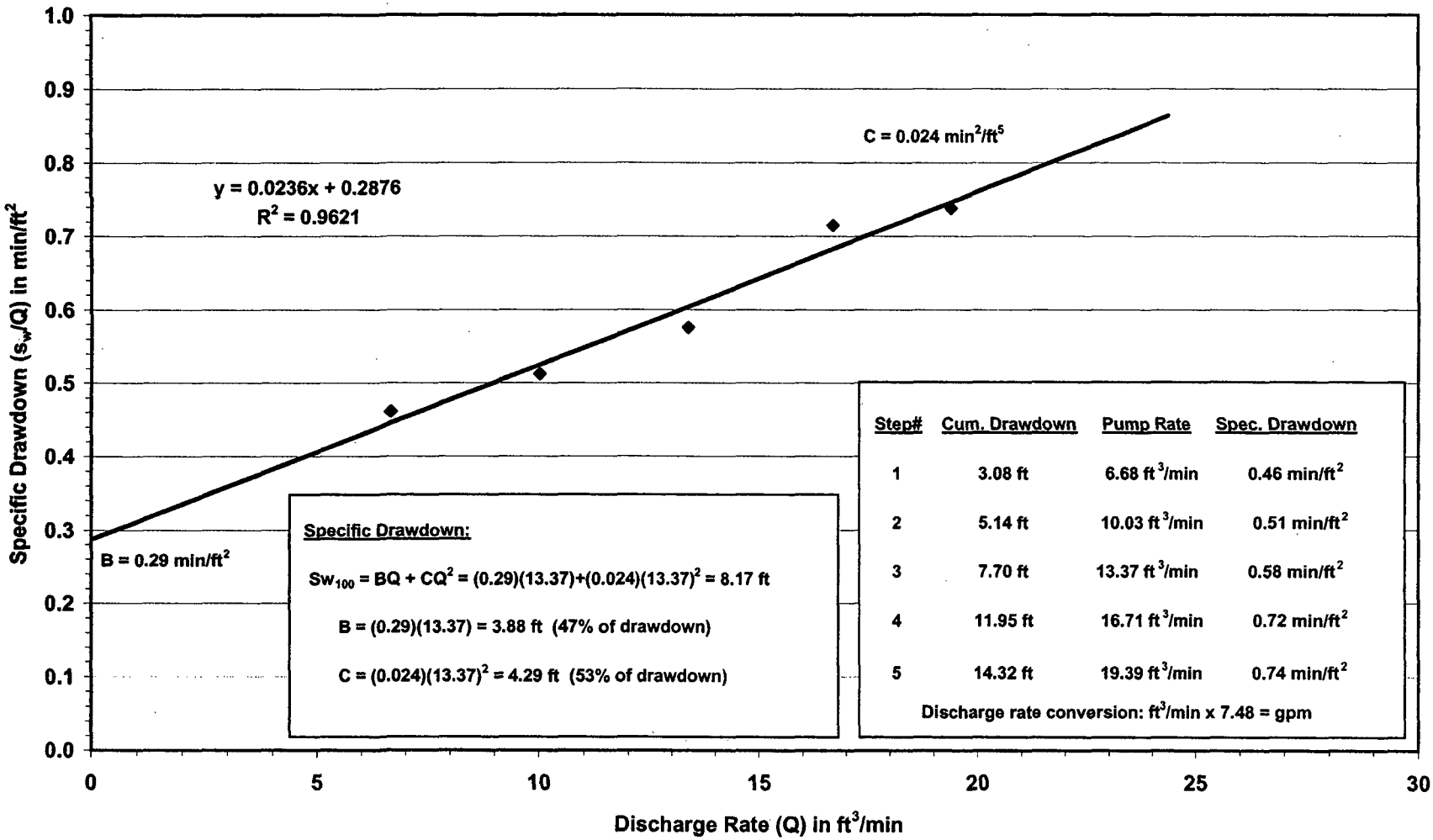

TW-2A Step-drawdown Pumping Test
Time vs. Drawdown Plot
Step #1 - 50 gpm
s_{50}=3.08'
s_{75}=5.14'
Step #2 - 75 gpm
s_{100}=7.70'
Step #3 - 100 gpm
s_{125}=11.95'
Step #4 - 125 gpm
s_{145}=14.32'
Step #5 - 145 gpm
72 hours - 4,320 minutes
Available drawdown = 49.5 feet
Drawdown (feet)
0
5
10
15
20
25
30
35
40
45
50
55
1
10
100
1,000
10,000
Time since pumping began (minutes)

TW-2A Step-drawdown Pumping Test
Specific Capacity vs. Discharge Rate



Step#	Pump Rate	Drawdown	Spec. Capacity
1	50 gpm	3.08 ft	16.2 gpm/ft
2	75 gpm	5.14 ft	14.6 gpm/ft
3	100 gpm	7.70 ft	13.0 gpm/ft
4	125 gpm	11.95 ft	10.5 gpm/ft
5	145 gpm	14.32 ft	10.1 gpm/ft

TW-2A Step-drawdown Pumping Test
Hantush-Bierschenk Specific Drawdown Analysis



Specific Drawdown:

$Sw_{100} = BQ + CQ^2 = (0.29)(13.37)+(0.024)(13.37)^2 = 8.17$ ft

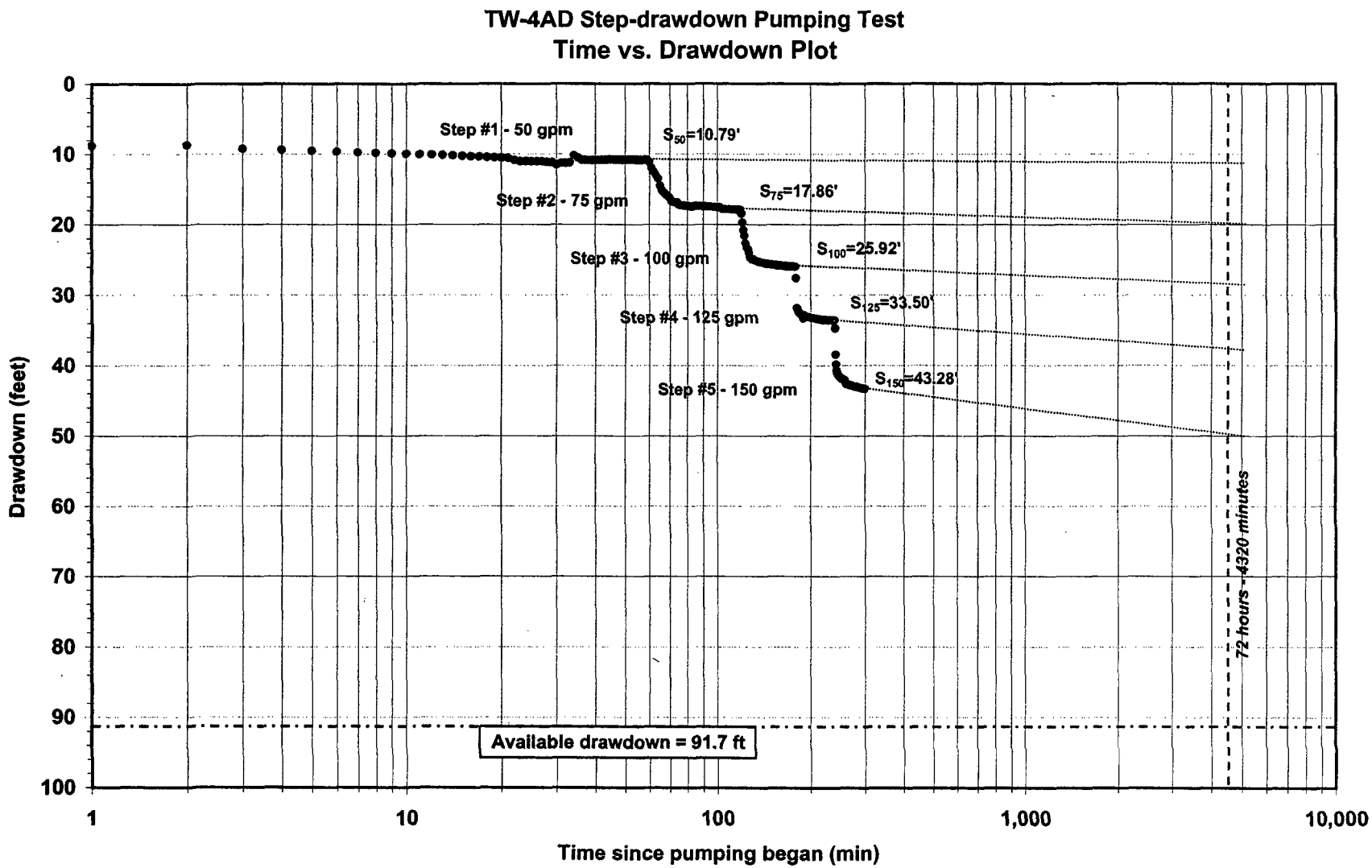
B = (0.29)(13.37) = 3.88 ft (47% of drawdown)

C = $(0.024)(13.37)^2$ = 4.29 ft (53% of drawdown)

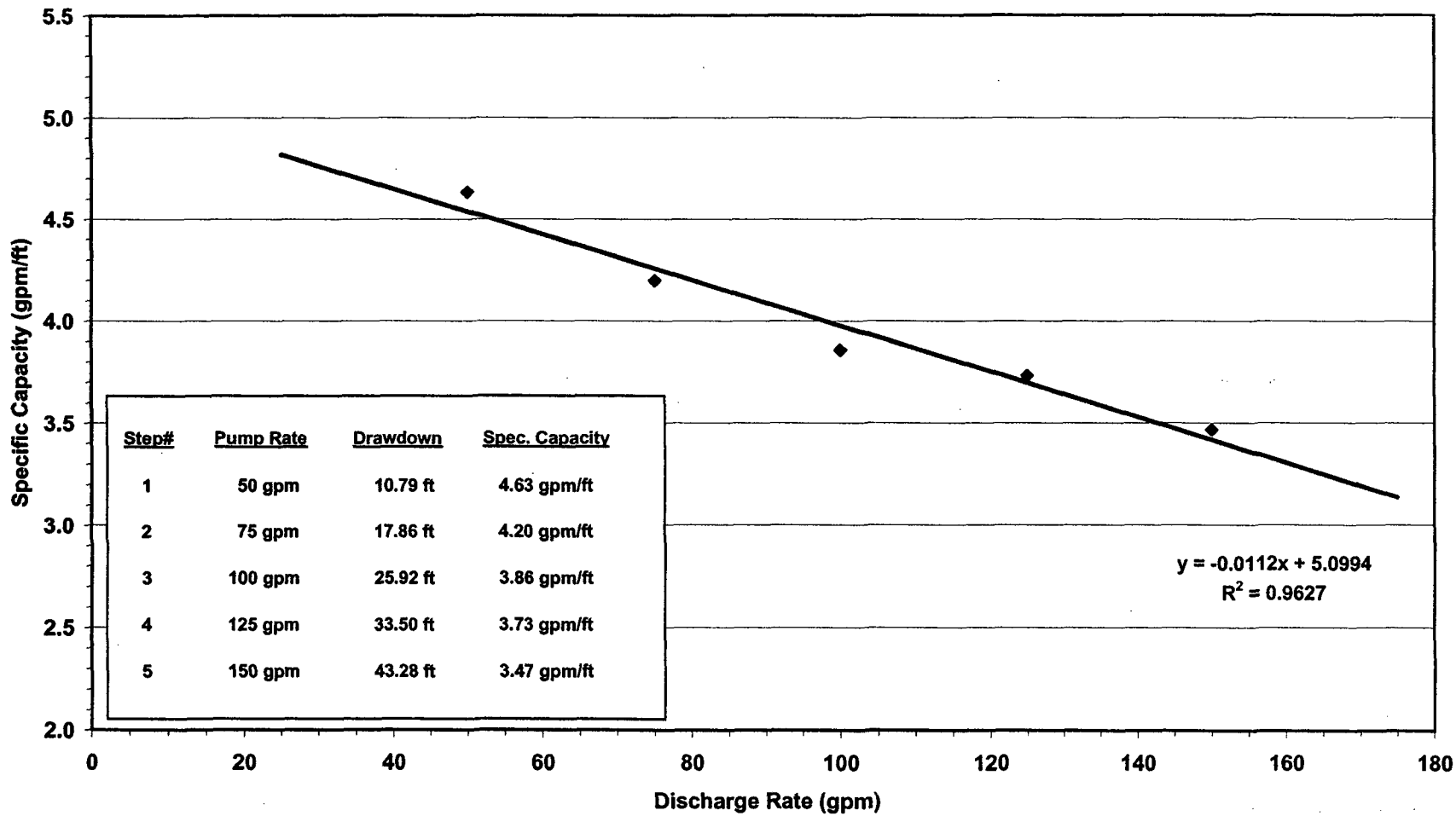
Step#	Cum. Drawdown	Pump Rate	Spec. Drawdown
1	3.08 ft	6.68 ft^3/min	0.46 min/ft^2
2	5.14 ft	10.03 ft^3/min	0.51 min/ft^2
3	7.70 ft	13.37 ft^3/min	0.58 min/ft^2
4	11.95 ft	16.71 ft^3/min	0.72 min/ft^2
5	14.32 ft	19.39 ft^3/min	0.74 min/ft^2

Discharge rate conversion: ft^3/min x 7.48 = gpm

TW-4AD Step-Drawdown Test Data

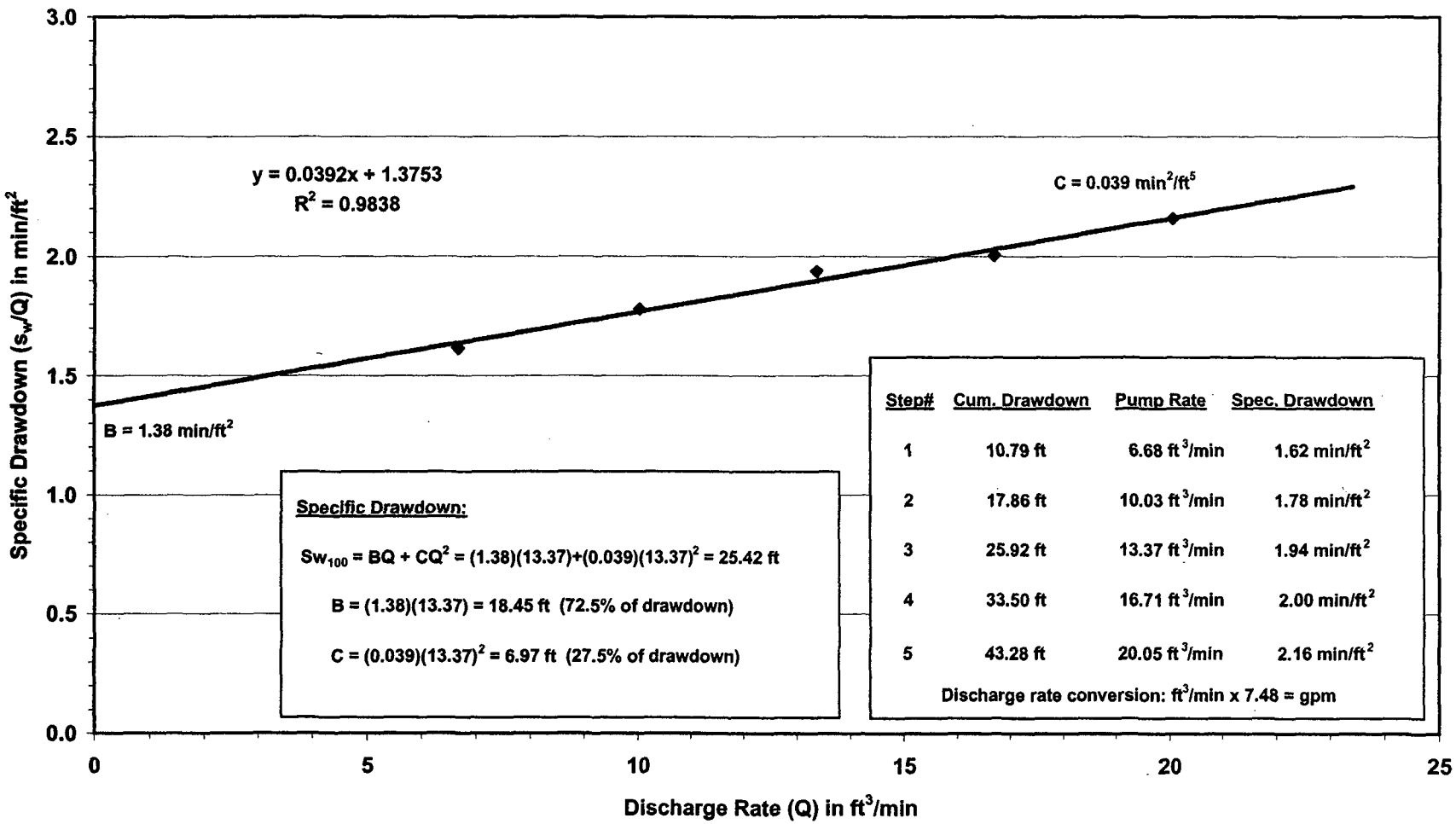

TW-4AD Step-drawdown Pumping Test
Time vs. Drawdown Plot
Drawdown (feet)
Time since pumping began (min)
Step #1 - 50 gpm
Step #2 - 75 gpm
Step #3 - 100 gpm
Step #4 - 125 gpm
Step #5 - 150 gpm
S50=10.79'
S75=17.86'
S100=25.92'
S125=33.50'
S150=43.28'
Available drawdown = 91.7 ft
72 hours - 4320 minutes
0
10
20
30
40
50
60
70
80
90
100
1
10
100
1,000
10,000

TW-4AD Step-drawdown Pumping Test
Specific Capacity vs. Discharge Rate



Step#	Pump Rate	Drawdown	Spec. Capacity
1	50 gpm	10.79 ft	4.63 gpm/ft
2	75 gpm	17.86 ft	4.20 gpm/ft
3	100 gpm	25.92 ft	3.86 gpm/ft
4	125 gpm	33.50 ft	3.73 gpm/ft
5	150 gpm	43.28 ft	3.47 gpm/ft

TW-4AD Step-drawdown Pumping Test
Hantush-Bierschenk Specific Drawdown Analysis



Specific Drawdown:

$Sw_{100} = BQ + CQ^2 = (1.38)(13.37)+(0.039)(13.37)^2 = 25.42$ ft

B = (1.38)(13.37) = 18.45 ft (72.5% of drawdown)

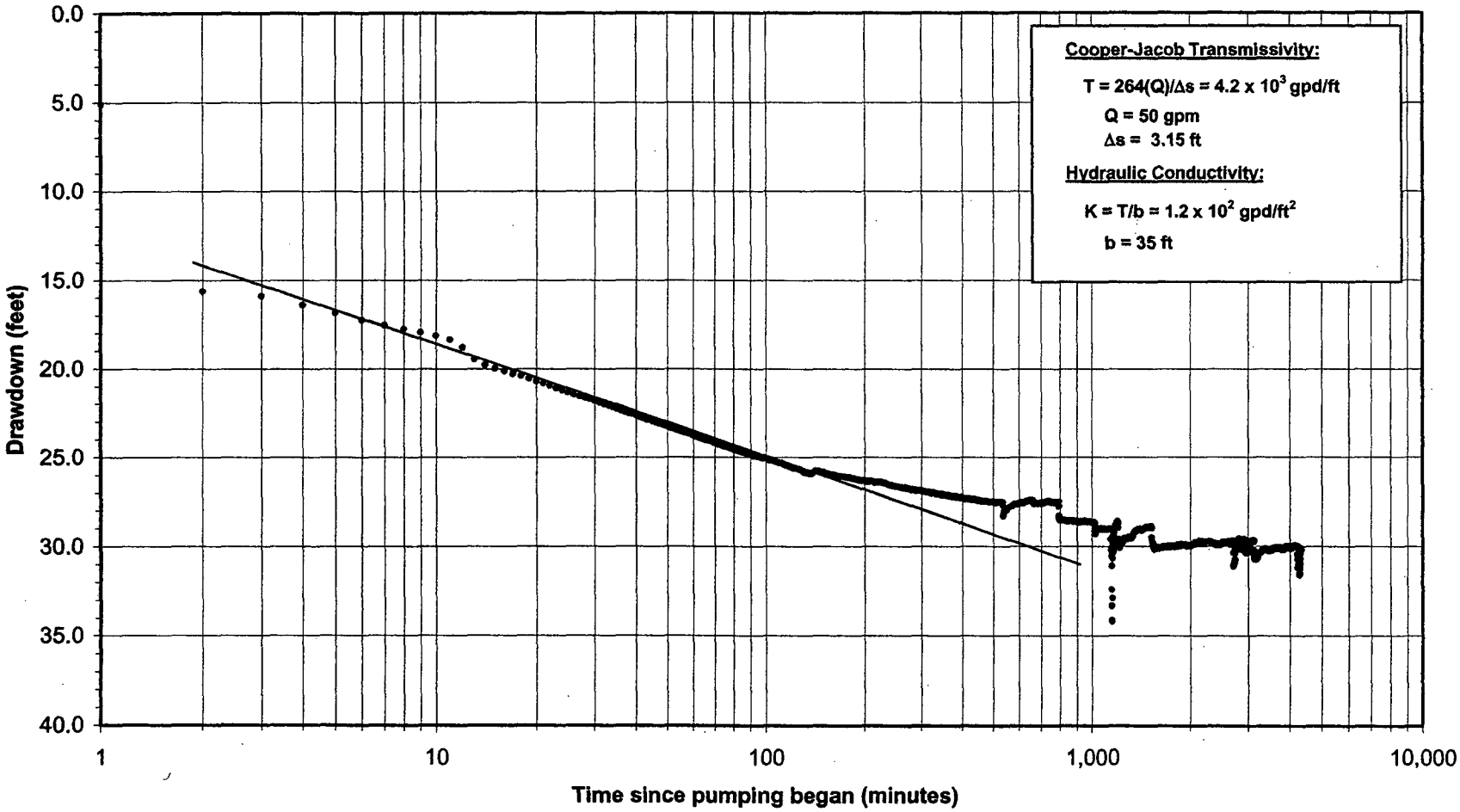
C = $(0.039)(13.37)^2$ = 6.97 ft (27.5% of drawdown)

Step#	Cum. Drawdown	Pump Rate	Spec. Drawdown
1	10.79 ft	6.68 ft^3/min	1.62 min/ft^2
2	17.86 ft	10.03 ft^3/min	1.78 min/ft^2
3	25.92 ft	13.37 ft^3/min	1.94 min/ft^2
4	33.50 ft	16.71 ft^3/min	2.00 min/ft^2
5	43.28 ft	20.05 ft^3/min	2.16 min/ft^2

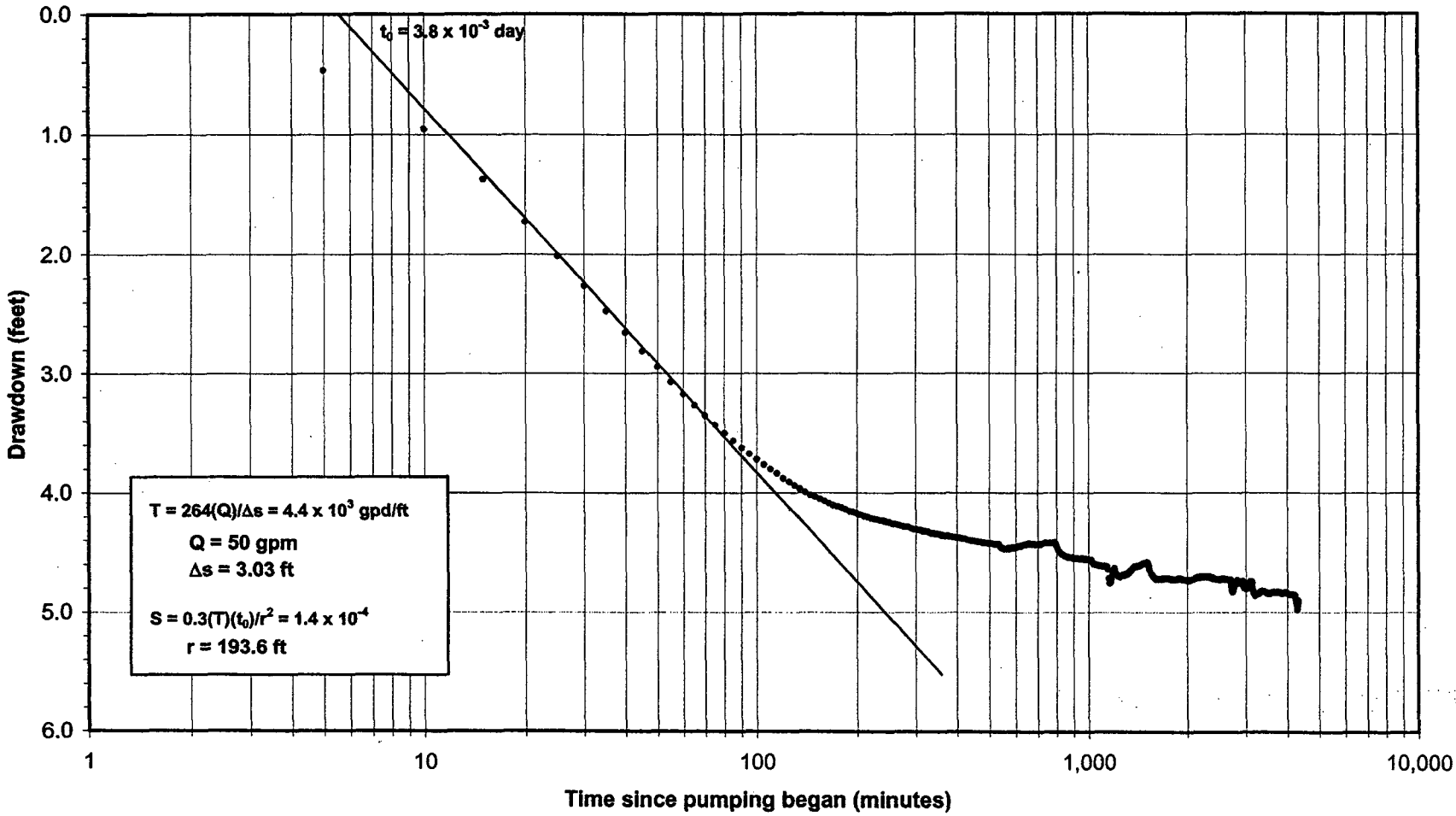
Discharge rate conversion: ft^3/min x 7.48 = gpm

TW-3 72 Hour Constant-Rate Pumping Test Data

TW-3 72-Hour Constant-rate Pumping Test
Test Well TW-3
time vs. drawdown

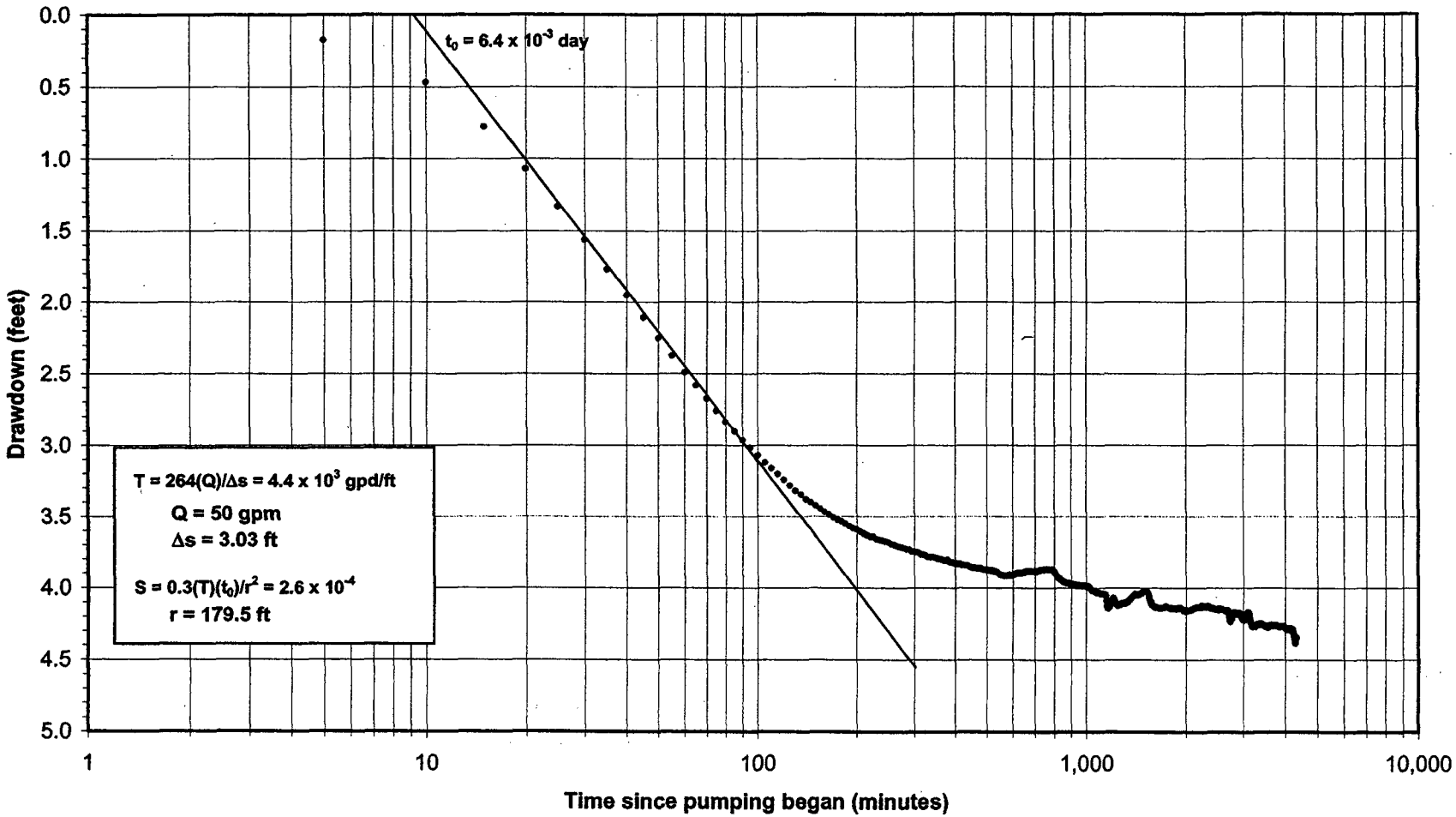


TW-3 72-Hour Constant-rate Pumping Test
Observation Well TW-3S
time vs. drawdown

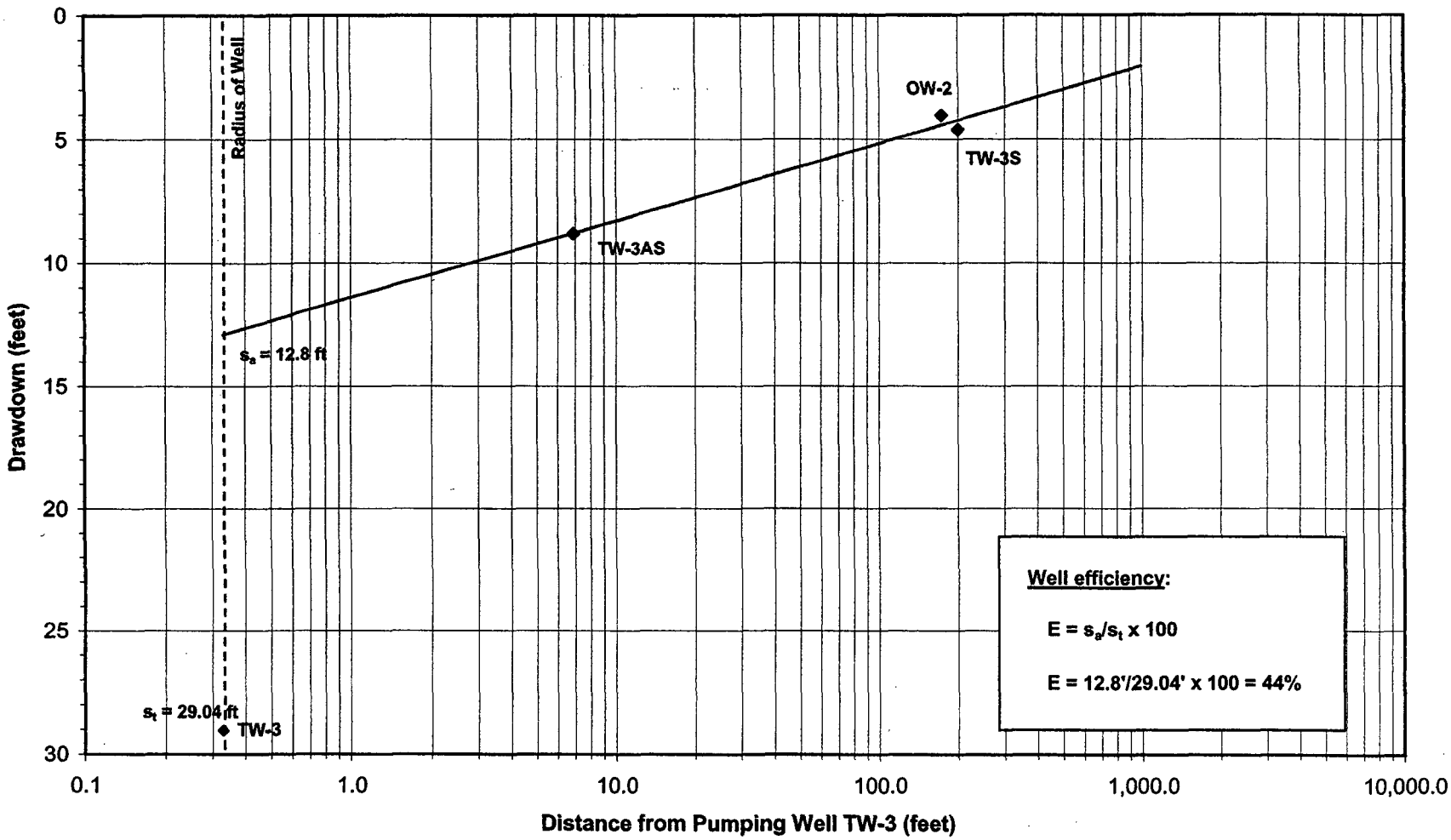


TW-3 72-Hour Constant-rate Pumping Test
Observation Well OW-2

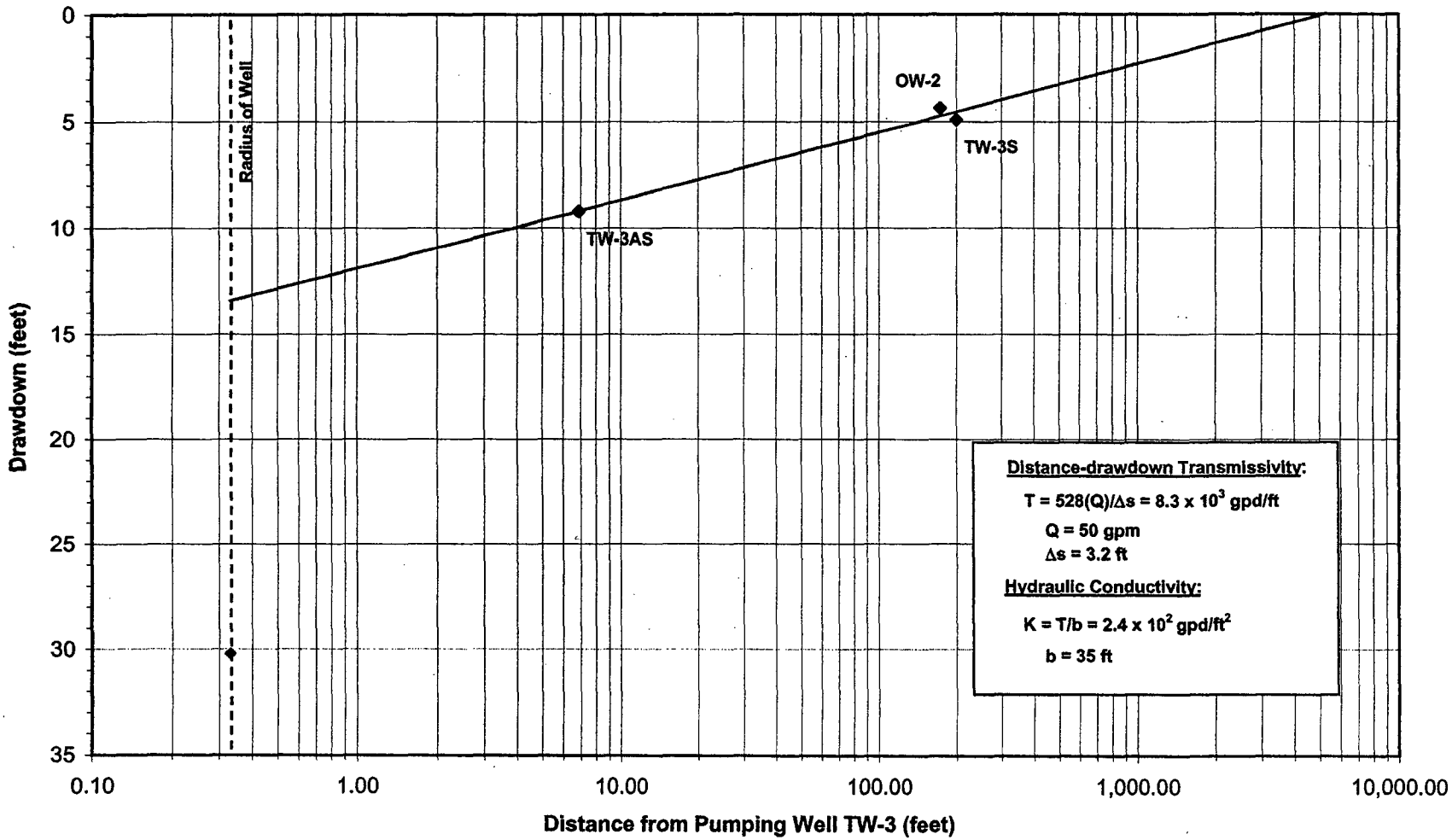
time vs. drawdown



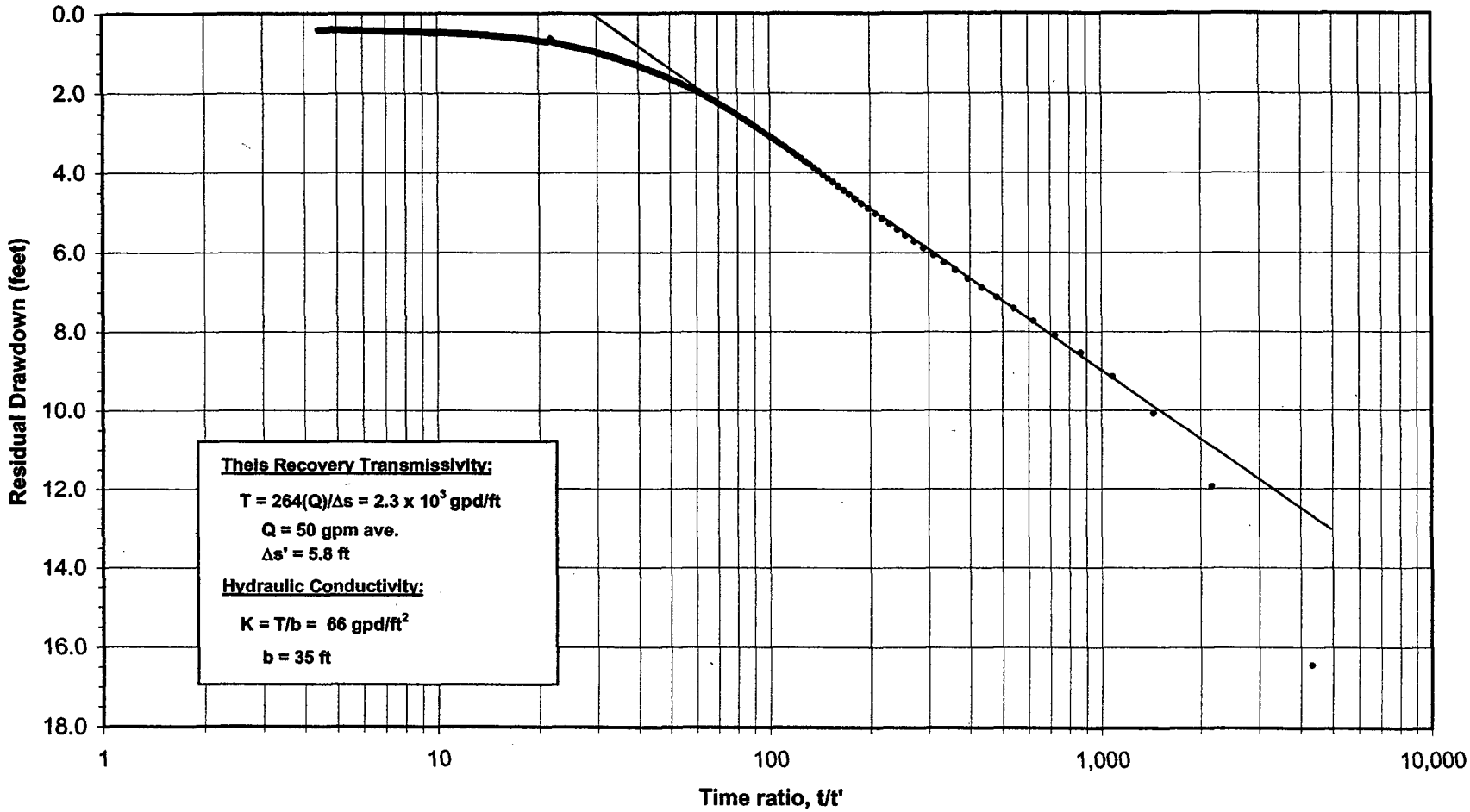
TW-3 72-Hour Constant-rate Pumping Test
24-Hour Distance-drawdown

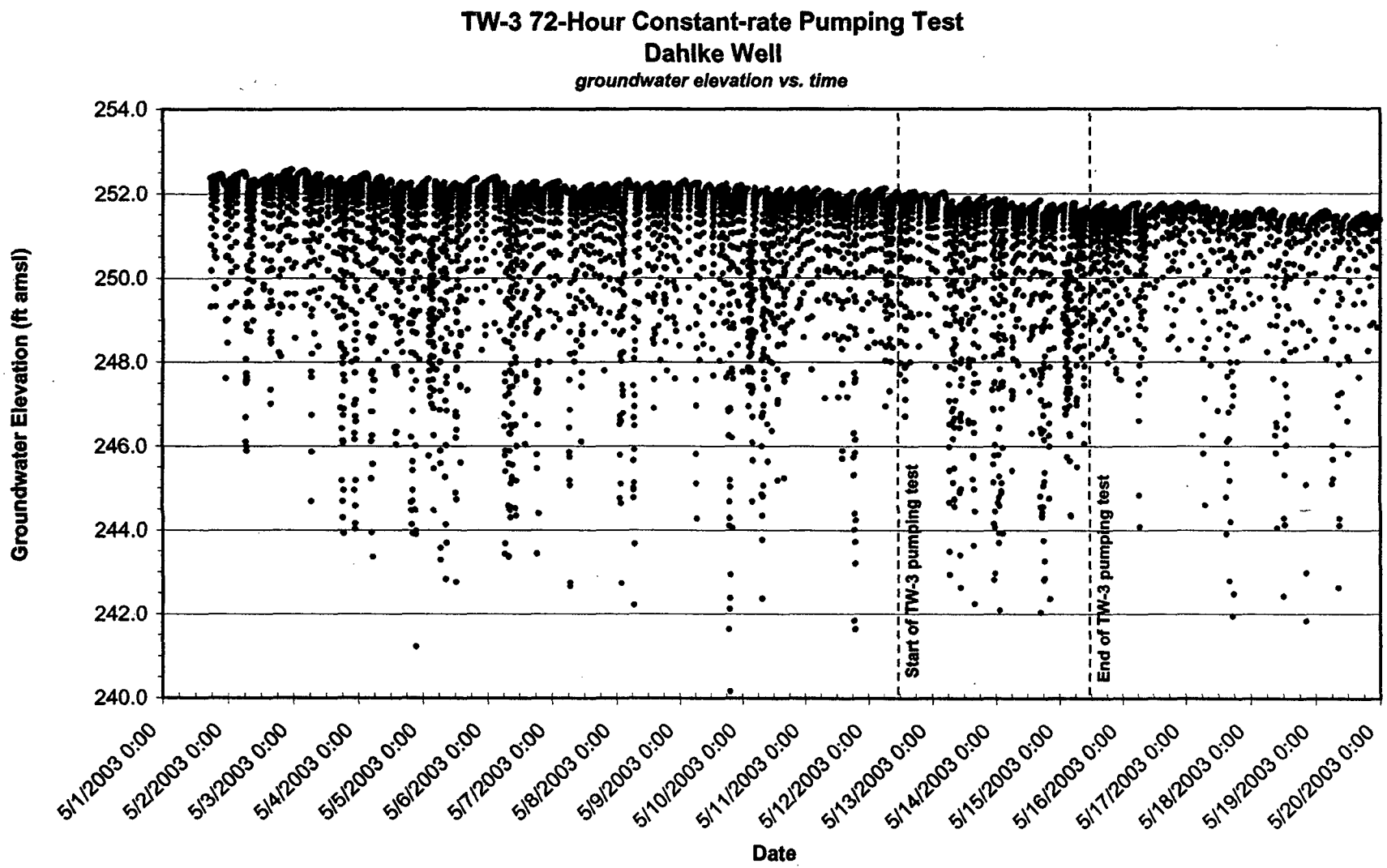


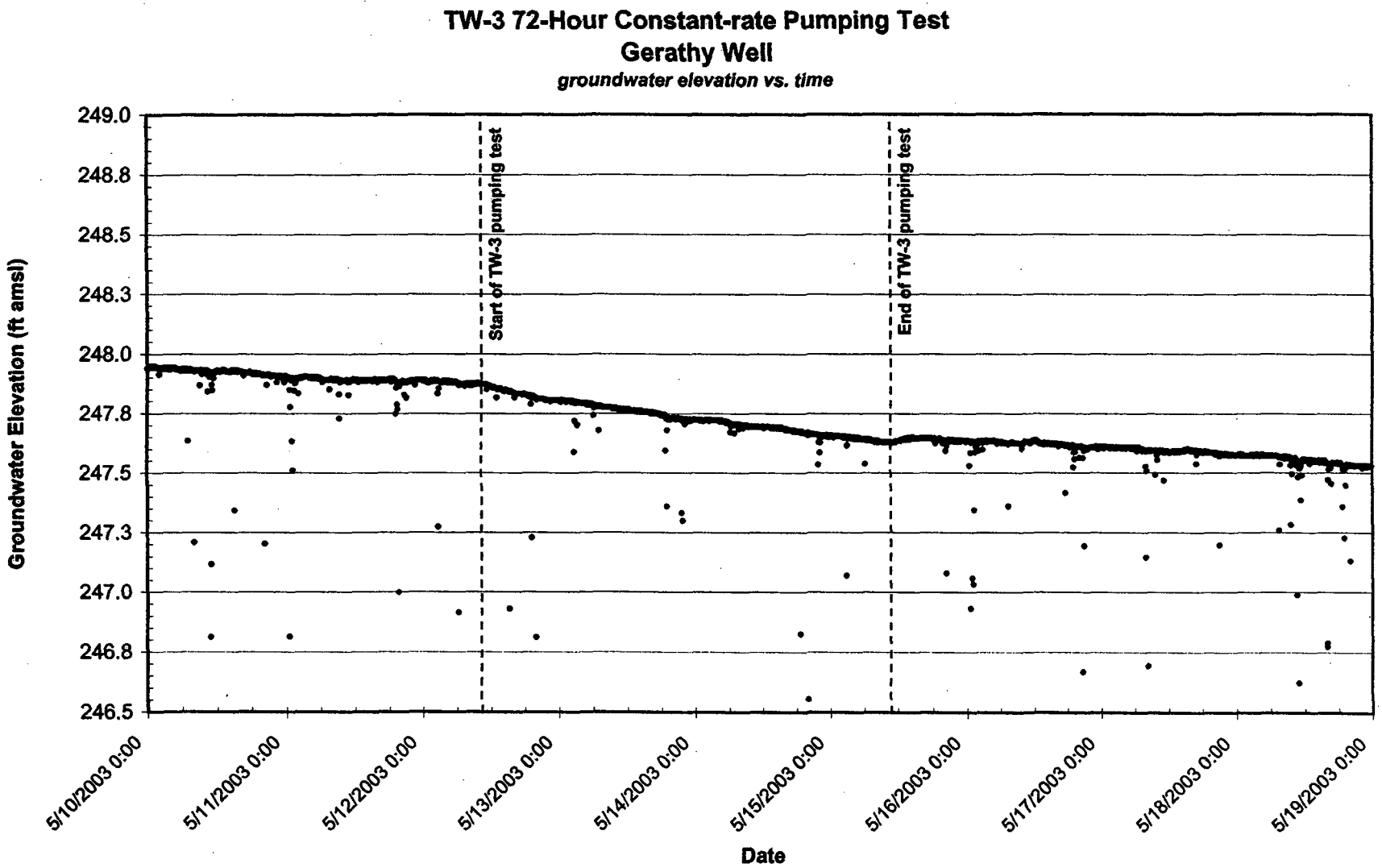
TW-3 72-Hour Constant-rate Pumping Test
72-Hour Distance-drawdown

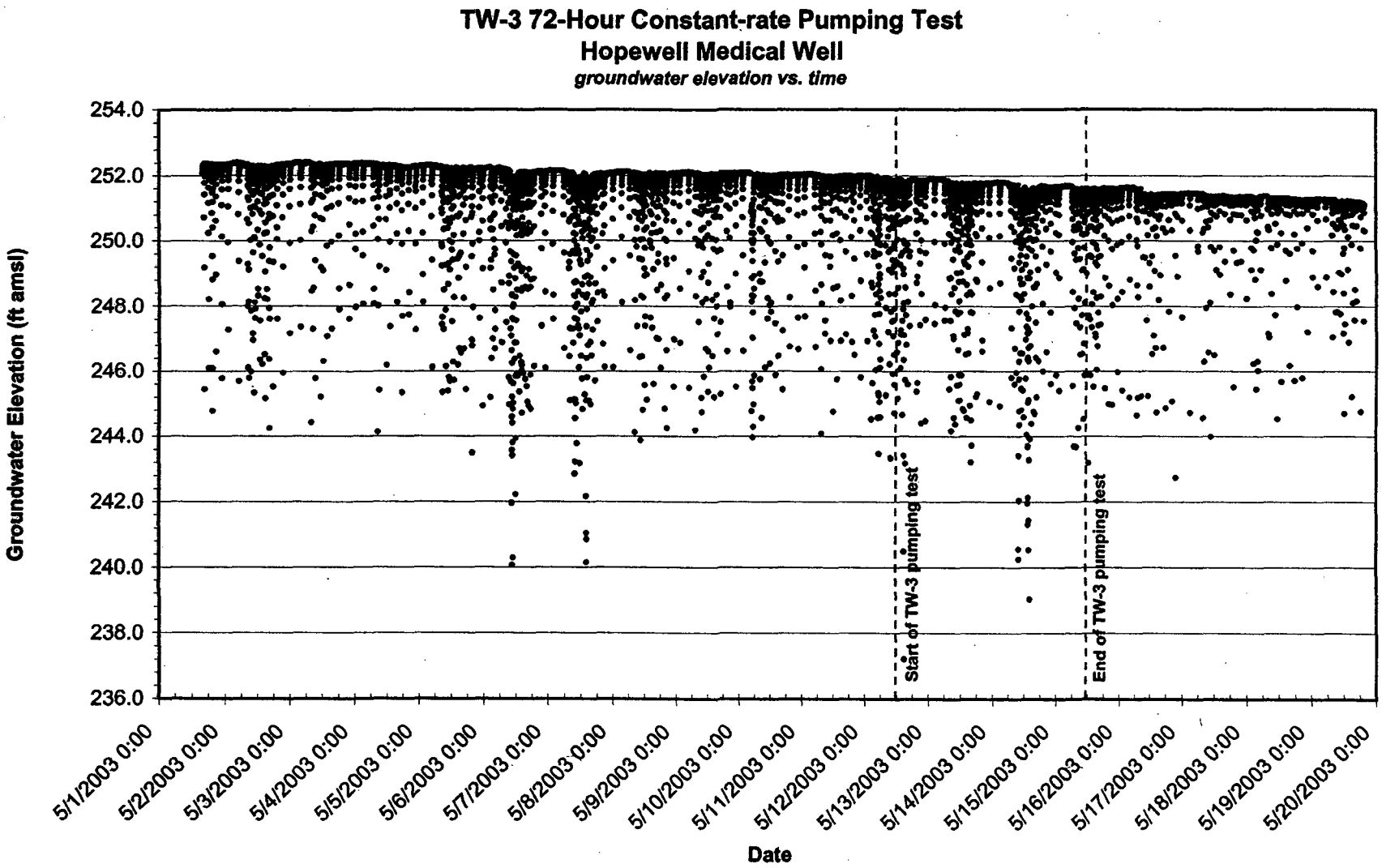


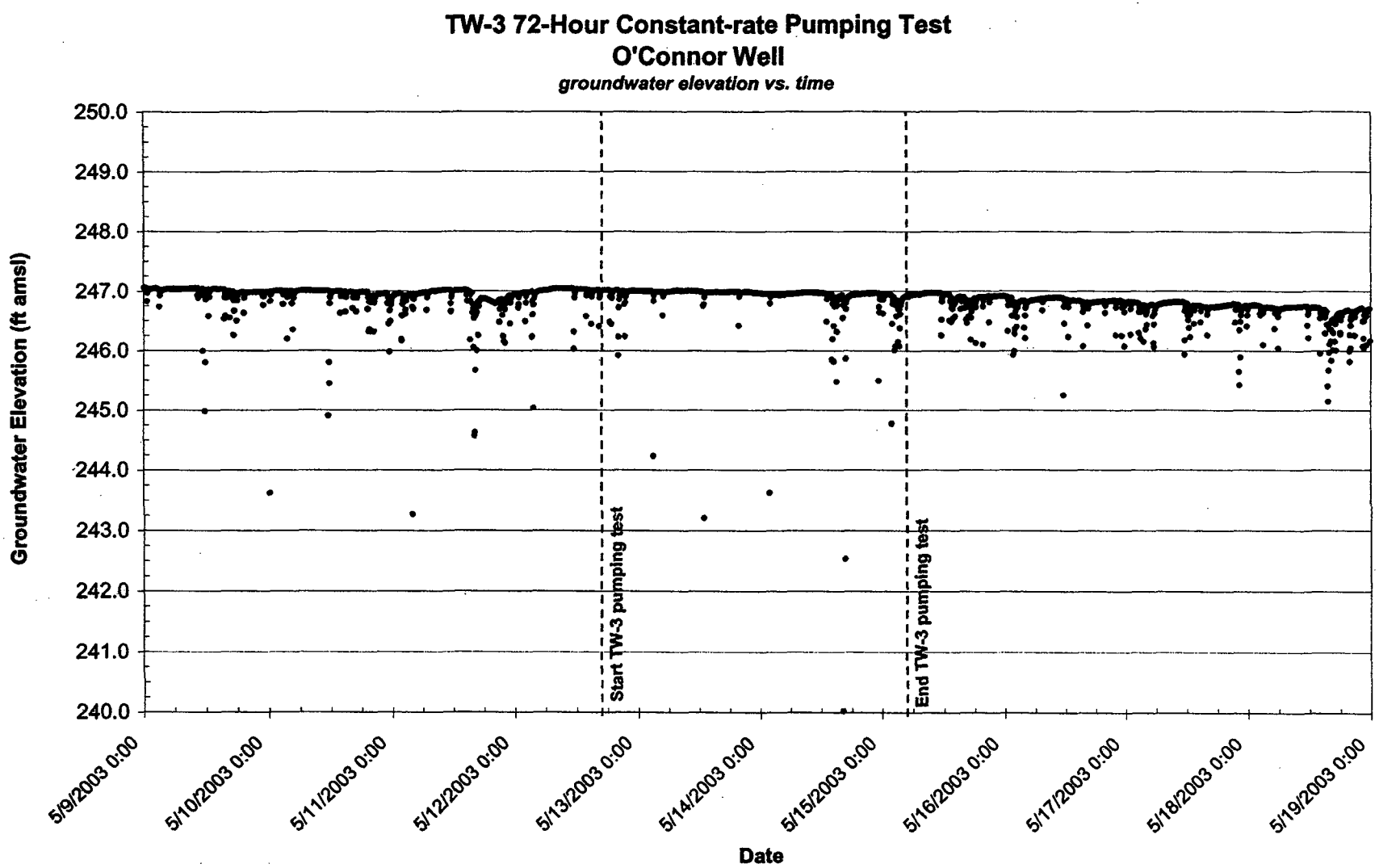
TW-3 72-Hour Constant-rate Pumping Test
TW-3 Recovery Analysis
time ratio, t/t' vs. residual drawdown



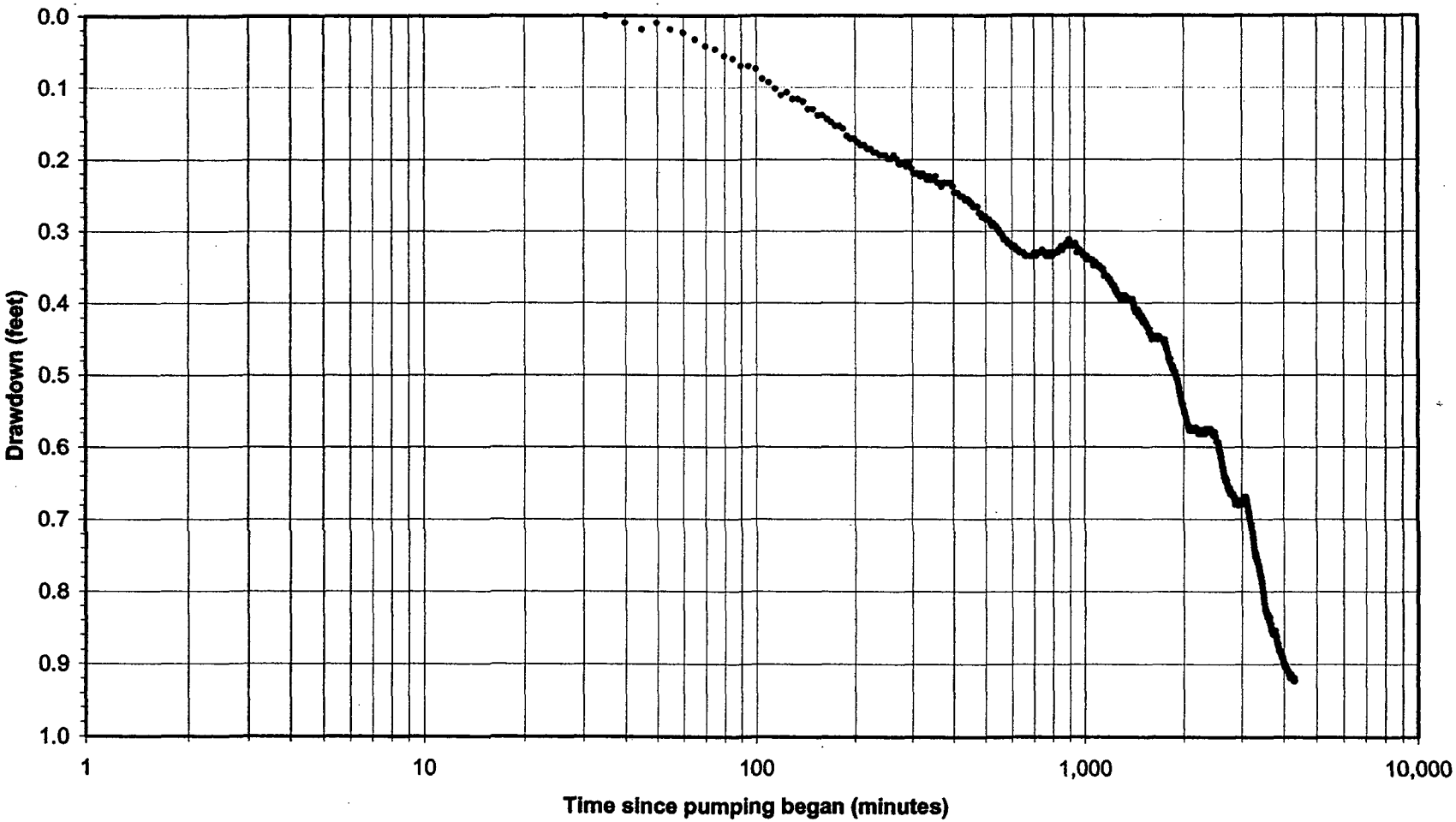

TW-3 72-Hour Constant-rate Pumping Test
Dahlke Well
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
254.0
252.0
250.0
248.0
246.0
244.0
242.0
240.0
Start of TW-3 pumping test
End of TW-3 pumping test
5/1/2003 0:00
5/2/2003 0:00
5/3/2003 0:00
5/4/2003 0:00
5/5/2003 0:00
5/6/2003 0:00
5/7/2003 0:00
5/8/2003 0:00
5/9/2003 0:00
5/10/2003 0:00
5/11/2003 0:00
5/12/2003 0:00
5/13/2003 0:00
5/14/2003 0:00
5/15/2003 0:00
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
Date

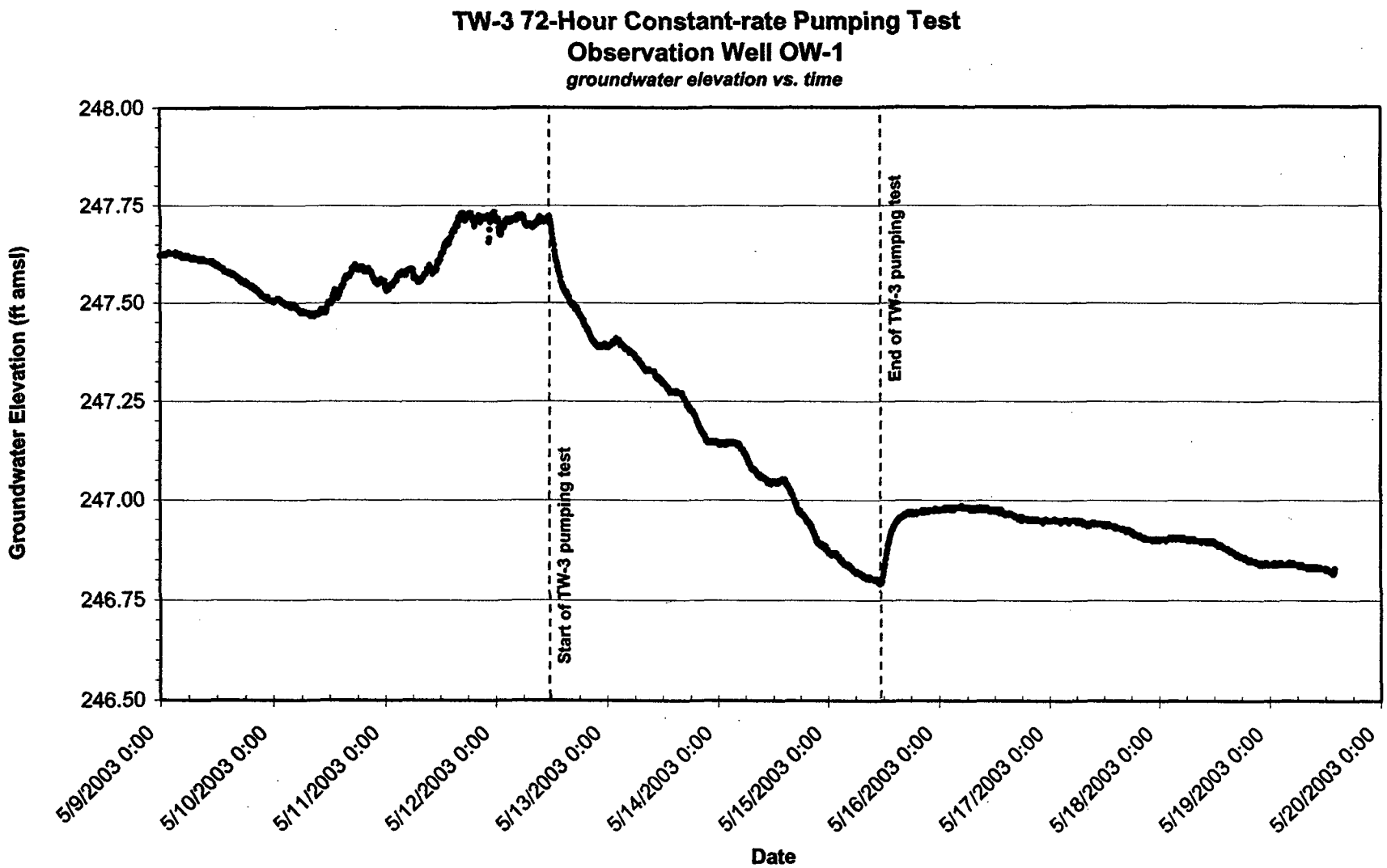

TW-3 72-Hour Constant-rate Pumping Test
Gerathy Well
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
249.0
248.8
248.5
248.3
248.0
247.8
247.5
247.3
247.0
246.8
246.5
Start of TW-3 pumping test
End of TW-3 pumping test
5/10/2003 0:00
5/11/2003 0:00
5/12/2003 0:00
5/13/2003 0:00
5/14/2003 0:00
5/15/2003 0:00
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
Date

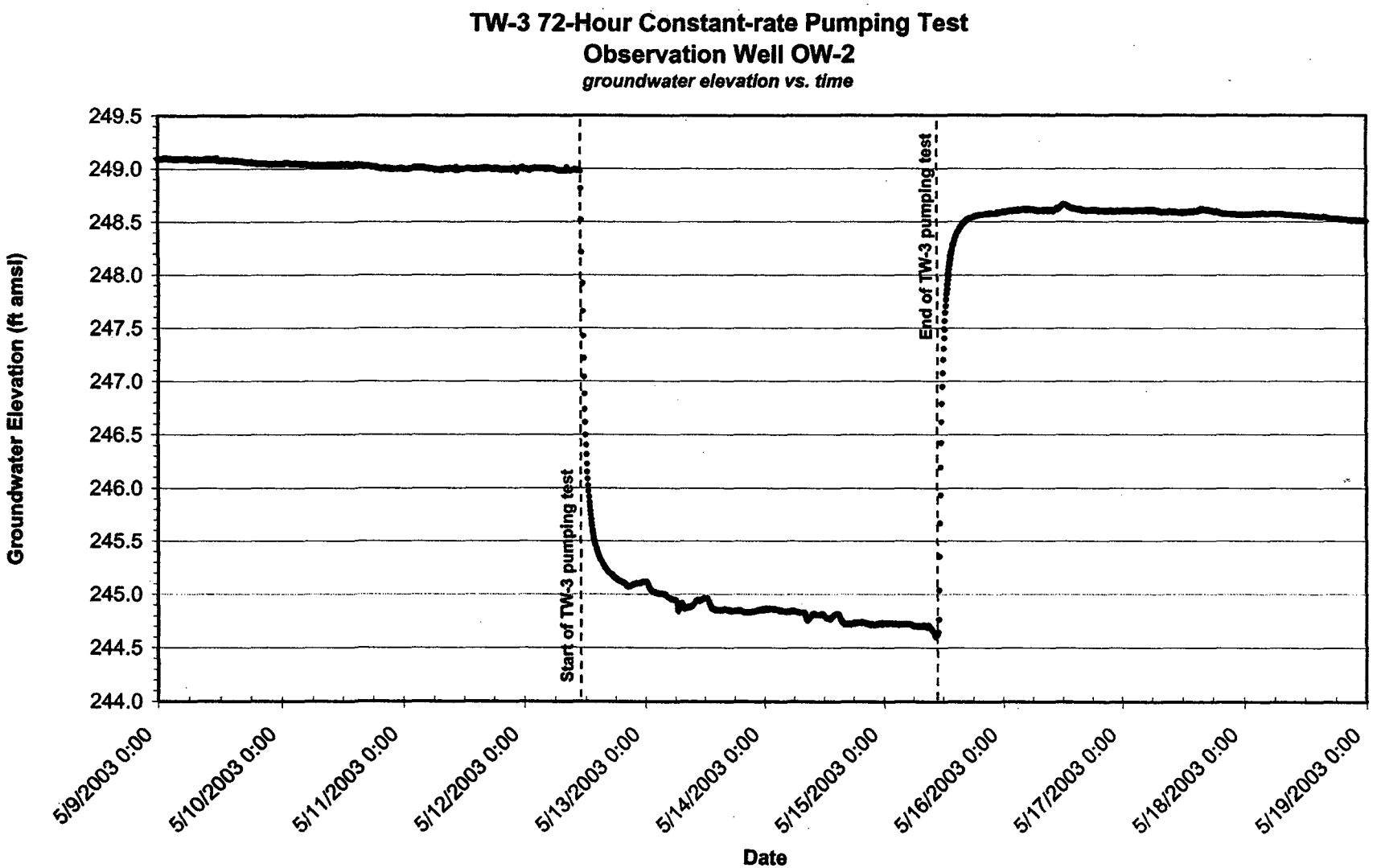

TW-3 72-Hour Constant-rate Pumping Test
Hopewell Medical Well
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
254.0
252.0
250.0
248.0
246.0
244.0
242.0
240.0
238.0
236.0
Start of TW-3 pumping test
End of TW-3 pumping test
5/1/2003 0:00
5/2/2003 0:00
5/3/2003 0:00
5/4/2003 0:00
5/5/2003 0:00
5/6/2003 0:00
5/7/2003 0:00
5/8/2003 0:00
5/9/2003 0:00
5/10/2003 0:00
5/11/2003 0:00
5/12/2003 0:00
5/13/2003 0:00
5/14/2003 0:00
5/15/2003 0:00
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
Date

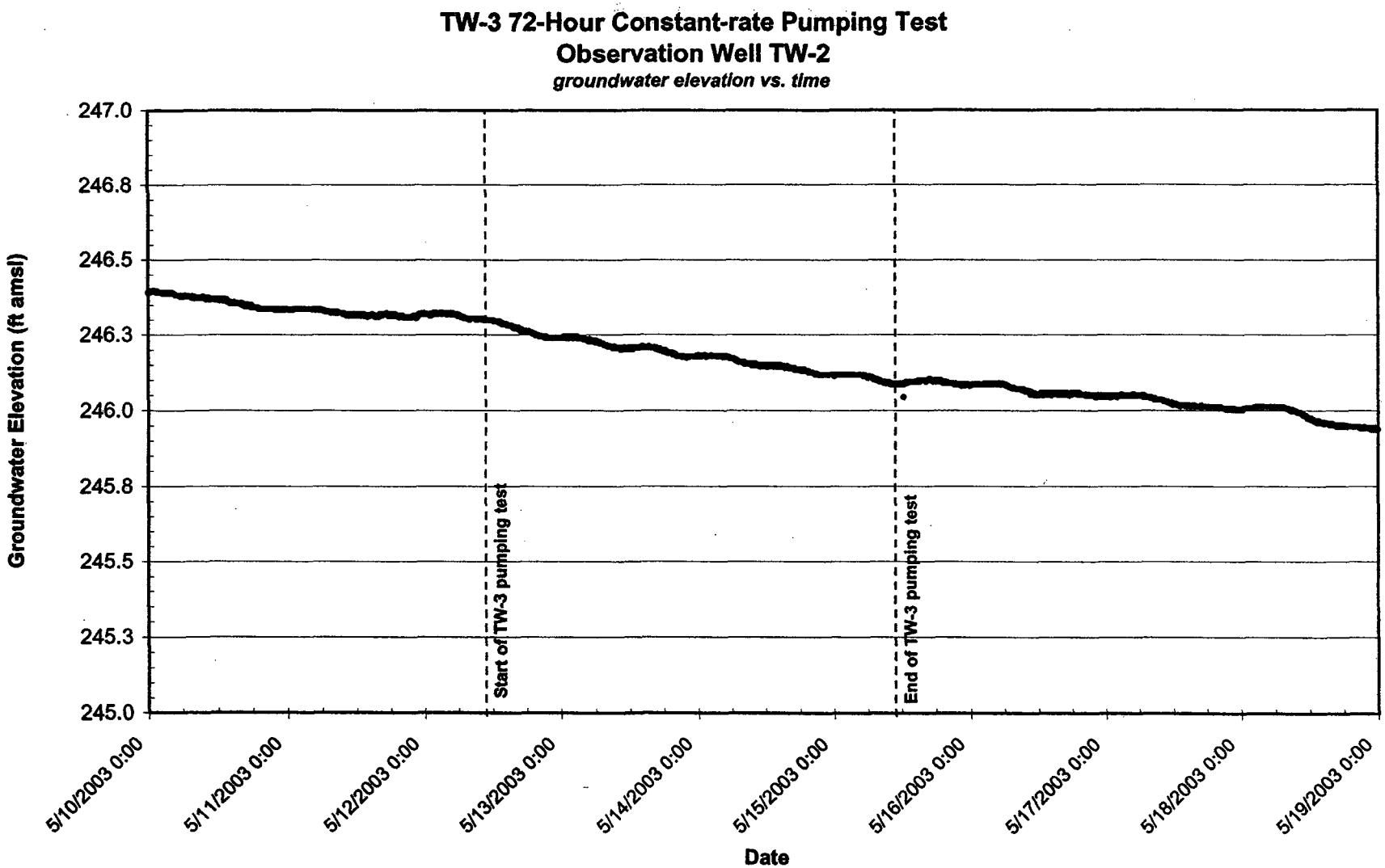

TW-3 72-Hour Constant-rate Pumping Test
O'Connor Well
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
250.0
249.0
248.0
247.0
246.0
245.0
244.0
243.0
242.0
241.0
240.0
Start TW-3 pumping test
End TW-3 pumping test
5/9/2003 0:00
5/10/2003 0:00
5/11/2003 0:00
5/12/2003 0:00
5/13/2003 0:00
5/14/2003 0:00
5/15/2003 0:00
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
Date

TW-3 72-Hour Constant-rate Pumping Test
Observation Well OW-1
time vs. drawdown

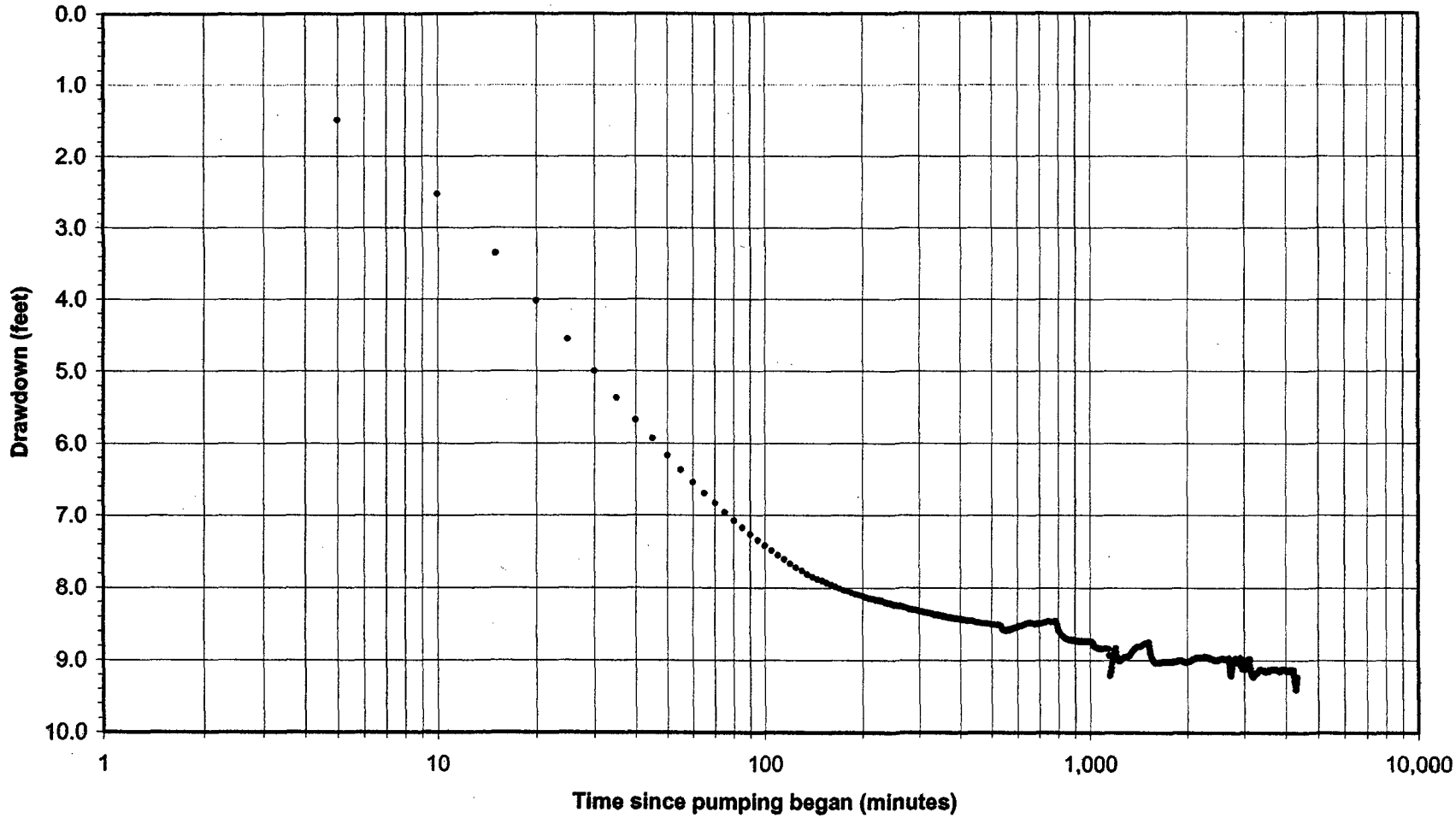


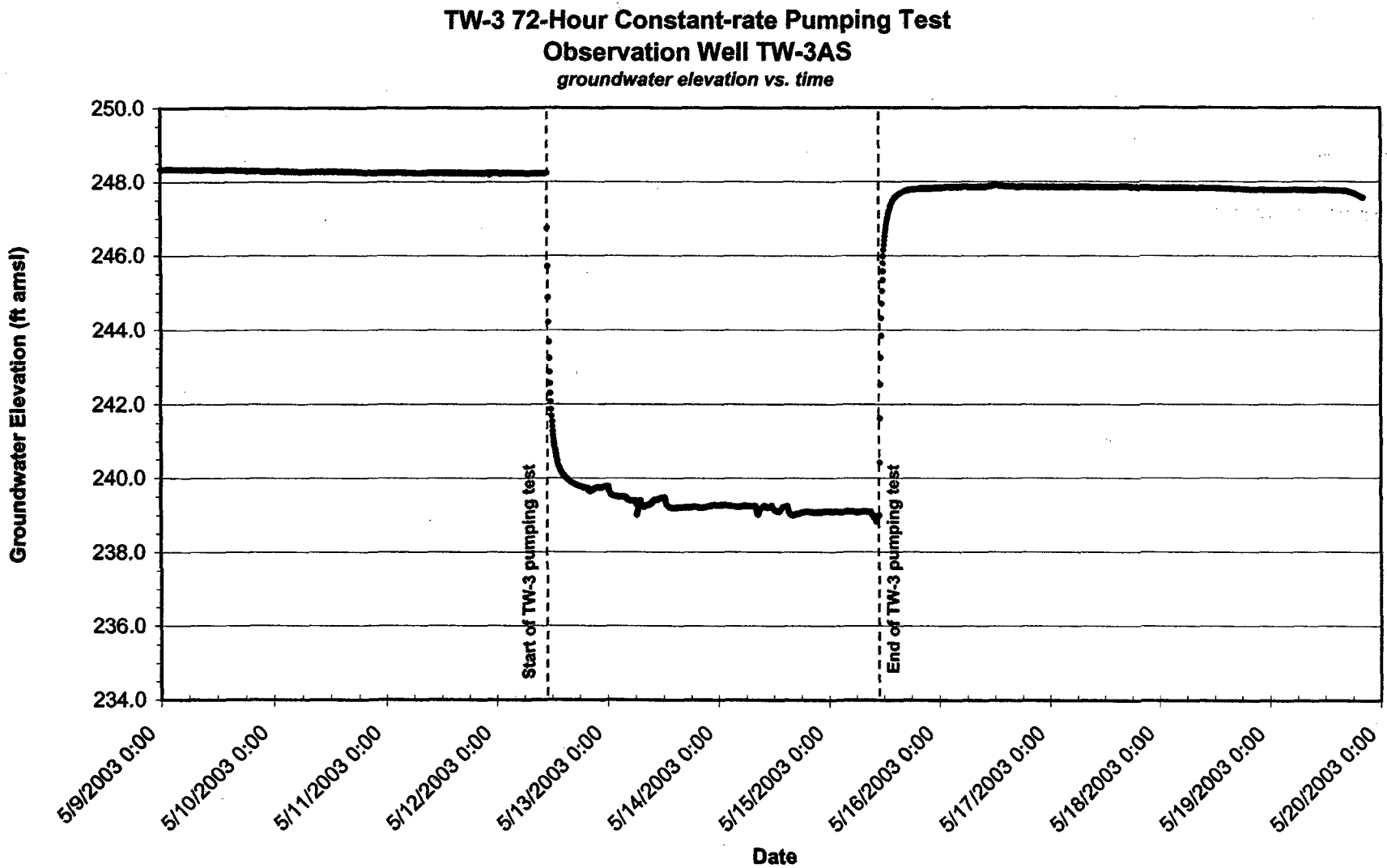

TW-3 72-Hour Constant-rate Pumping Test
Observation Well OW-1
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
248.00
247.75
247.50
247.25
247.00
246.75
246.50
Start of TW-3 pumping test
End of TW-3 pumping test
5/9/2003 0:00
5/10/2003 0:00
5/11/2003 0:00
5/12/2003 0:00
5/13/2003 0:00
5/14/2003 0:00
5/15/2003 0:00
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
Date


TW-3 72-Hour Constant-rate Pumping Test
Observation Well OW-2
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
249.5
249.0
248.5
248.0
247.5
247.0
246.5
246.0
245.5
245.0
244.5
244.0
Start of TW-3 pumping test
End of TW-3 pumping test
5/9/2003 0:00
5/10/2003 0:00
5/11/2003 0:00
5/12/2003 0:00
5/13/2003 0:00
5/14/2003 0:00
5/15/2003 0:00
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
Date

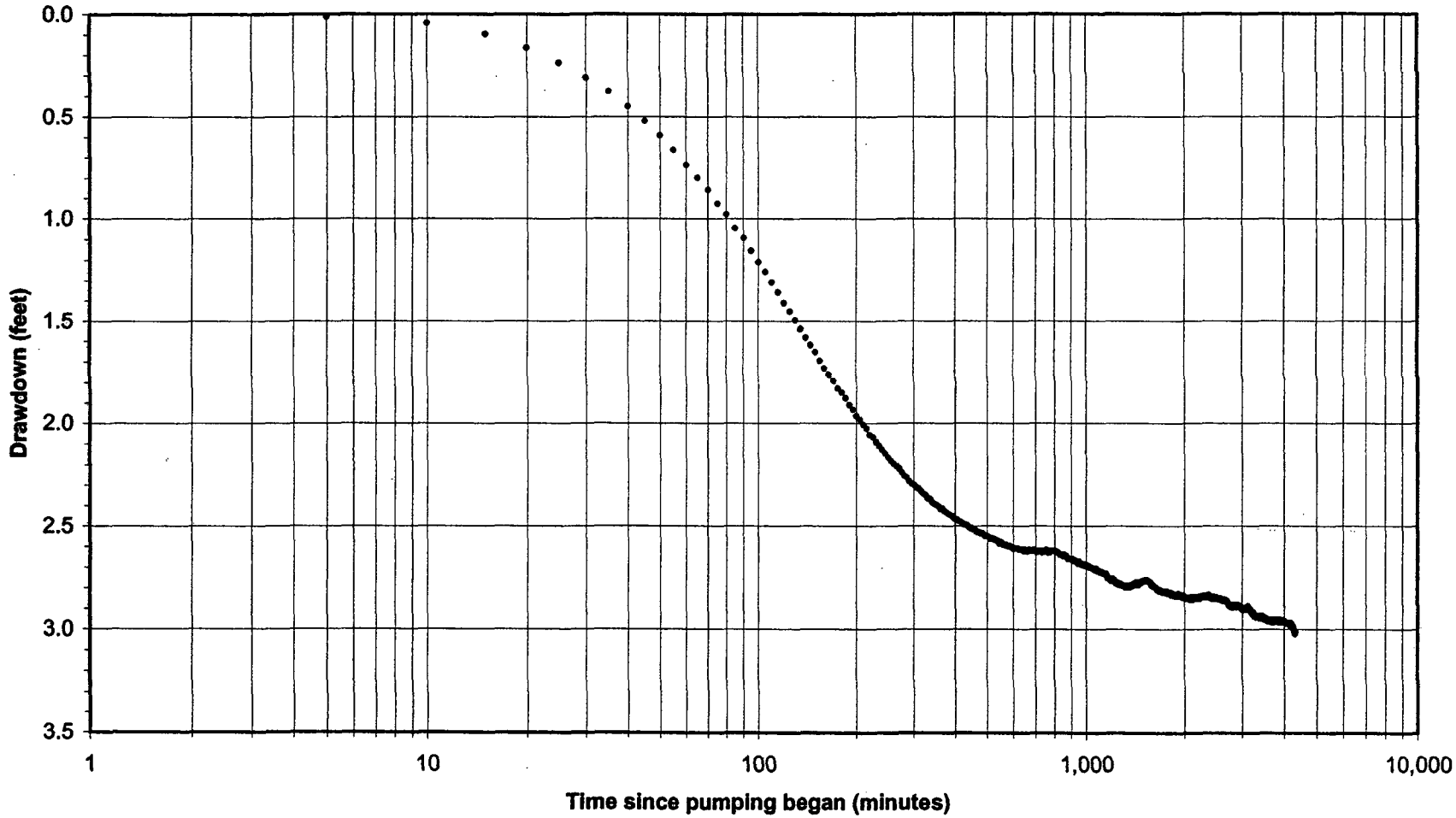

TW-3 72-Hour Constant-rate Pumping Test
Observation Well TW-2
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
247.0
246.8
246.5
246.3
246.0
245.8
245.5
245.3
245.0
Start of TW-3 pumping test
End of TW-3 pumping test
5/10/2003 0:00
5/11/2003 0:00
5/12/2003 0:00
5/13/2003 0:00
5/14/2003 0:00
5/15/2003 0:00
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
Date

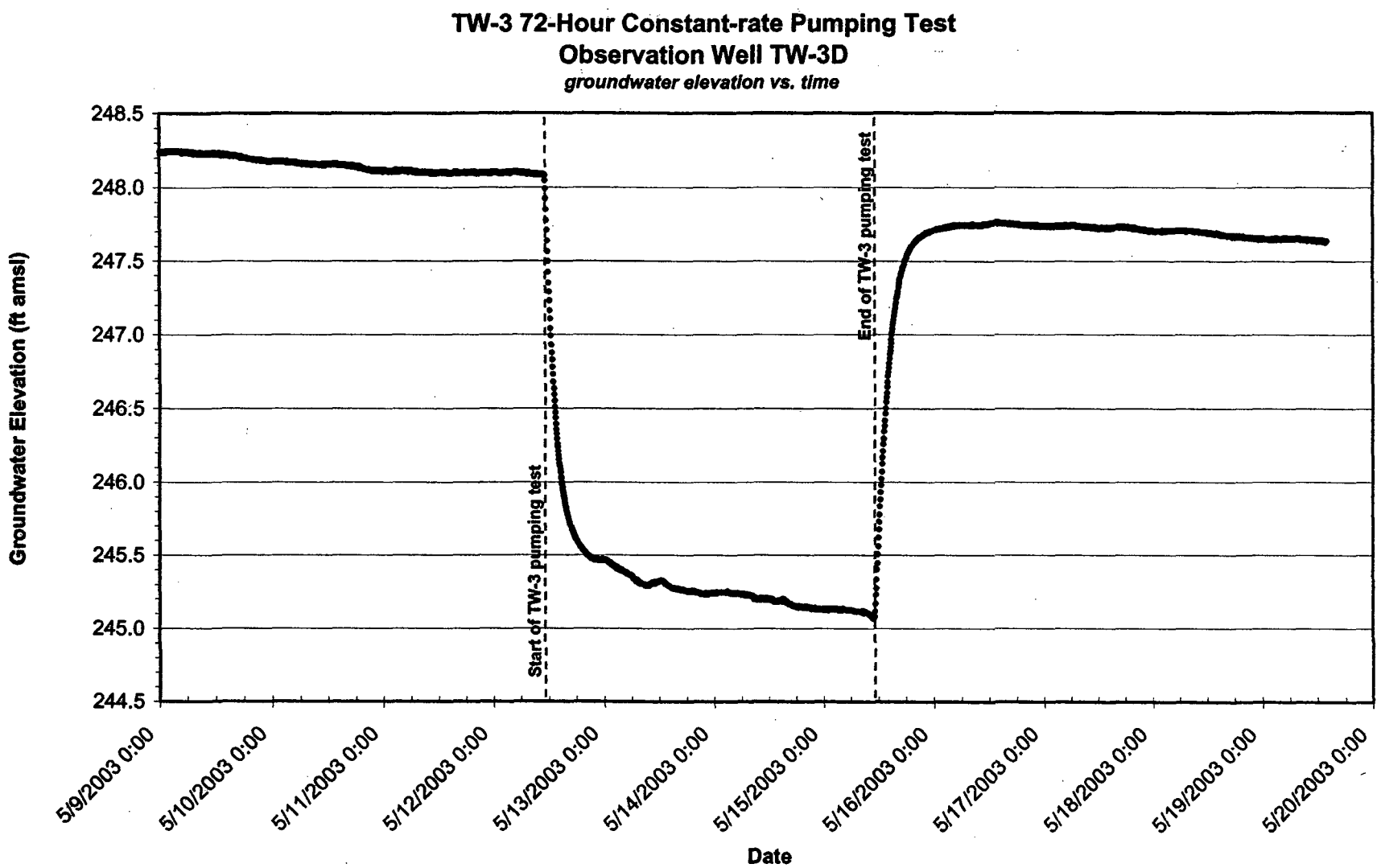
TW-3 72-Hour Constant-rate Pumping Test
Observation Well TW-3AS
time vs. drawdown

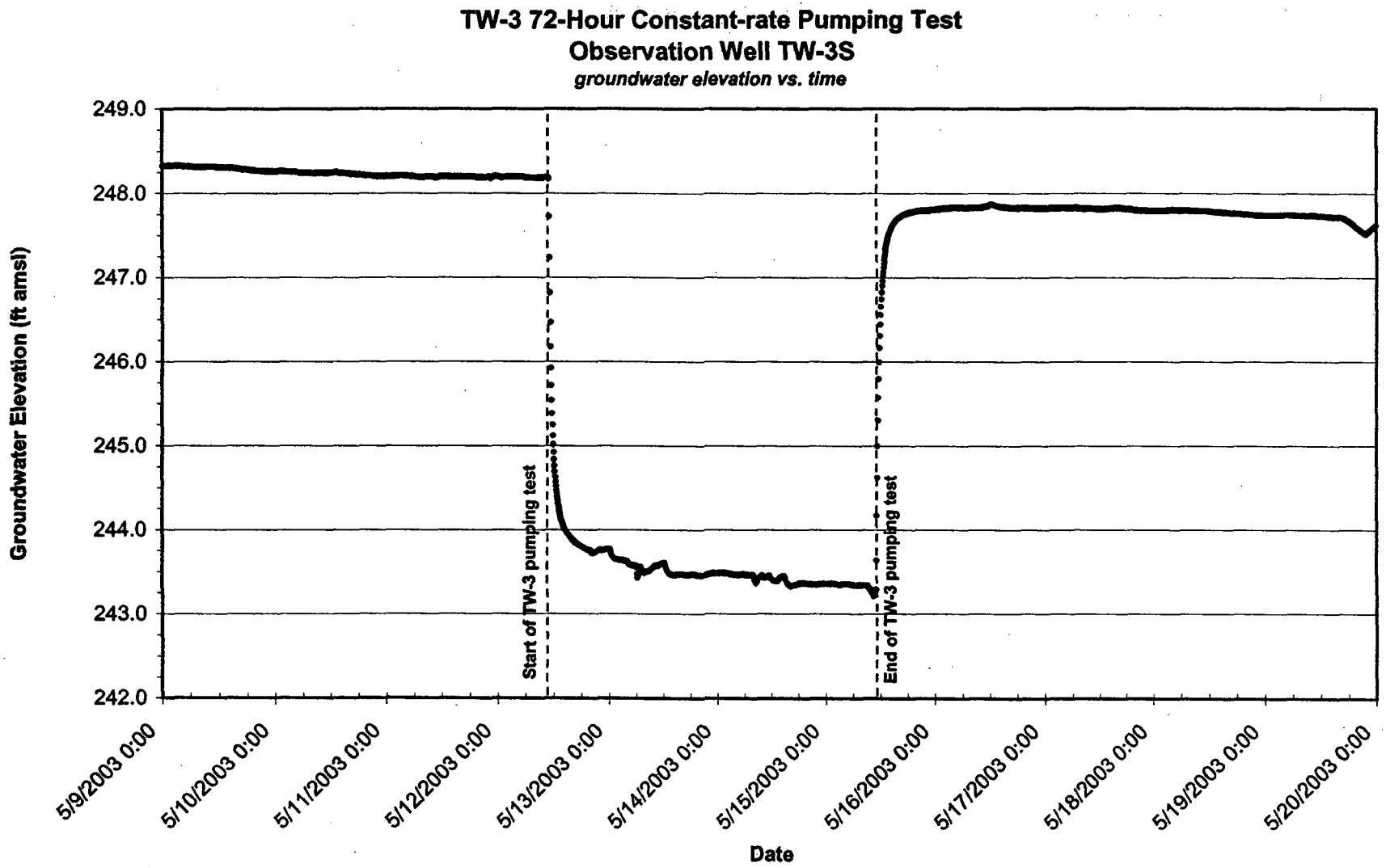


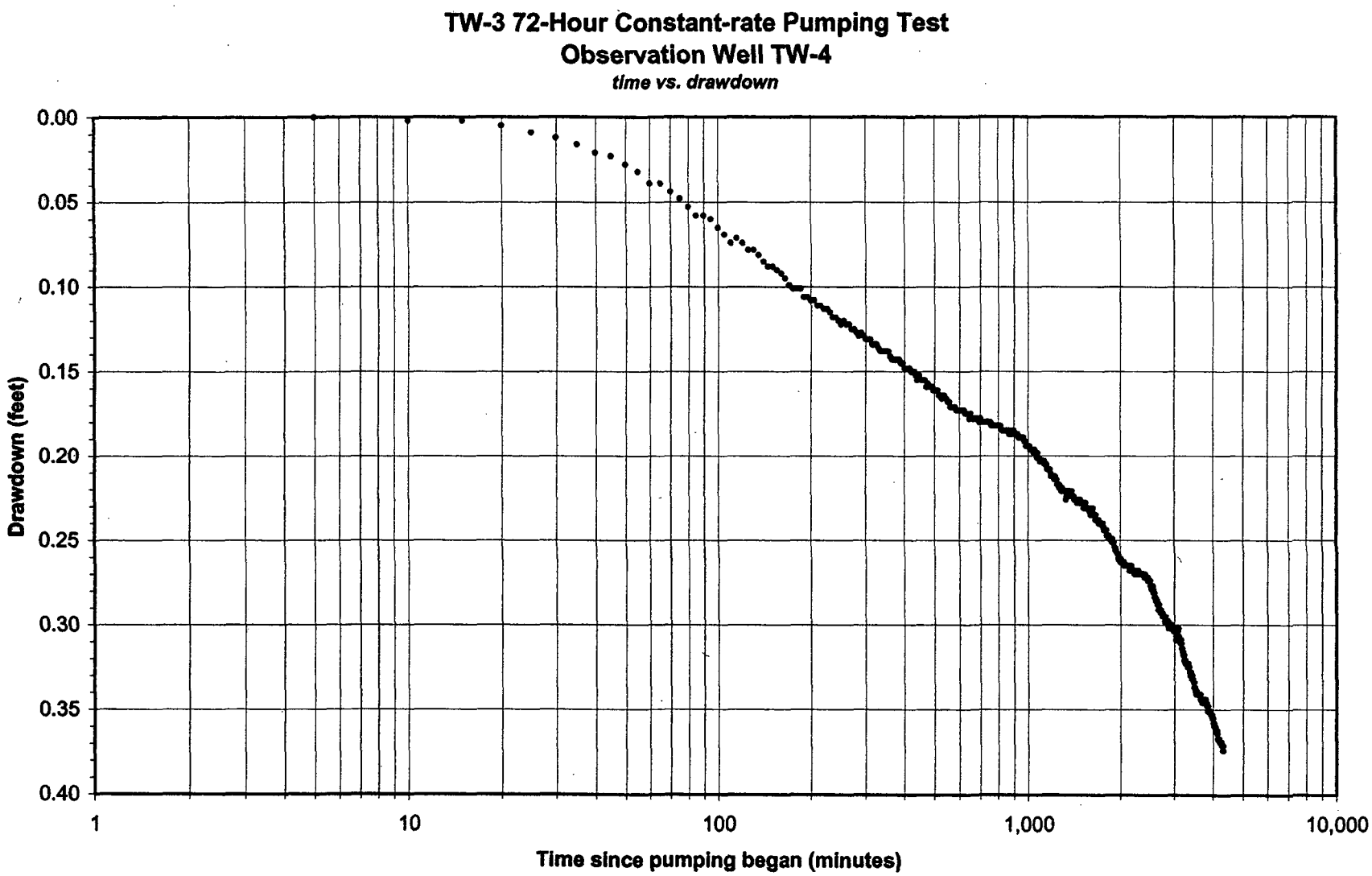

TW-3 72-Hour Constant-rate Pumping Test
Observation Well TW-3AS
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
250.0
248.0
246.0
244.0
242.0
240.0
238.0
236.0
234.0
Start of TW-3 pumping test
End of TW-3 pumping test
5/9/2003 0:00
5/10/2003 0:00
5/11/2003 0:00
5/12/2003 0:00
5/13/2003 0:00
5/14/2003 0:00
5/15/2003 0:00
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
Date

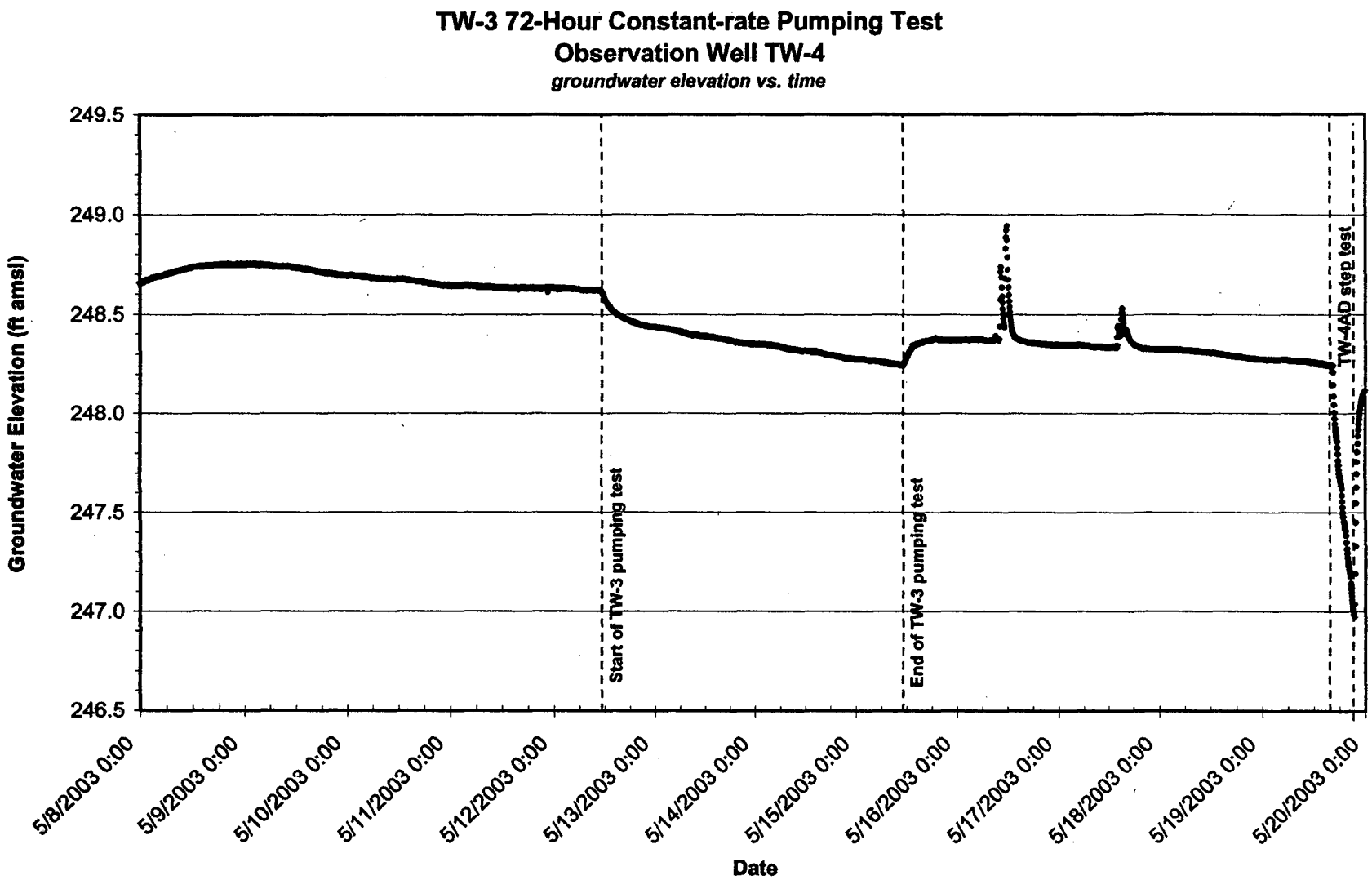
TW-3 72-Hour Constant-rate Pumping Test
Observation Well TW-3D
time vs. drawdown

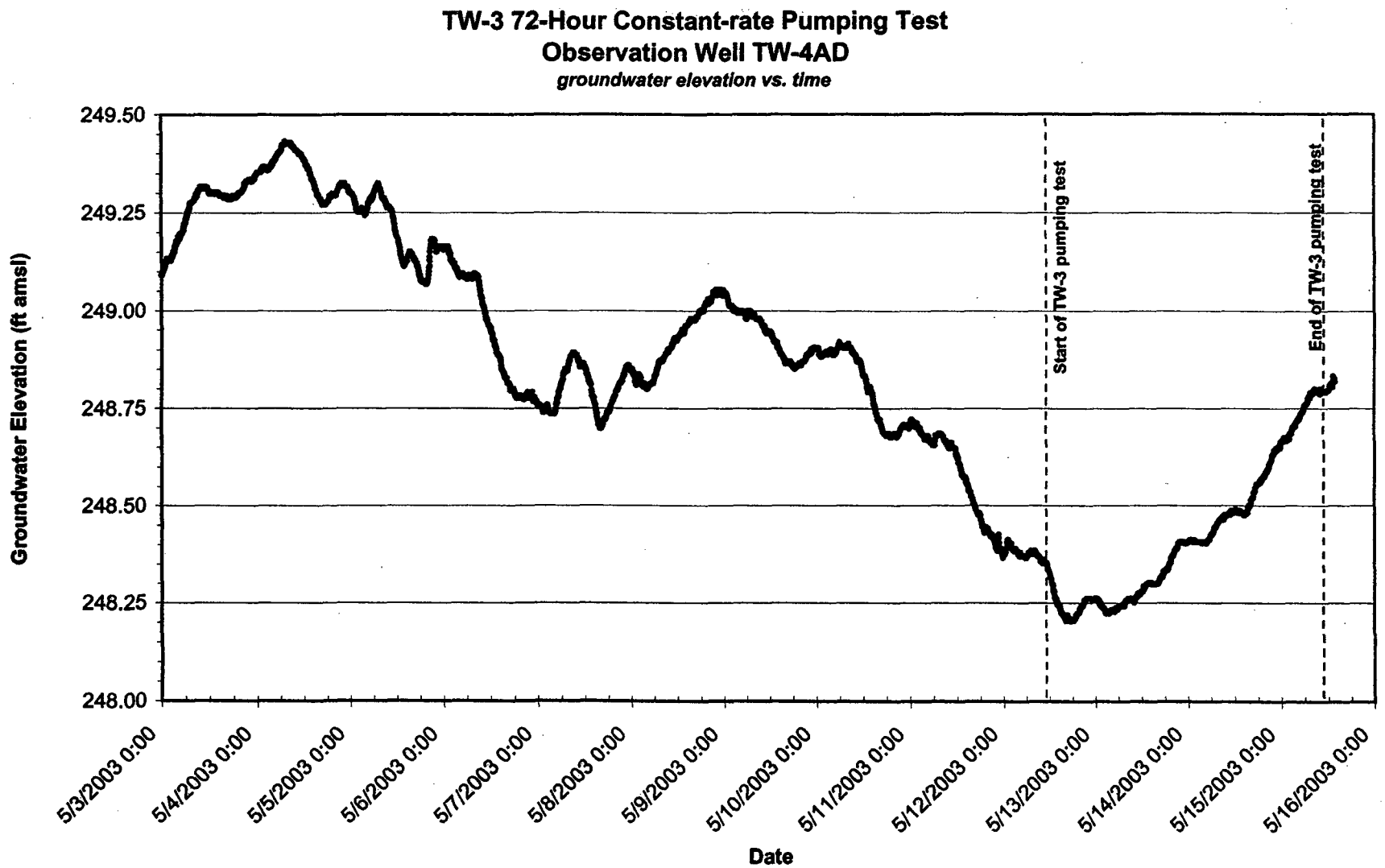


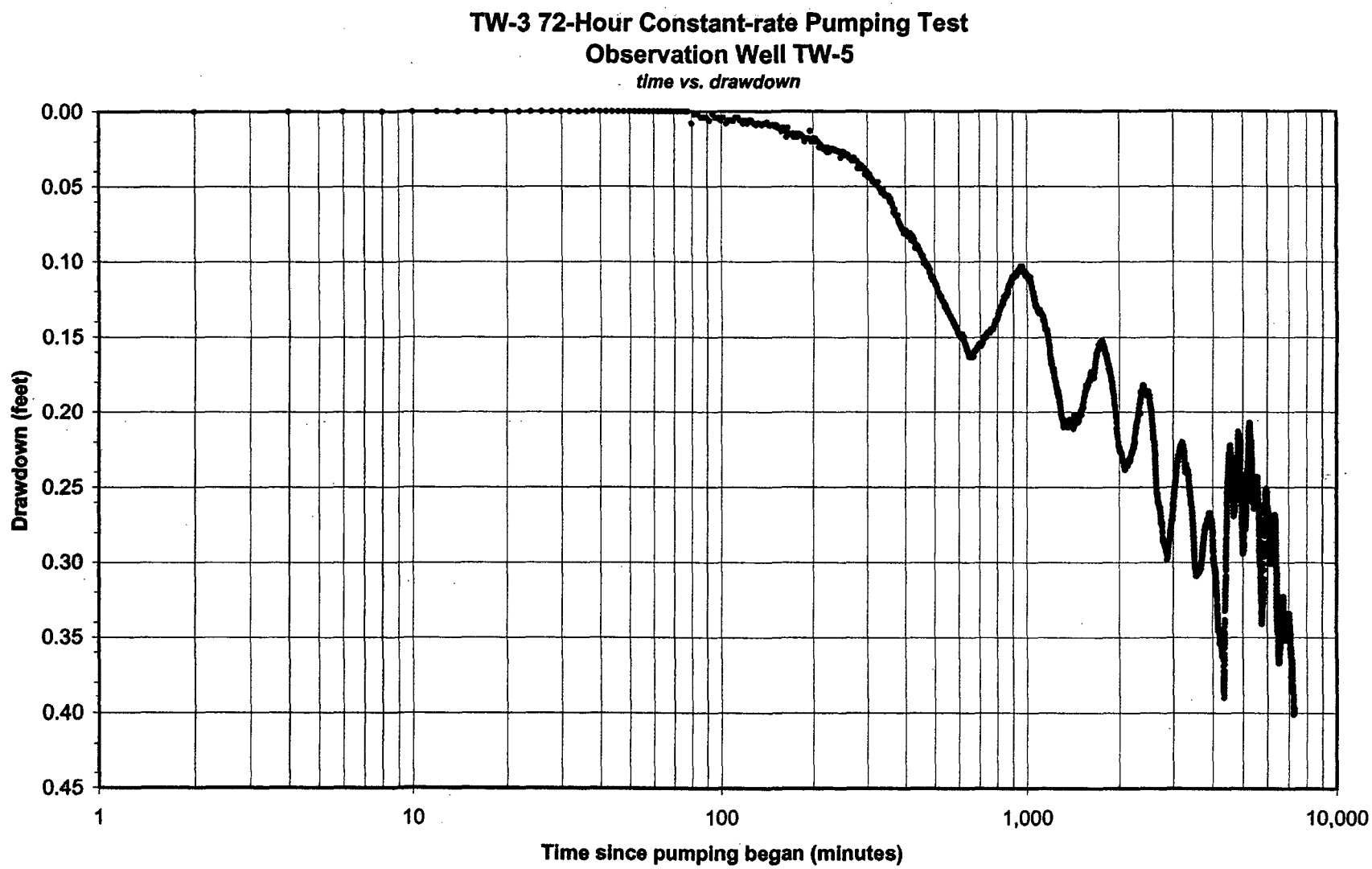

TW-3 72-Hour Constant-rate Pumping Test
Observation Well TW-3D
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
248.5
248.0
247.5
247.0
246.5
246.0
245.5
245.0
244.5
Start of TW-3 pumping test
End of TW-3 pumping test
5/9/2003 0:00
5/10/2003 0:00
5/11/2003 0:00
5/12/2003 0:00
5/13/2003 0:00
5/14/2003 0:00
5/15/2003 0:00
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
Date

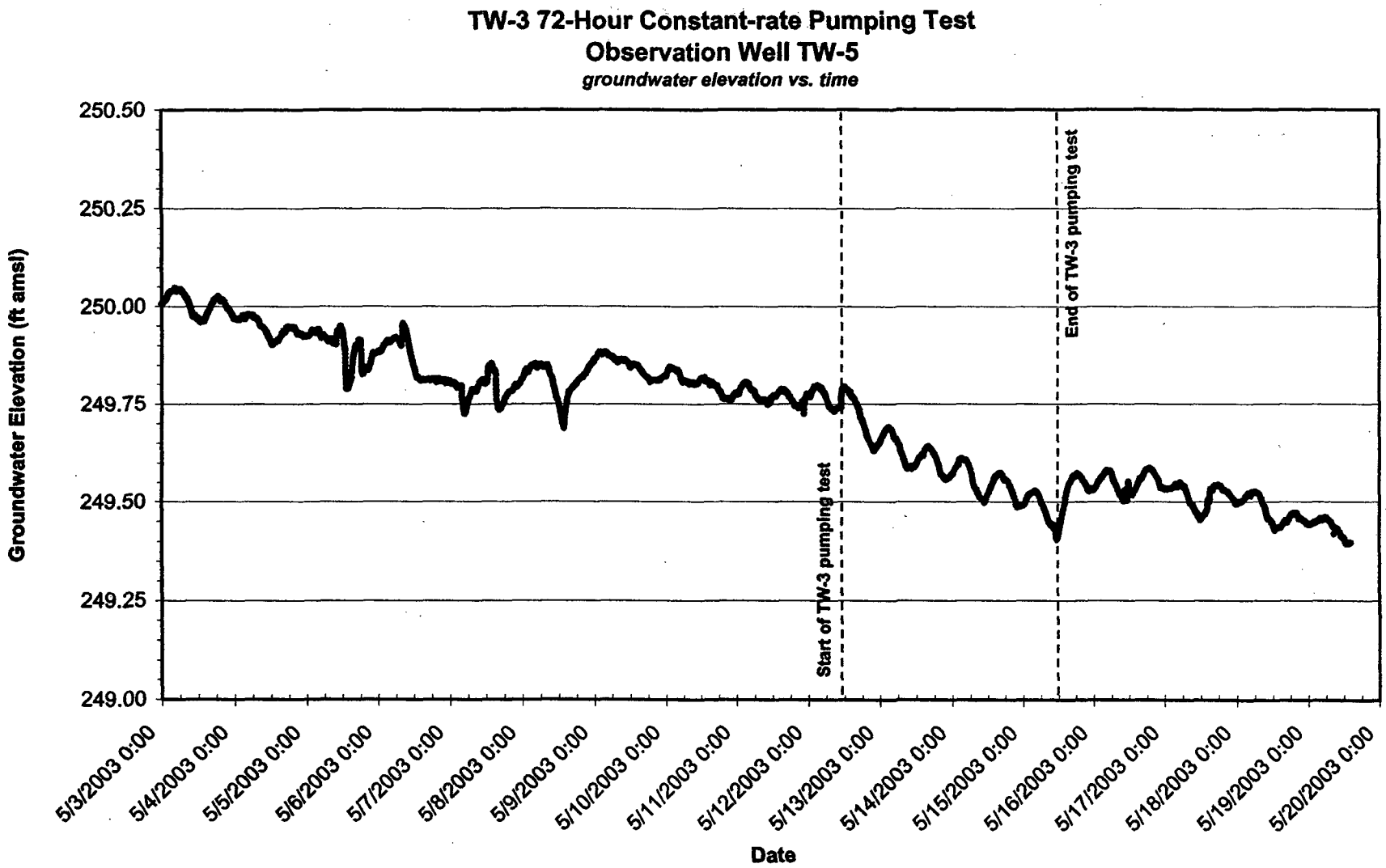

TW-3 72-Hour Constant-rate Pumping Test
Observation Well TW-3S
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
249.0
248.0
247.0
246.0
245.0
244.0
243.0
242.0
Start of TW-3 pumping test
End of TW-3 pumping test
5/9/2003 0:00
5/10/2003 0:00
5/11/2003 0:00
5/12/2003 0:00
5/13/2003 0:00
5/14/2003 0:00
5/15/2003 0:00
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
Date

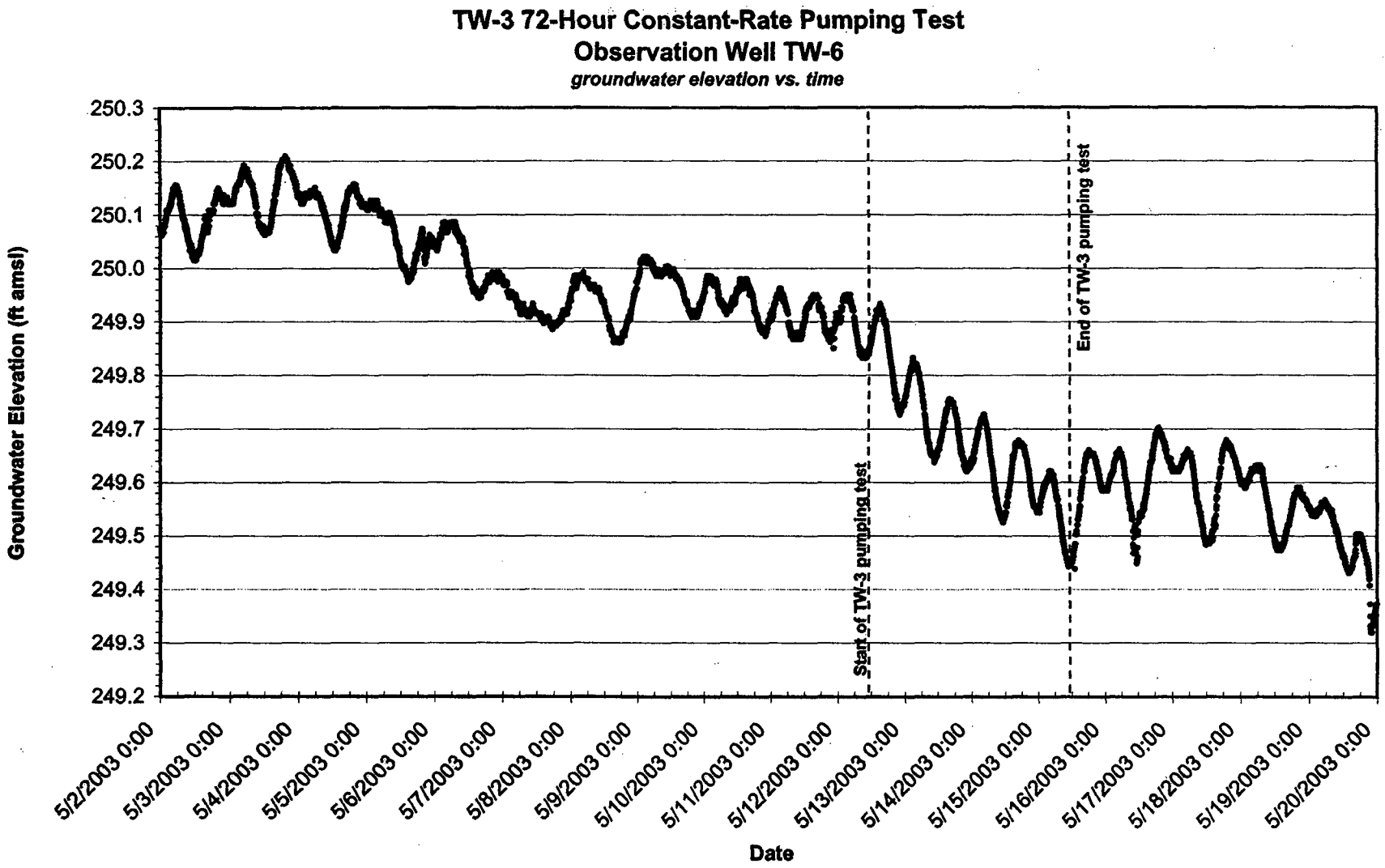

TW-3 72-Hour Constant-rate Pumping Test
Observation Well TW-4
time vs. drawdown
Drawdown (feet)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
1
10
100
1,000
10,000
Time since pumping began (minutes)

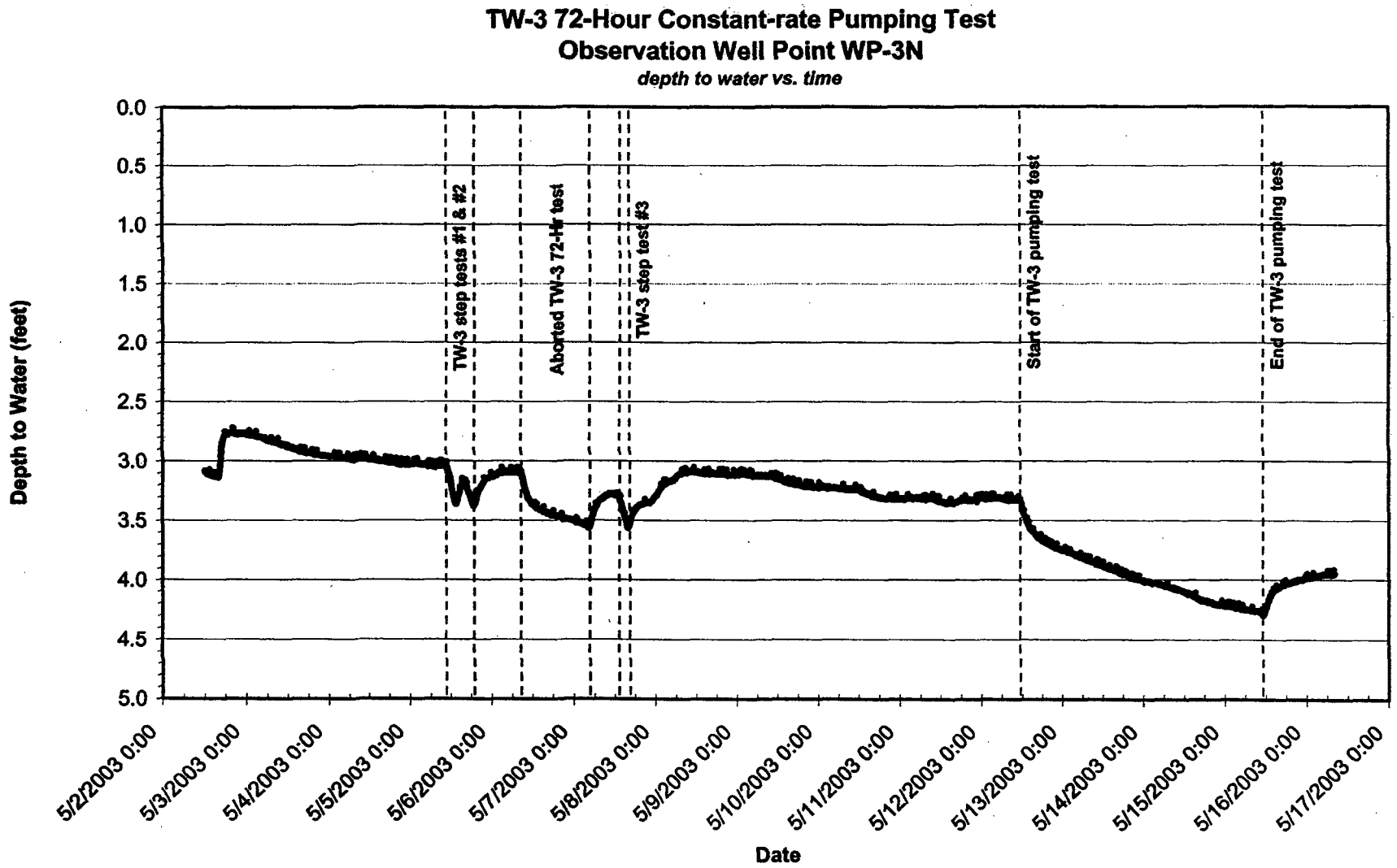

TW-3 72-Hour Constant-rate Pumping Test
Observation Well TW-4
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
249.5
249.0
248.5
248.0
247.5
247.0
246.5
Start of TW-3 pumping test
End of TW-3 pumping test
TW-4AD step test
5/8/2003 0:00
5/9/2003 0:00
5/10/2003 0:00
5/11/2003 0:00
5/12/2003 0:00
5/13/2003 0:00
5/14/2003 0:00
5/15/2003 0:00
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
Date


TW-3 72-Hour Constant-rate Pumping Test
Observation Well TW-4AD
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
249.50
249.25
249.00
248.75
248.50
248.25
248.00
Start of TW-3 pumping test
End of TW-3 pumping test
5/3/2003 0:00
5/4/2003 0:00
5/5/2003 0:00
5/6/2003 0:00
5/7/2003 0:00
5/8/2003 0:00
5/9/2003 0:00
5/10/2003 0:00
5/11/2003 0:00
5/12/2003 0:00
5/13/2003 0:00
5/14/2003 0:00
5/15/2003 0:00
5/16/2003 0:00
Date


TW-3 72-Hour Constant-rate Pumping Test
Observation Well TW-5
time vs. drawdown
Drawdown (feet)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
1
10
100
1,000
10,000
Time since pumping began (minutes)

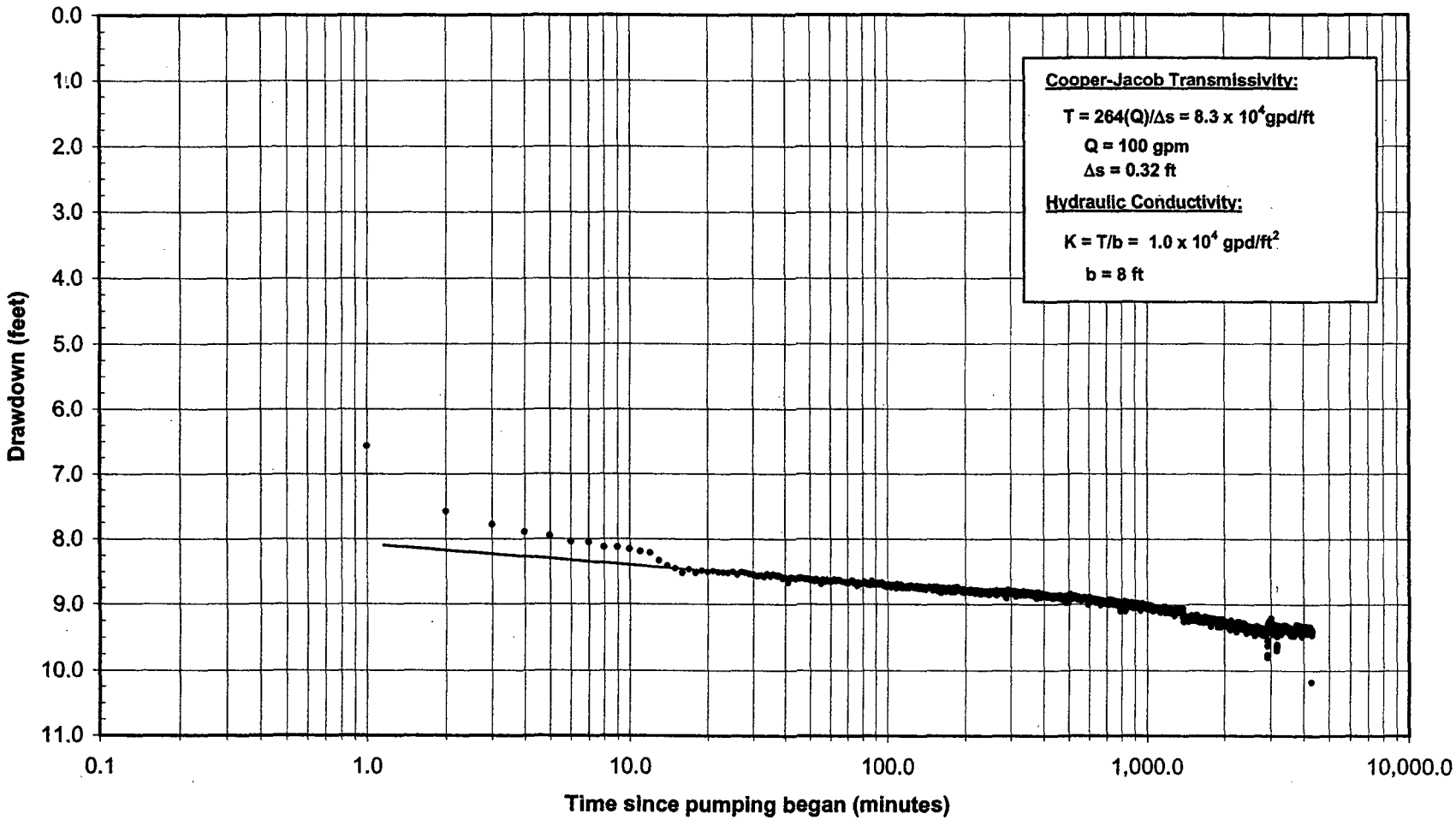

TW-3 72-Hour Constant-rate Pumping Test
Observation Well TW-5
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
250.50
250.25
250.00
249.75
249.50
249.25
249.00
Start of TW-3 pumping test
End of TW-3 pumping test
5/3/2003 0:00
5/4/2003 0:00
5/5/2003 0:00
5/6/2003 0:00
5/7/2003 0:00
5/8/2003 0:00
5/9/2003 0:00
5/10/2003 0:00
5/11/2003 0:00
5/12/2003 0:00
5/13/2003 0:00
5/14/2003 0:00
5/15/2003 0:00
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
Date


TW-3 72-Hour Constant-Rate Pumping Test
Observation Well TW-6
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
250.3
250.2
250.1
250.0
249.9
249.8
249.7
249.6
249.5
249.4
249.3
249.2
Start of TW-3 pumping test
End of TW-3 pumping test
5/2/2003 0:00
5/3/2003 0:00
5/4/2003 0:00
5/5/2003 0:00
5/6/2003 0:00
5/7/2003 0:00
5/8/2003 0:00
5/9/2003 0:00
5/10/2003 0:00
5/11/2003 0:00
5/12/2003 0:00
5/13/2003 0:00
5/14/2003 0:00
5/15/2003 0:00
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
Date

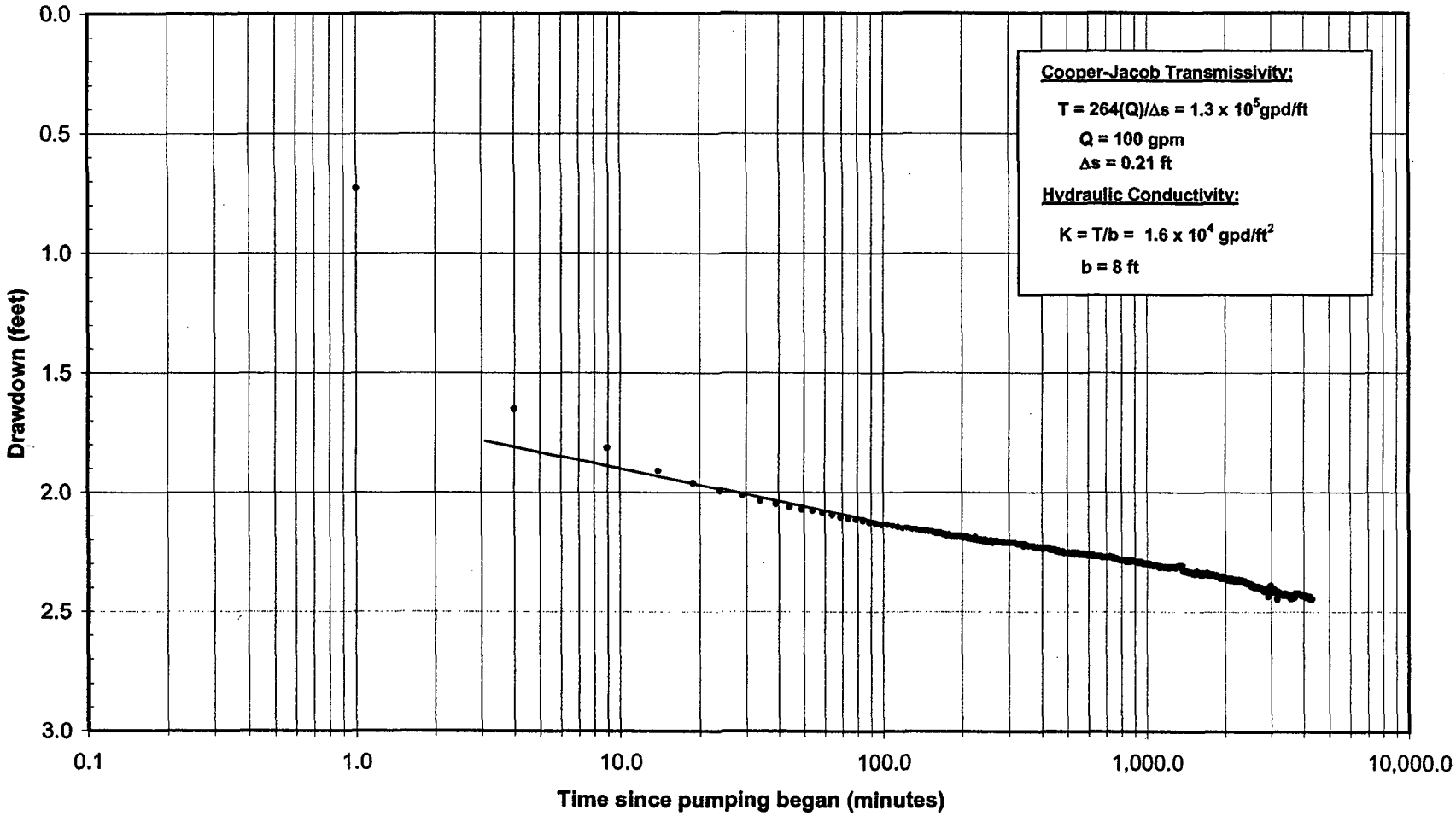

TW-3 72-Hour Constant-rate Pumping Test
Observation Well Point WP-3N
depth to water vs. time
Depth to Water (feet)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
TW-3 step tests #1 & #2
Aborted TW-3 72-Hr test
TW-3 step test #3
Start of TW-3 pumping test
End of TW-3 pumping test
5/2/2003 0:00
5/3/2003 0:00
5/4/2003 0:00
5/5/2003 0:00
5/6/2003 0:00
5/7/2003 0:00
5/8/2003 0:00
5/9/2003 0:00
5/10/2003 0:00
5/11/2003 0:00
5/12/2003 0:00
5/13/2003 0:00
5/14/2003 0:00
5/15/2003 0:00
5/16/2003 0:00
5/17/2003 0:00
Date

TW-2A 72 Hour Constant-Rate Pumping Test Data

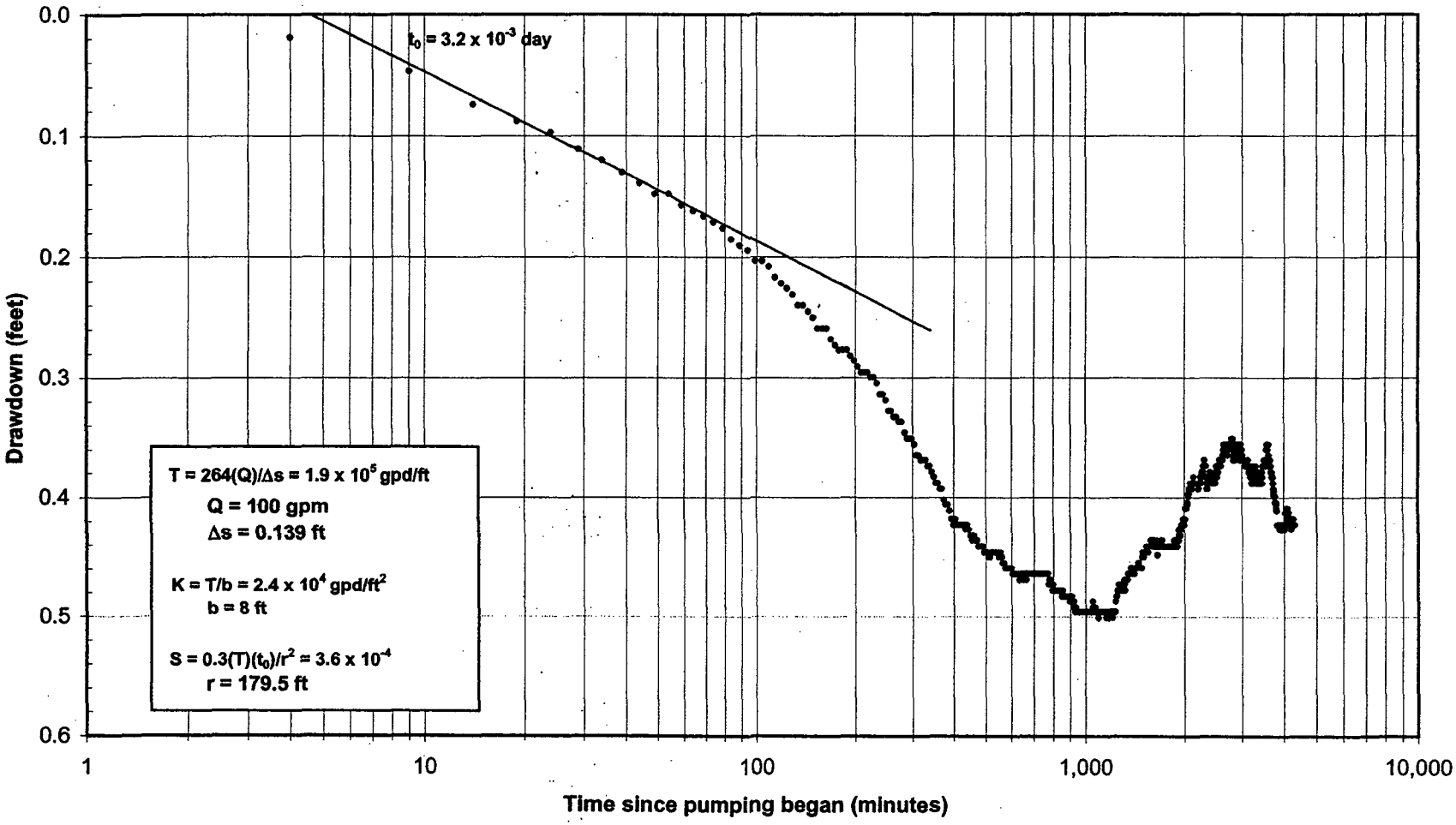
TW-2A 72-Hour Constant-rate Pumping Test
Test Well TW-2A
time vs. drawdown



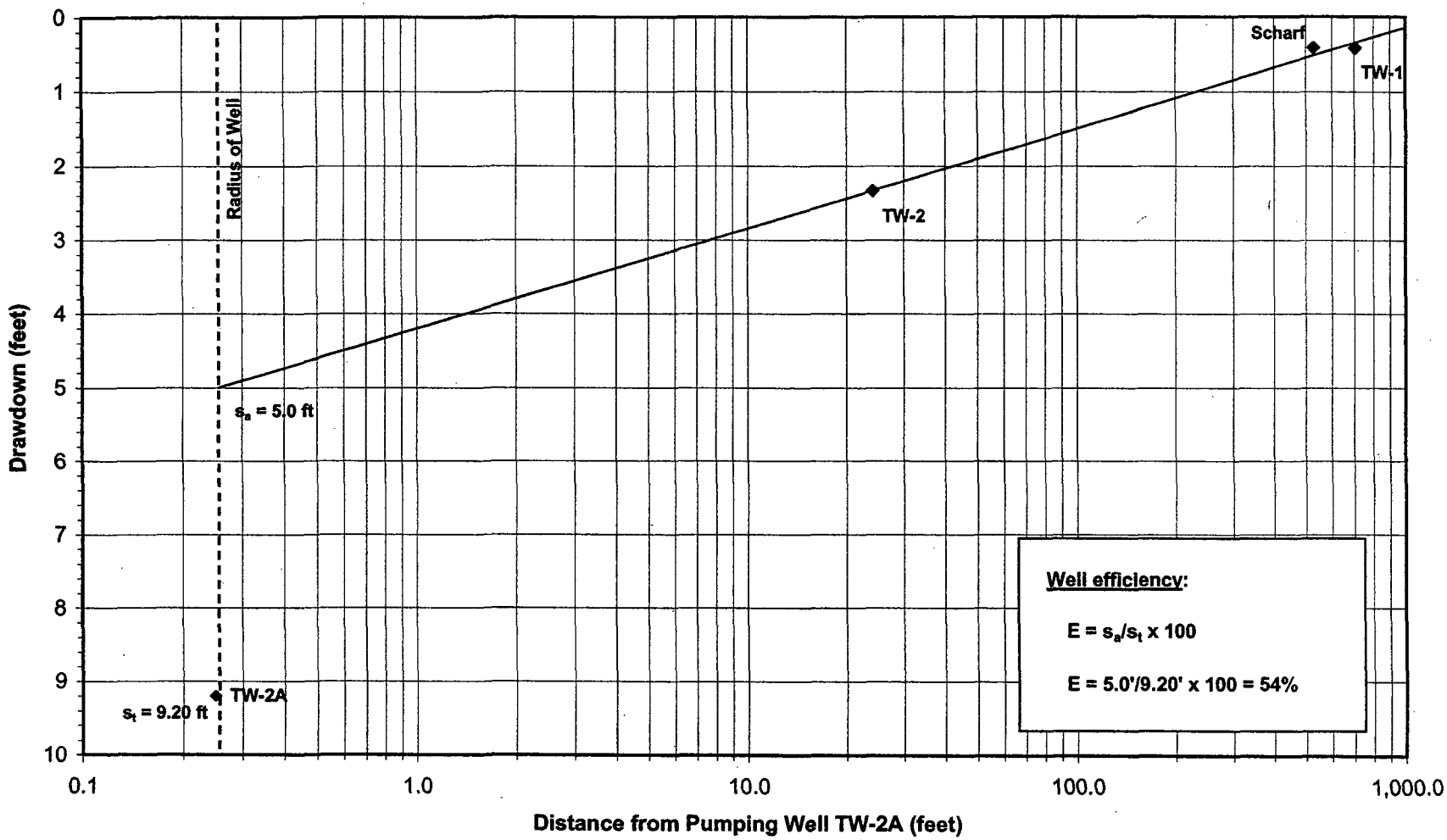
TW-2A 72-Hour Constant-rate Pumping Test
Observation Well TW-2
time vs. drawdown



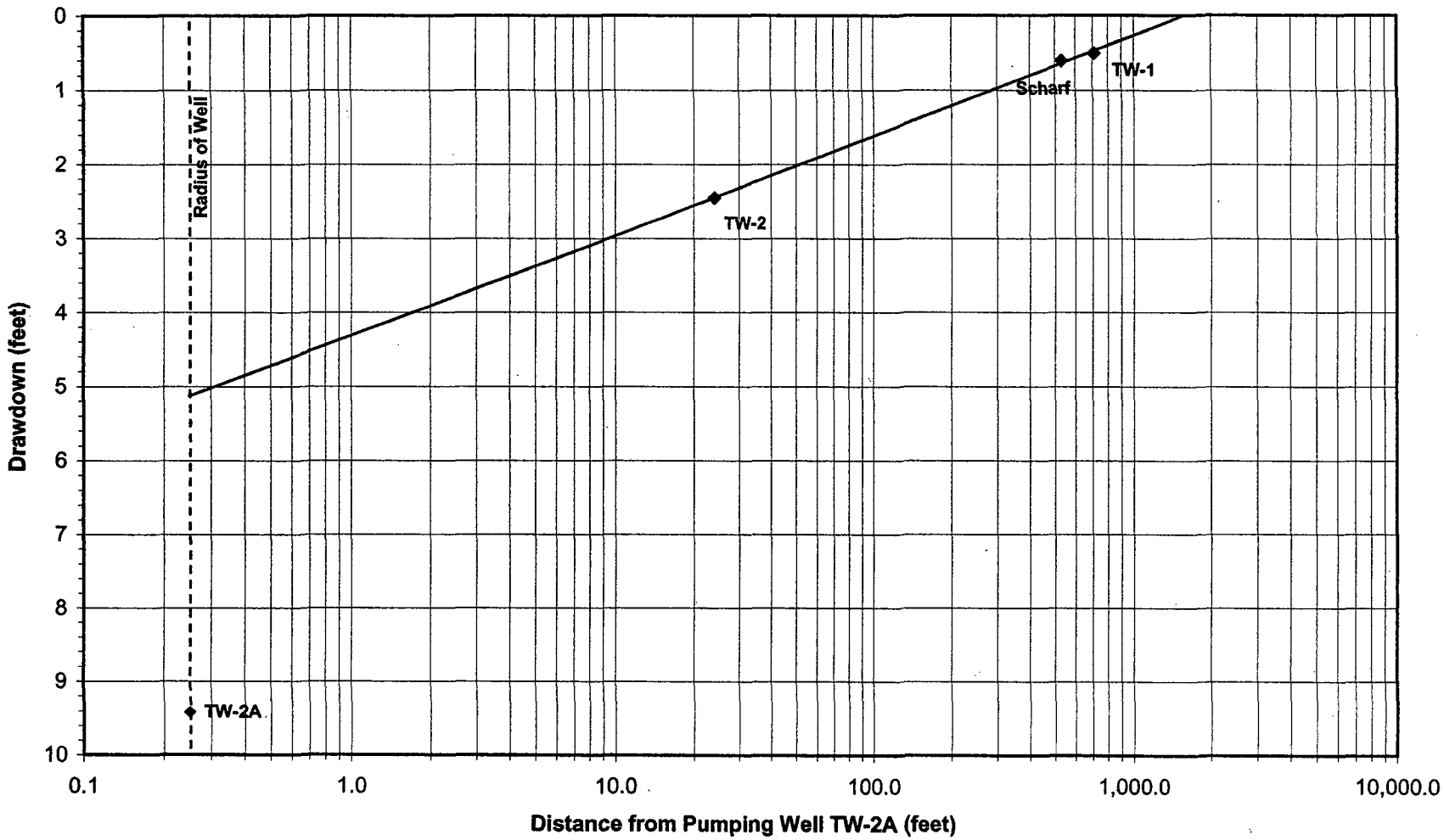
TW-2A 72-Hour Constant-rate Pumping Test
Observation Well TW-1
time vs. drawdown



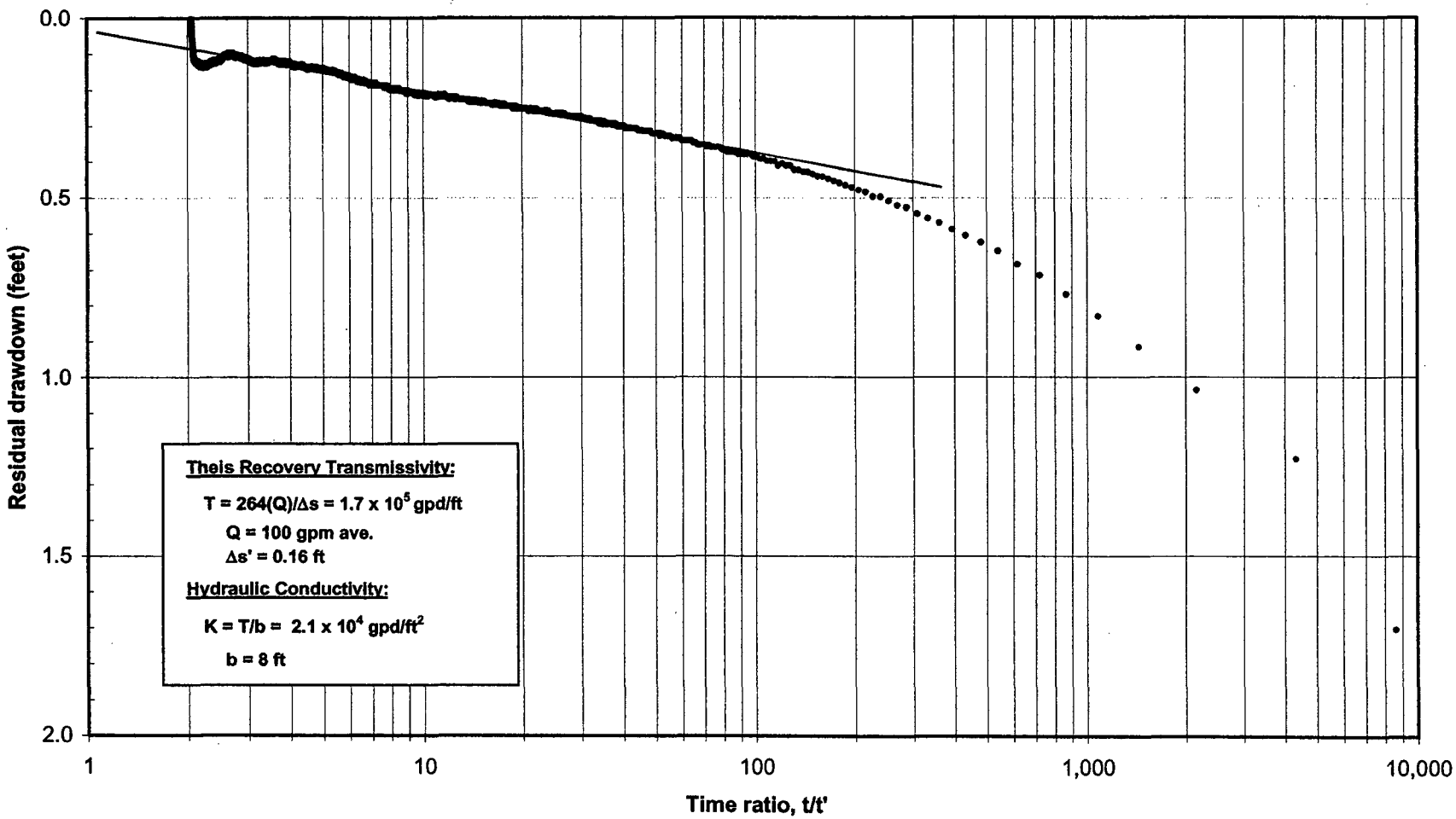
TW-2A 72-Hour Constant-rate Pumping Test
24-Hour Distance-drawdown



TW-2A 72-Hour Constant-rate Pumping Test
72-Hour Distance-drawdown



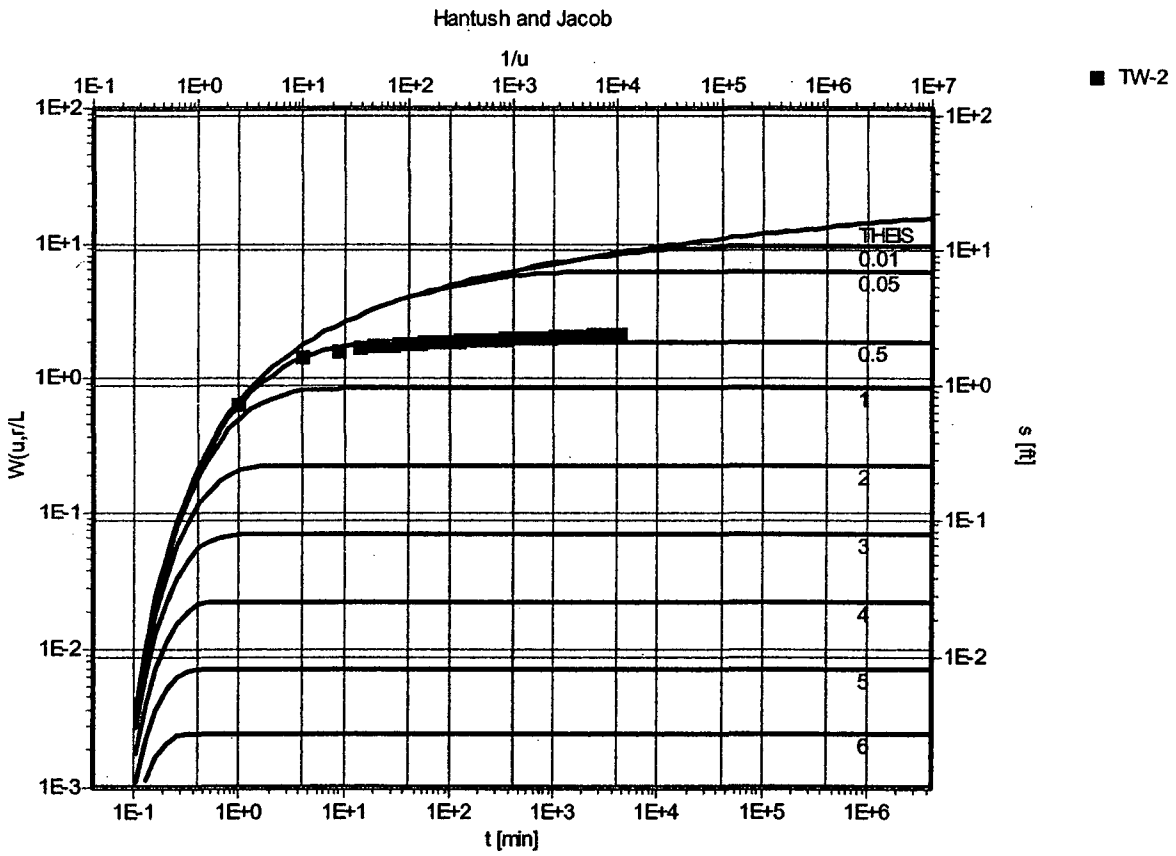
TW-2A 72-Hour Constant-rate Pumping Test
TW-2A Recovery Analysis
time ratio vs. residual drawdown



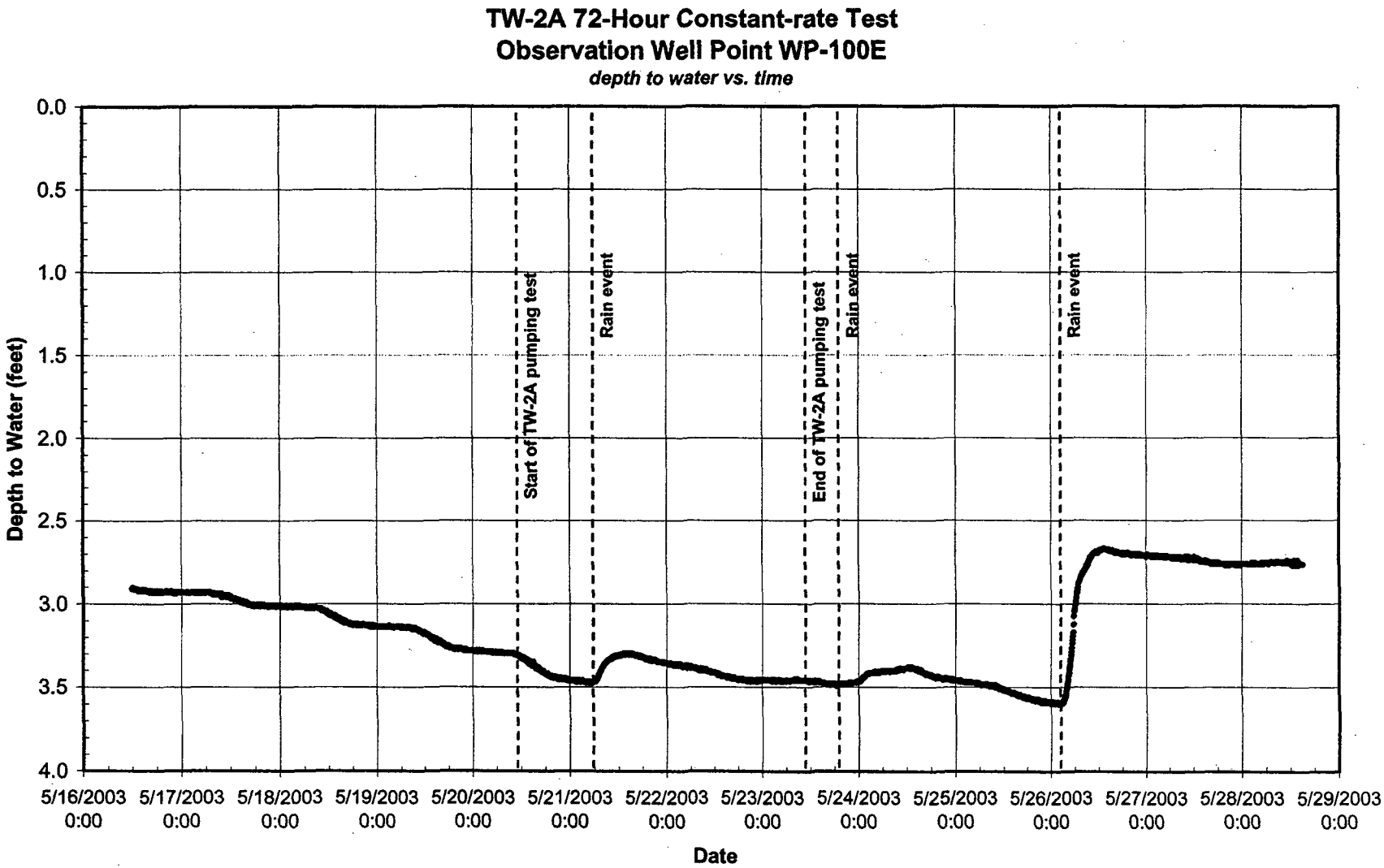
GROUNDWATER SCIENCES CORPORATION 2601 Market Place Street, Suite 310 Harrisburg, PA 17110	**Pumping test analysis** **No:** *01003.10.0203* **Project:** *Shenandoah Road Alternative Water Supply* **Client:** *IBM*

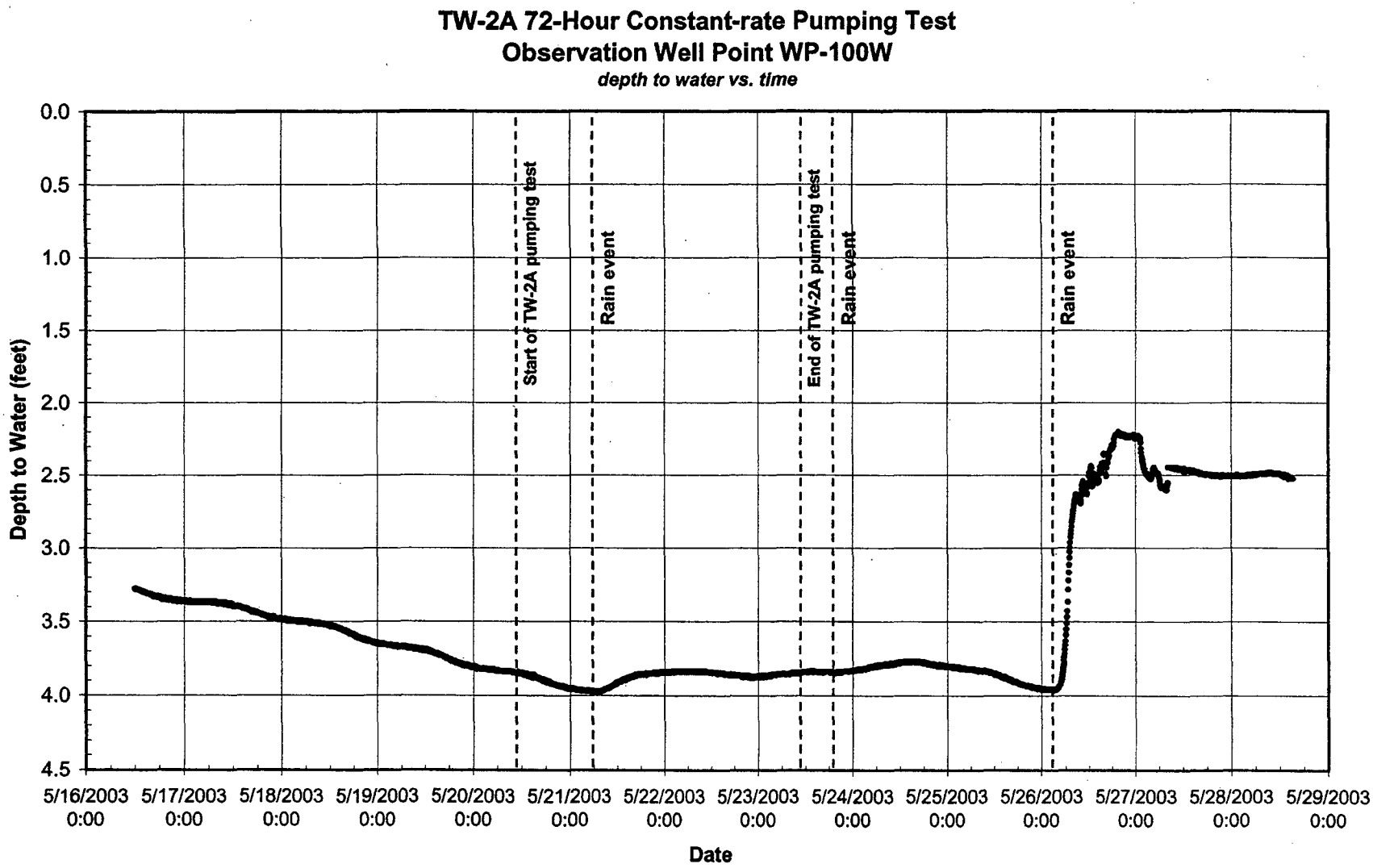
Location *Shenandoah Road, Fishkill, NY*	**Pumping test:** *TW-2A*	**Pumping well:** *TW-2A*

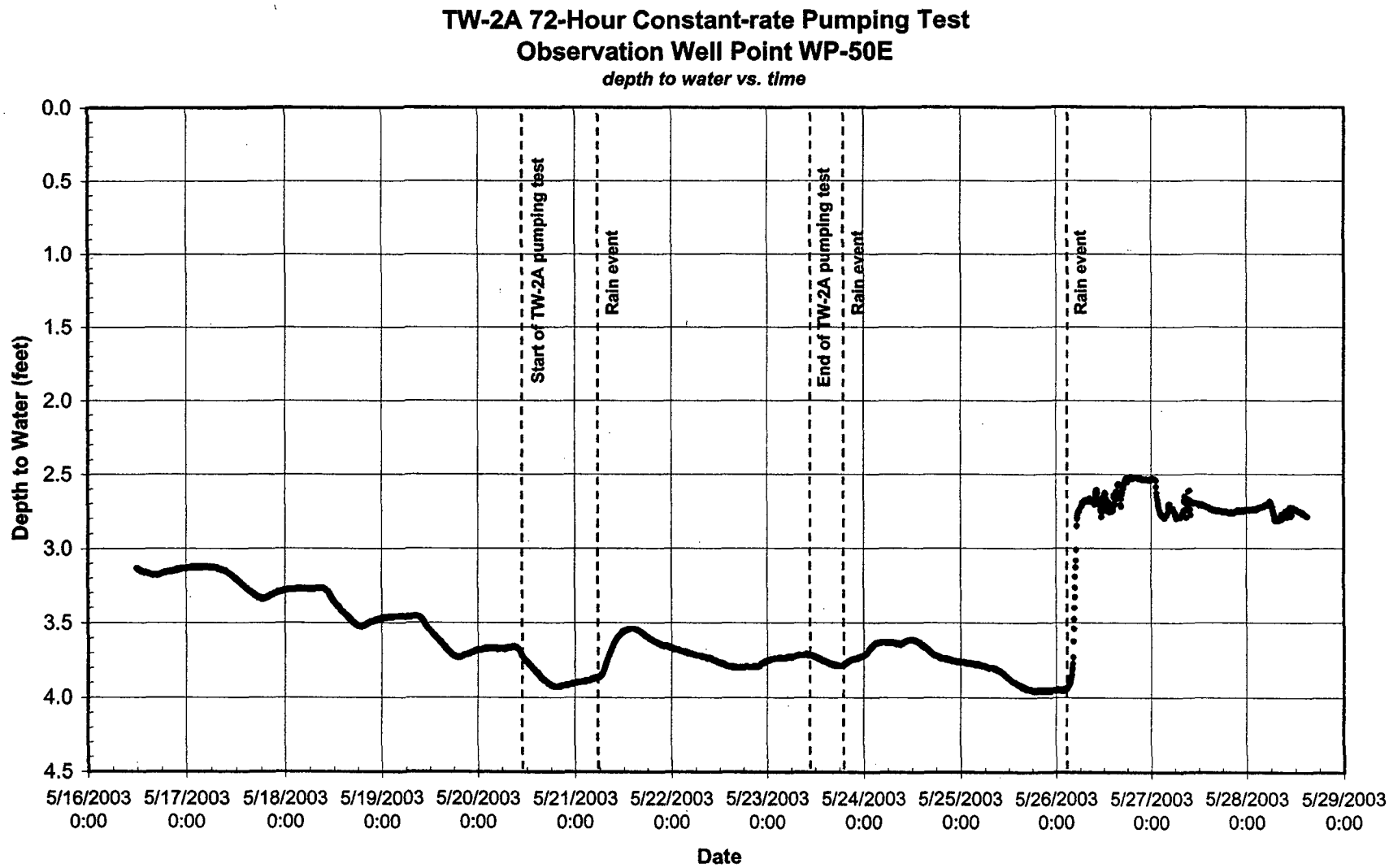
Test performed by: **Test date:** *7/7/2003*	**Evaluated by:** **Evaluation date:** *7/7/2003*
Analysis *Hantush and Jacob*	**Aquifer thickness:** *8 [ft]* **Discharge** *100 [U.S. gal/min]*

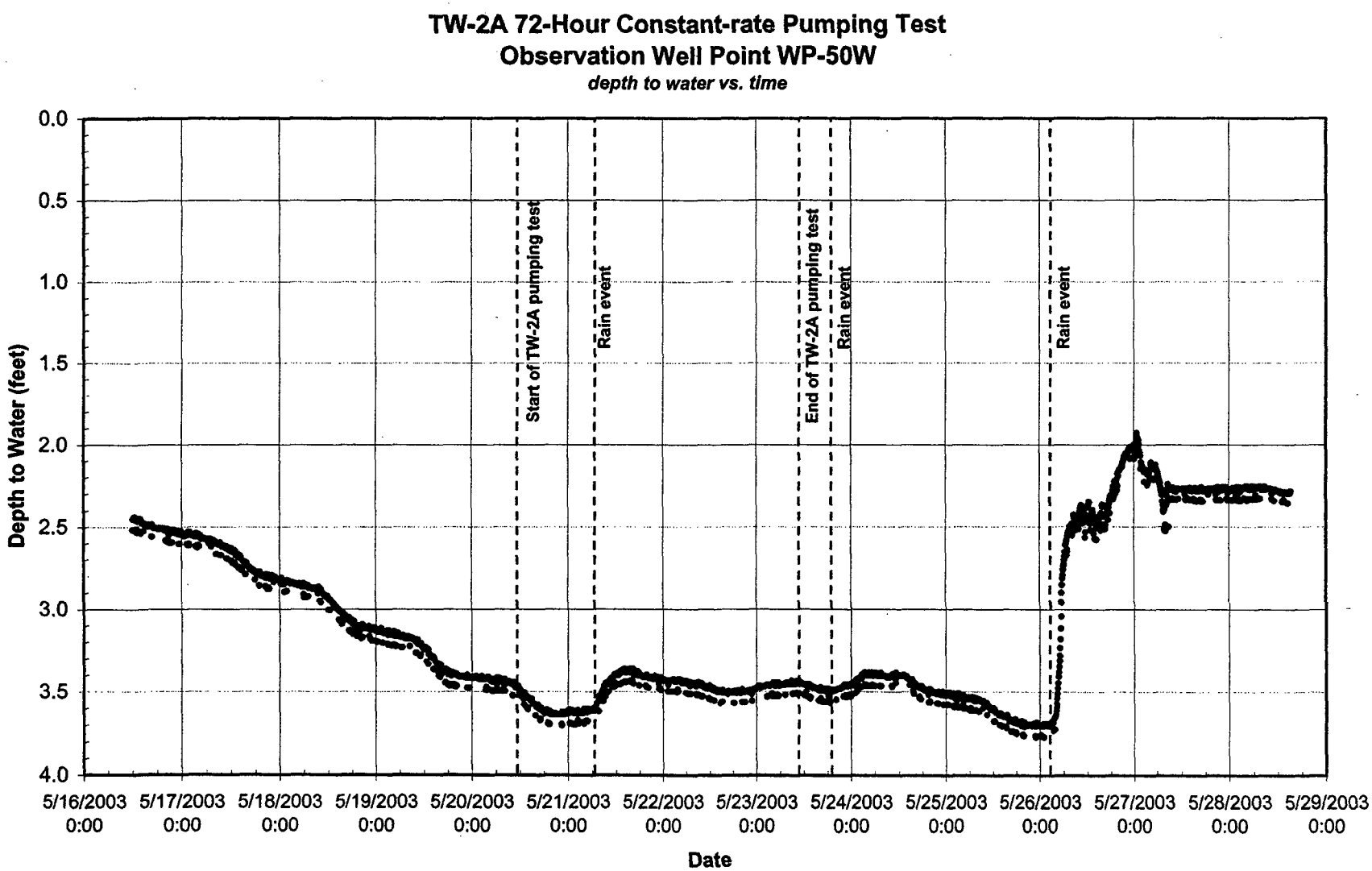


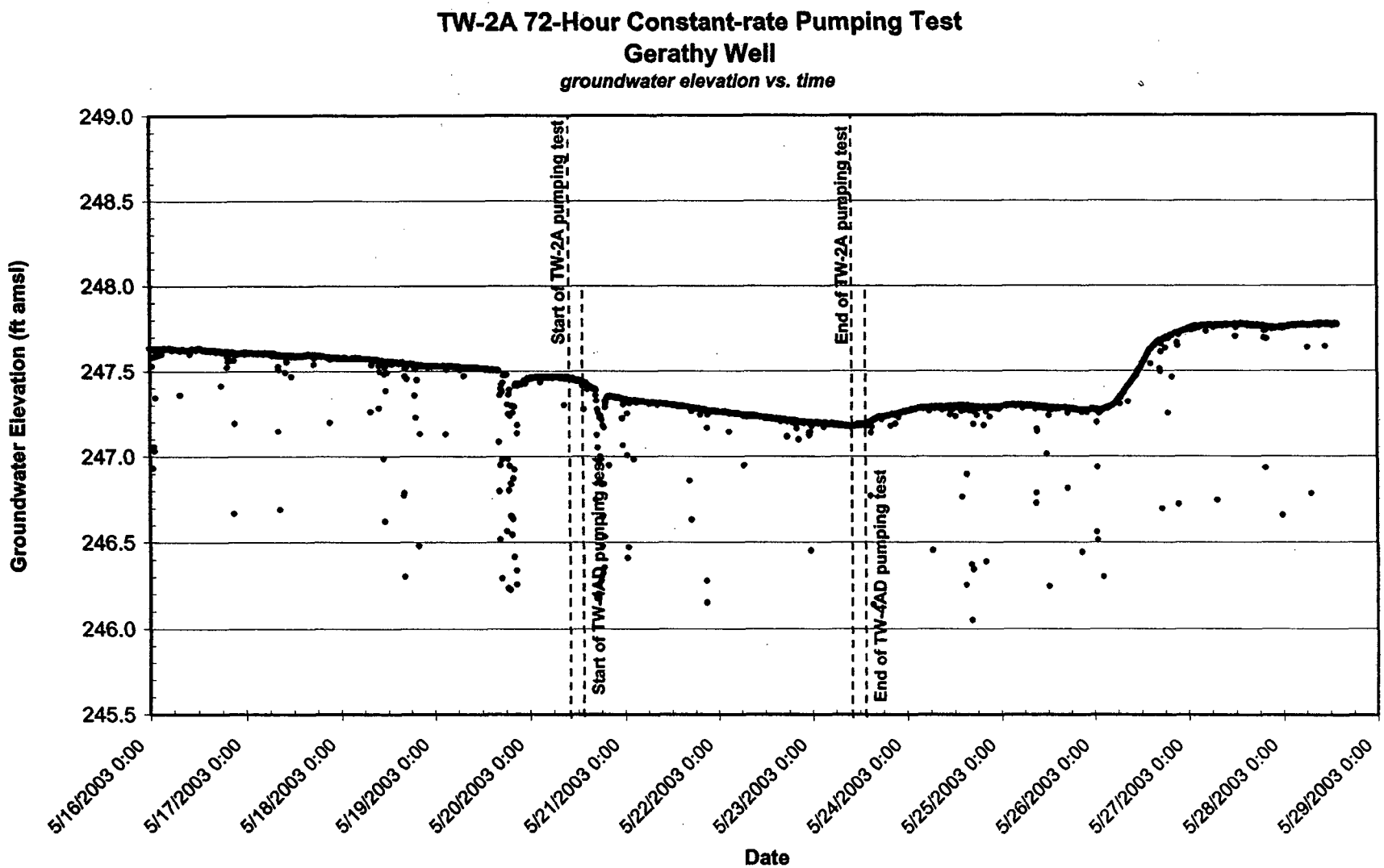
Transmissivity:	1.35×10^+3 [ft²/d]
Conductivity:	1.69×10^+2 [ft/d]
Storativity:	2.62×10^-3
c :	6.22×10^+6 [min]

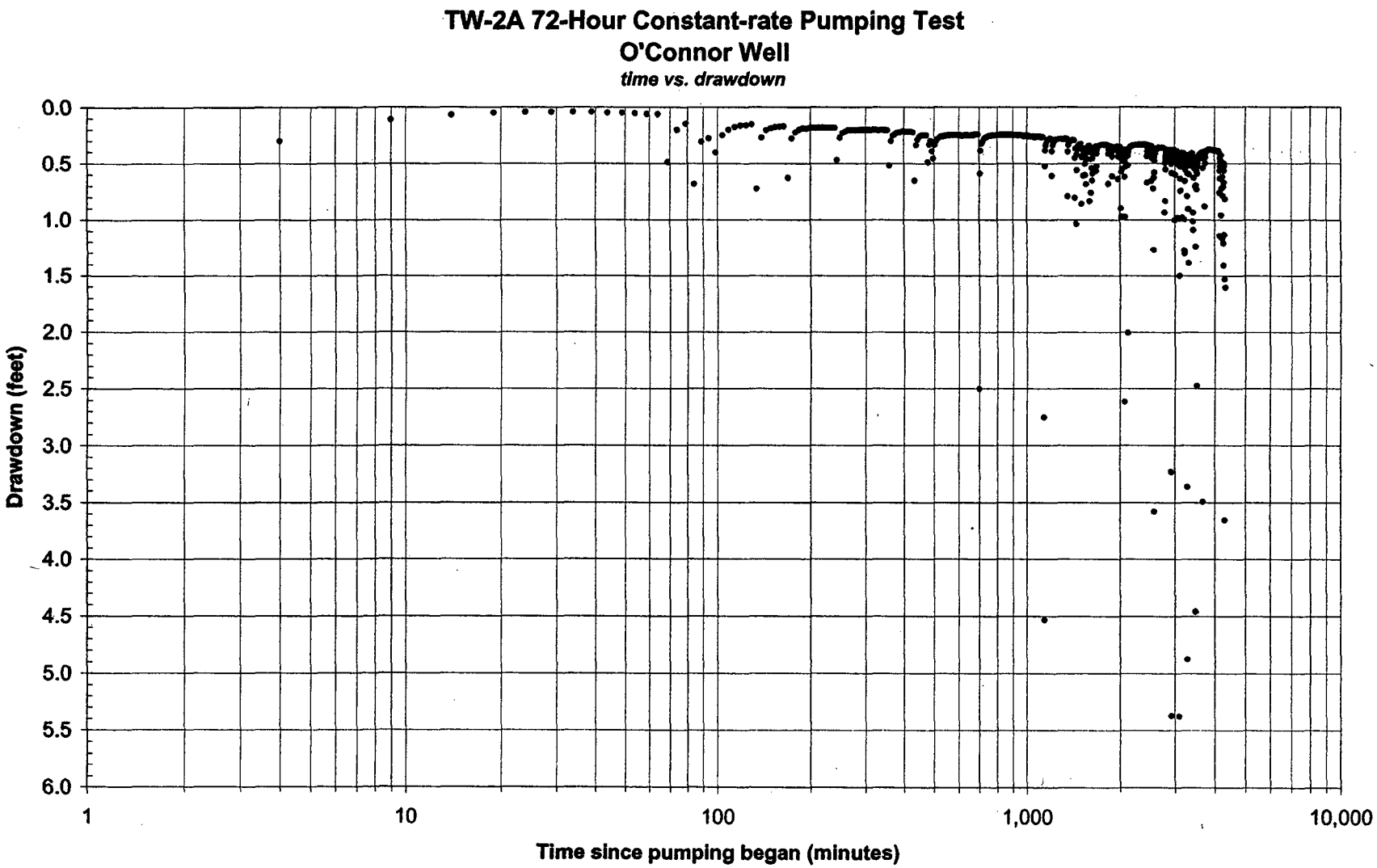

TW-2A 72-Hour Constant-rate Test
Observation Well Point WP-100E
depth to water vs. time
Depth to Water (feet)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Start of TW-2A pumping test
Rain event
End of TW-2A pumping test
Rain event
Rain event
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

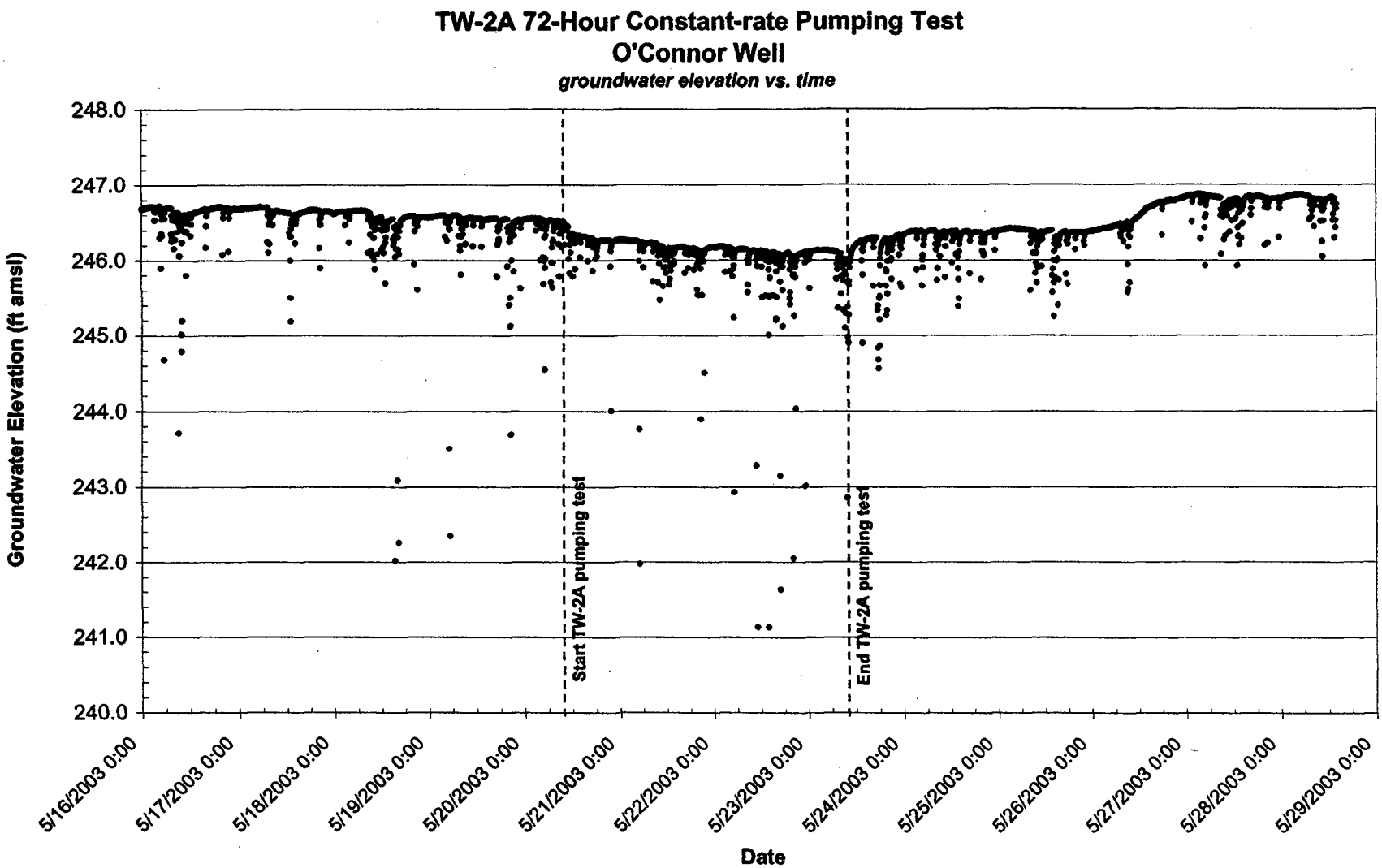

TW-2A 72-Hour Constant-rate Pumping Test
Observation Well Point WP-100W
depth to water vs. time
Depth to Water (feet)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
Start of TW-2A pumping test
Rain event
End of TW-2A pumping test
Rain event
Rain event
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

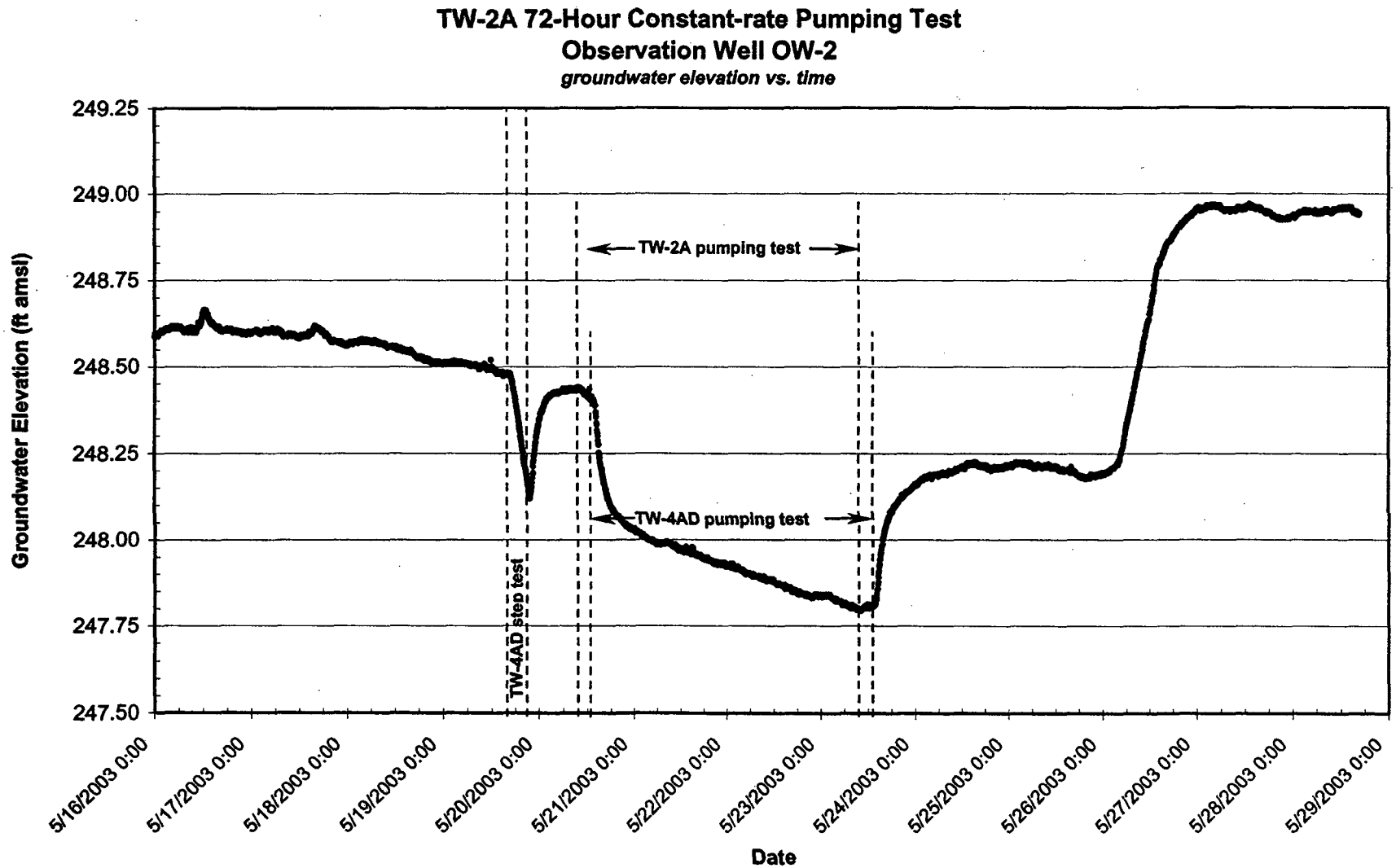

TW-2A 72-Hour Constant-rate Pumping Test
Observation Well Point WP-50E
depth to water vs. time
Depth to Water (feet)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
Start of TW-2A pumping test
Rain event
End of TW-2A pumping test
Rain event
Rain event
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

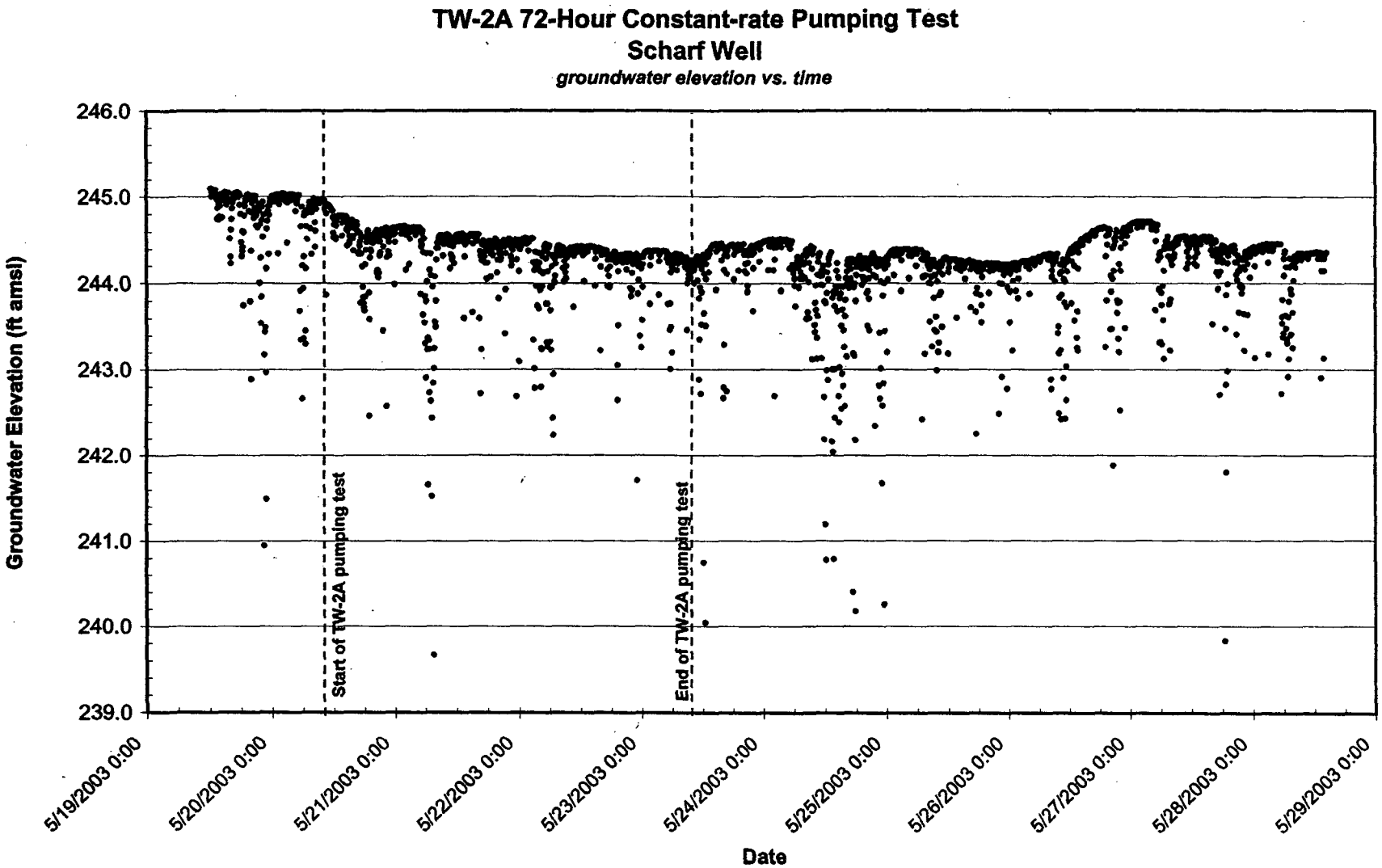

TW-2A 72-Hour Constant-rate Pumping Test
Observation Well Point WP-50W
depth to water vs. time
Depth to Water (feet)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Start of TW-2A pumping test
Rain event
End of TW-2A pumping test
Rain event
Rain event
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

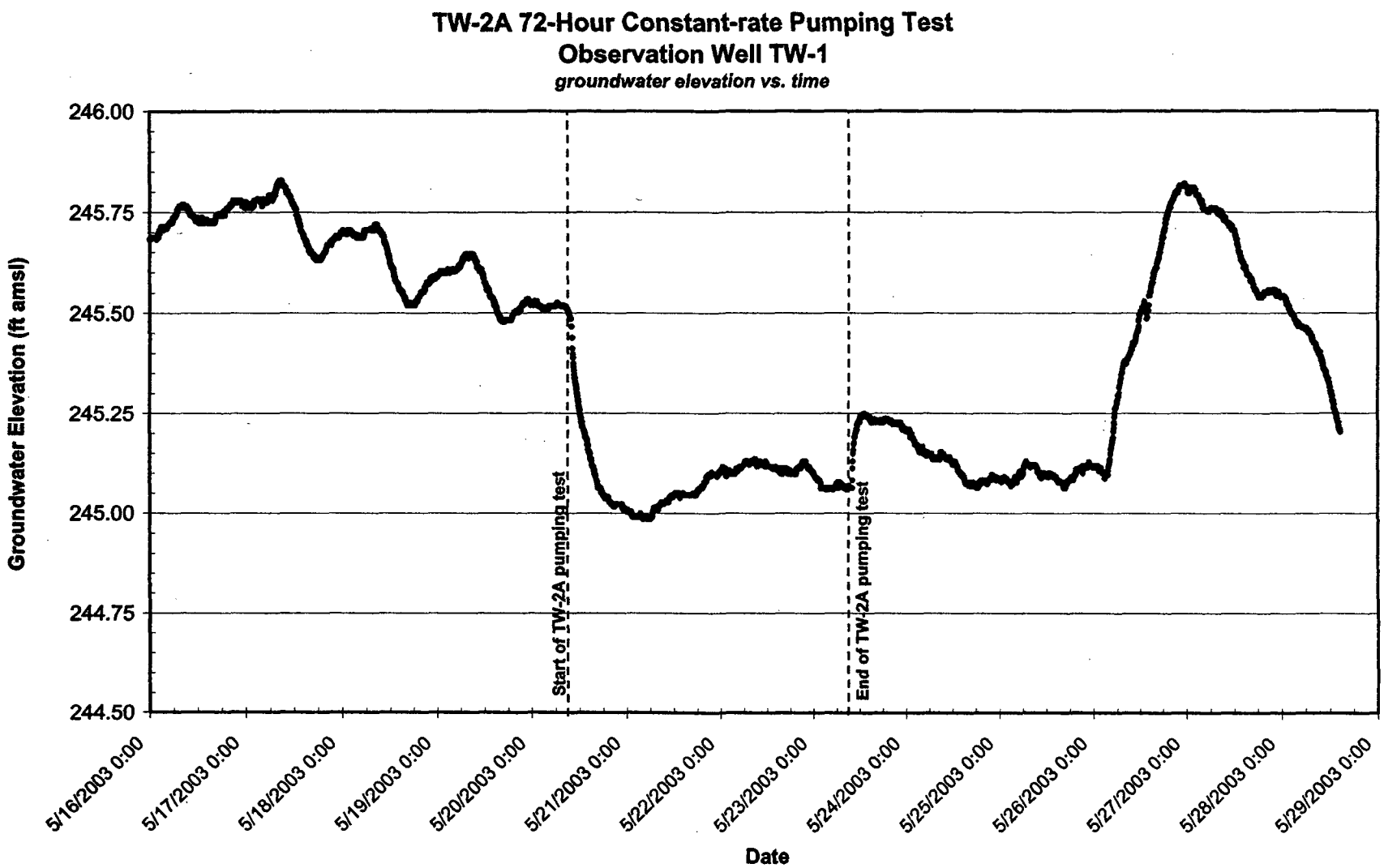

TW-2A 72-Hour Constant-rate Pumping Test
Gerathy Well
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
249.0
248.5
248.0
247.5
247.0
246.5
246.0
245.5
Start of TW-2A pumping test
Start of TW-4AD pumping test
End of TW-2A pumping test
End of TW-4AD pumping test
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

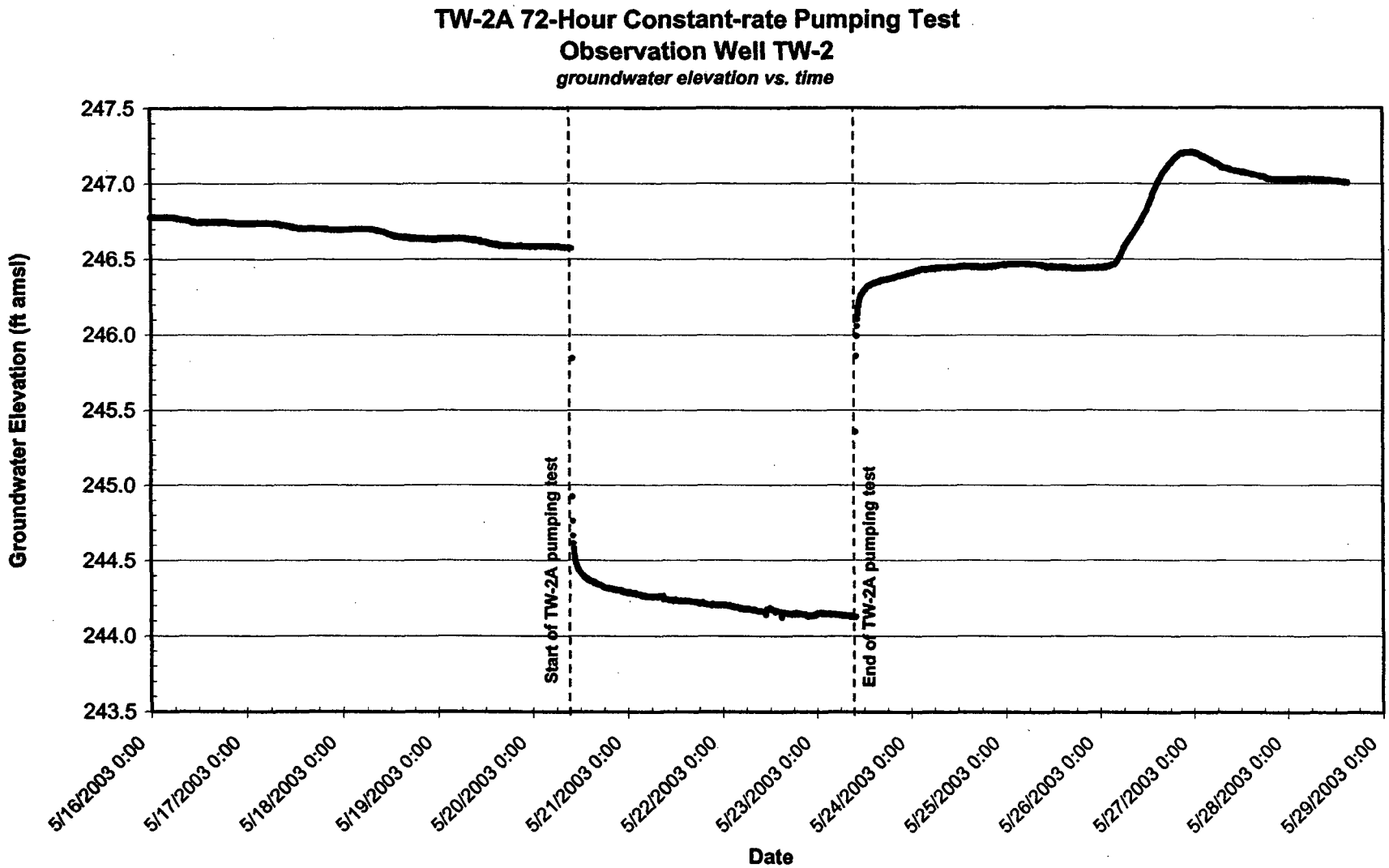

TW-2A 72-Hour Constant-rate Pumping Test
O'Connor Well
time vs. drawdown
Drawdown (feet)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
1
10
100
1,000
10,000
Time since pumping began (minutes)

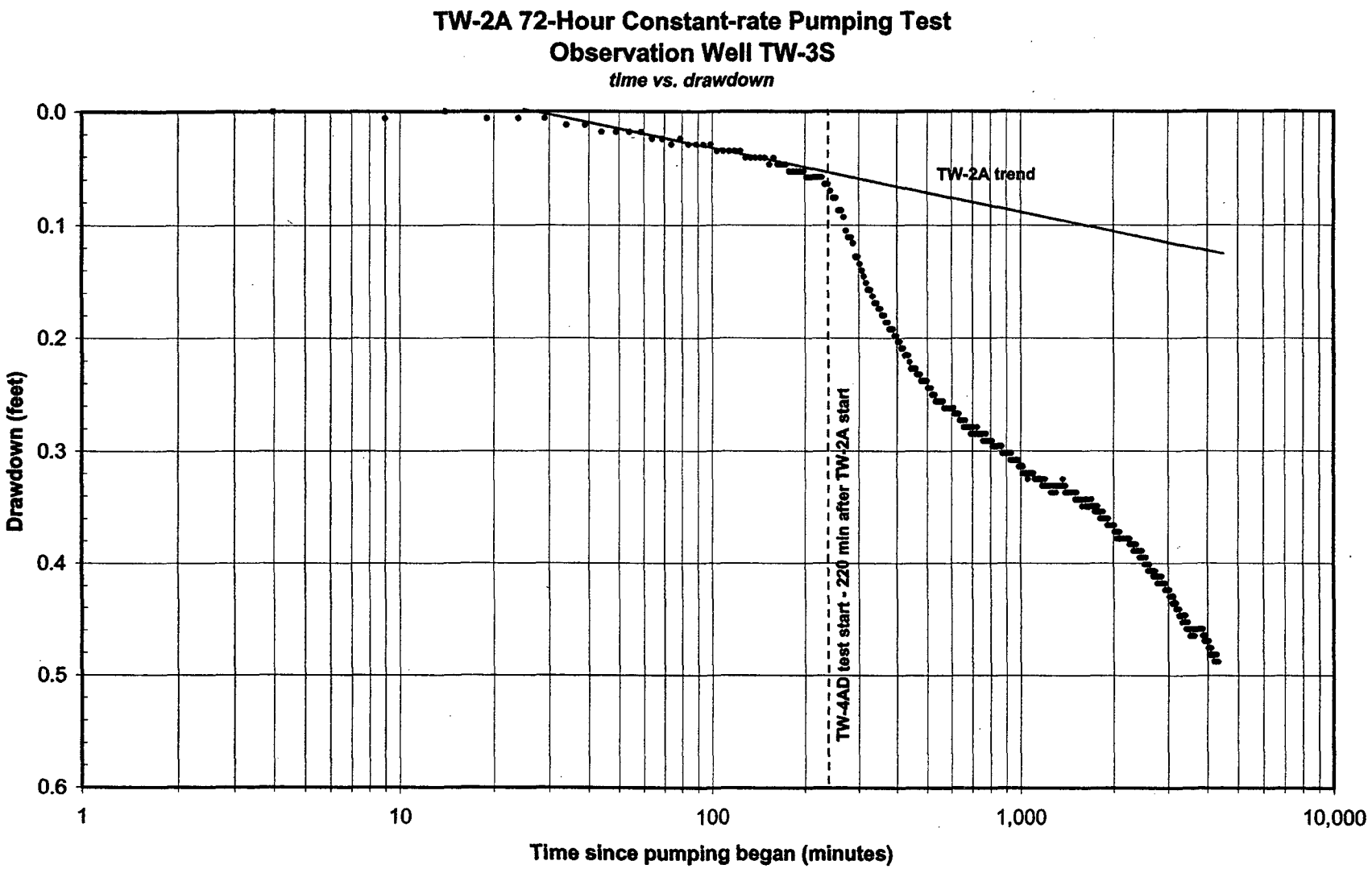

TW-2A 72-Hour Constant-rate Pumping Test
O'Connor Well
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
248.0
247.0
246.0
245.0
244.0
243.0
242.0
241.0
240.0
Start TW-2A pumping test
End TW-2A pumping test
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

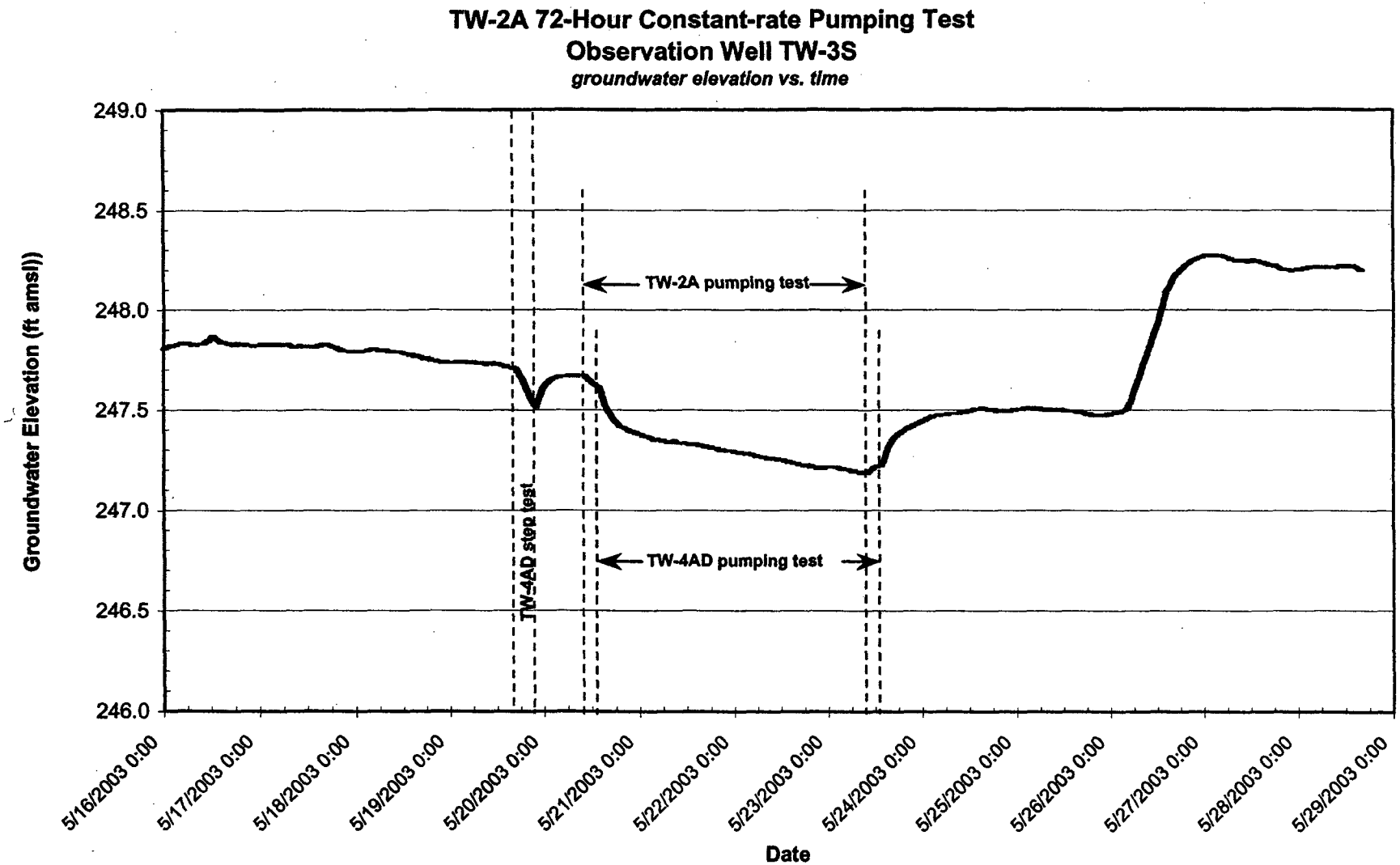

TW-2A 72-Hour Constant-rate Pumping Test
Observation Well OW-2
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
249.25
249.00
248.75
248.50
248.25
248.00
247.75
247.50
TW-2A pumping test
TW-4AD pumping test
TW-4AD step test
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

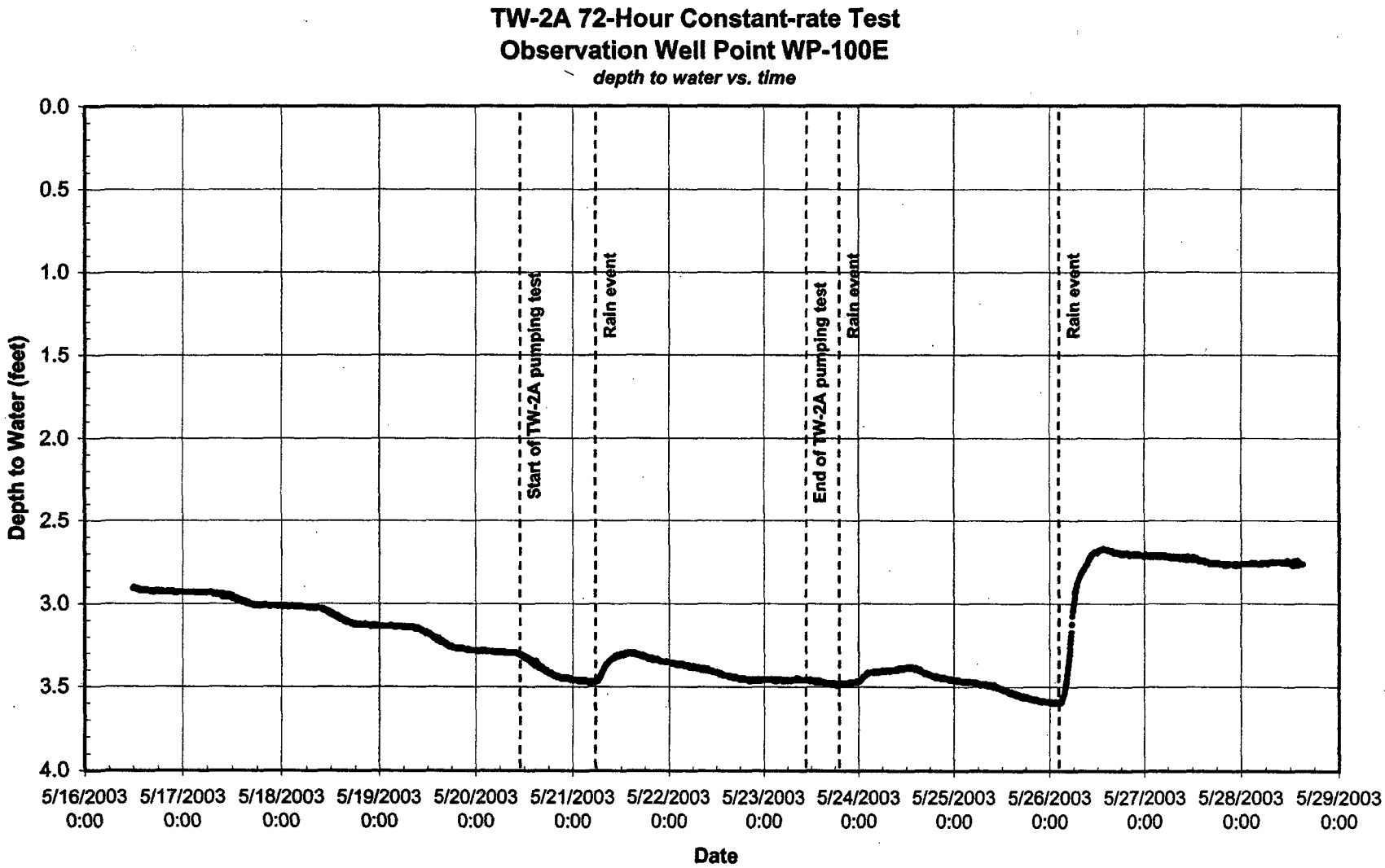

TW-2A 72-Hour Constant-rate Pumping Test
Scharf Well
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
246.0
245.0
244.0
243.0
242.0
241.0
240.0
239.0
Start of TW-2A pumping test
End of TW-2A pumping test
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

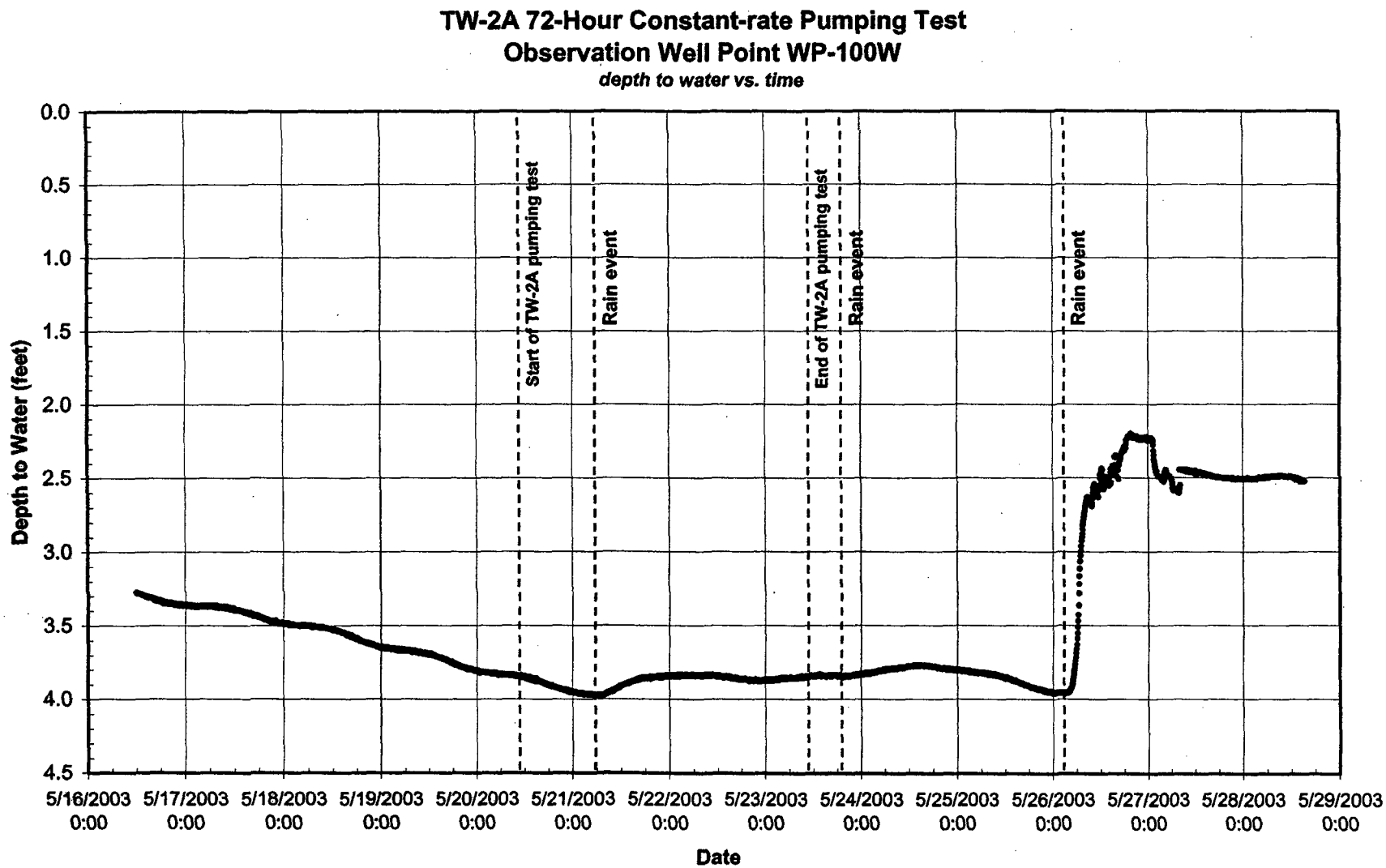

TW-2A 72-Hour Constant-rate Pumping Test
Observation Well TW-1
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
246.00
245.75
245.50
245.25
245.00
244.75
244.50
Start of TW-2A pumping test
End of TW-2A pumping test
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

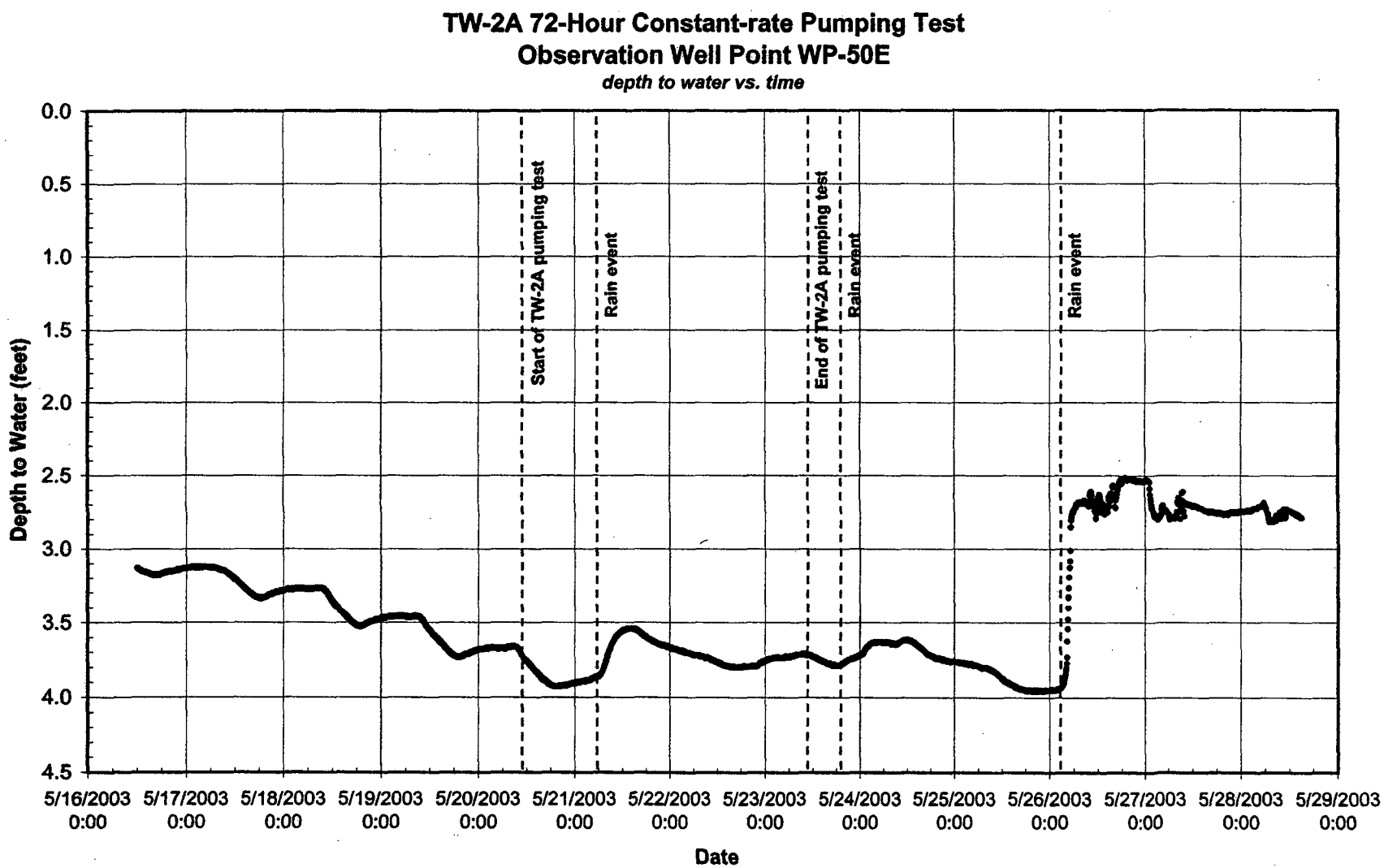

TW-2A 72-Hour Constant-rate Pumping Test
Observation Well TW-2
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
247.5
247.0
246.5
246.0
245.5
245.0
244.5
244.0
243.5
Start of TW-2A pumping test
End of TW-2A pumping test
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date


TW-2A 72-Hour Constant-rate Pumping Test
Observation Well TW-3S
time vs. drawdown
Drawdown (feet)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
1
10
100
1,000
10,000
Time since pumping began (minutes)
TW-2A trend
TW-4AD test start - 220 min after TW-2A start


TW-2A 72-Hour Constant-rate Pumping Test
Observation Well TW-3S
groundwater elevation vs. time
Groundwater Elevation (ft amsl))
249.0
248.5
248.0
247.5
247.0
246.5
246.0
TW-2A pumping test
TW-4AD step test
TW-4AD pumping test
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date


TW-2A 72-Hour Constant-rate Test
Observation Well Point WP-100E
depth to water vs. time
Depth to Water (feet)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Start of TW-2A pumping test
Rain event
End of TW-2A pumping test
Rain event
Rain event
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date


TW-2A 72-Hour Constant-rate Pumping Test
Observation Well Point WP-100W
depth to water vs. time
Depth to Water (feet)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
Start of TW-2A pumping test
Rain event
End of TW-2A pumping test
Rain event
Rain event
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date


TW-2A 72-Hour Constant-rate Pumping Test
Observation Well Point WP-50E
depth to water vs. time
Depth to Water (feet)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
Start of TW-2A pumping test
Rain event
End of TW-2A pumping test
Rain event
Rain event
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
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5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
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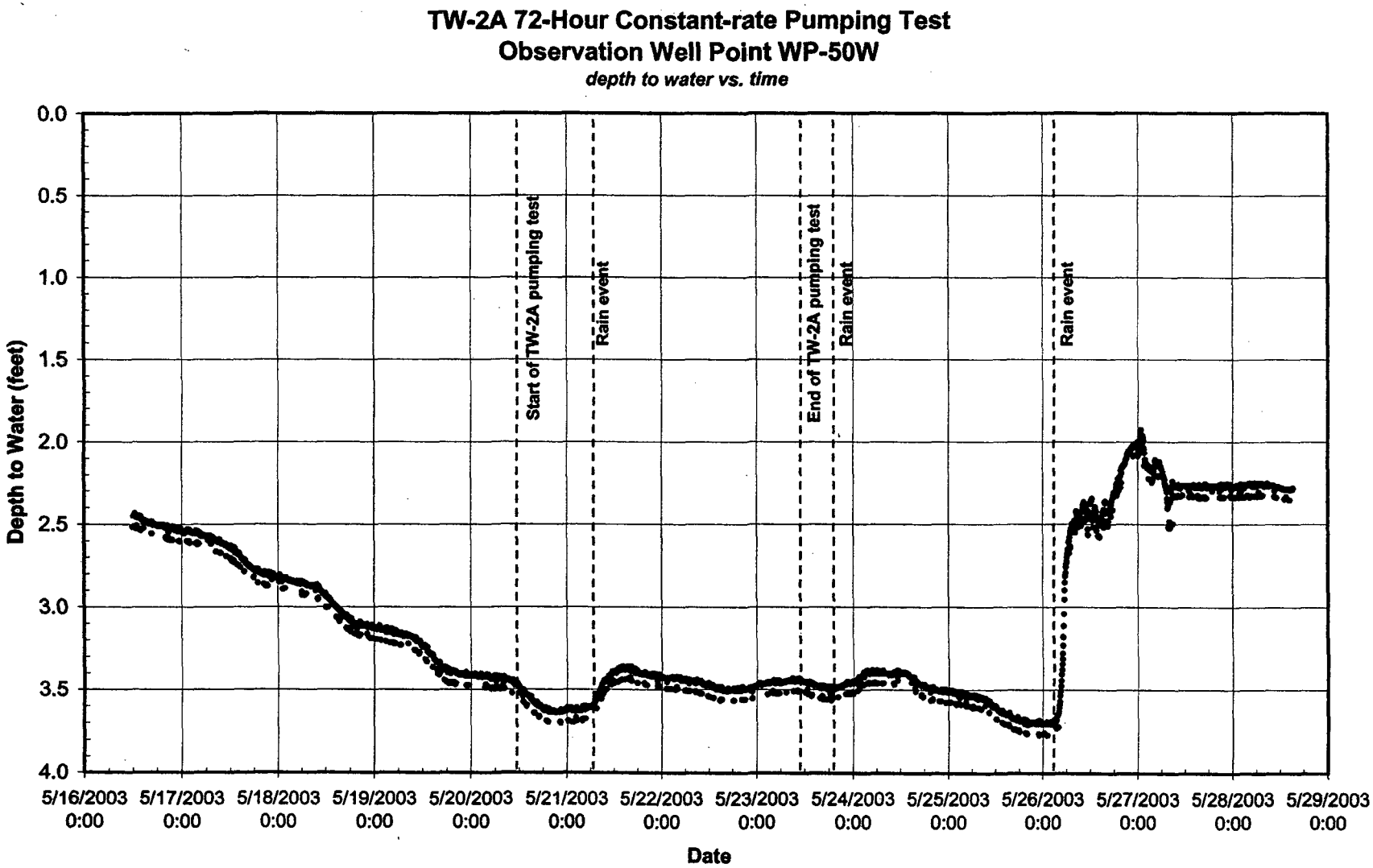
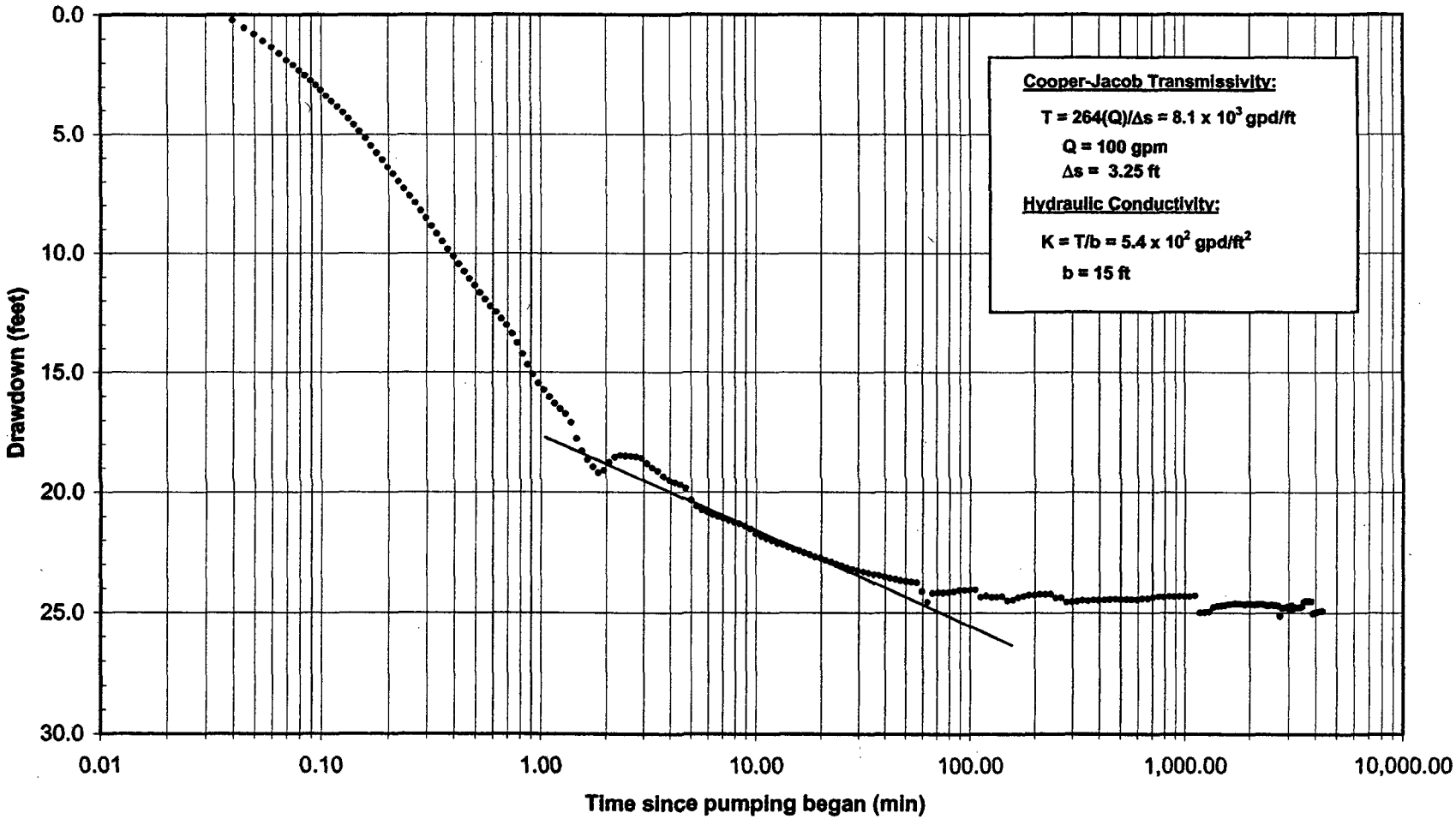
Date

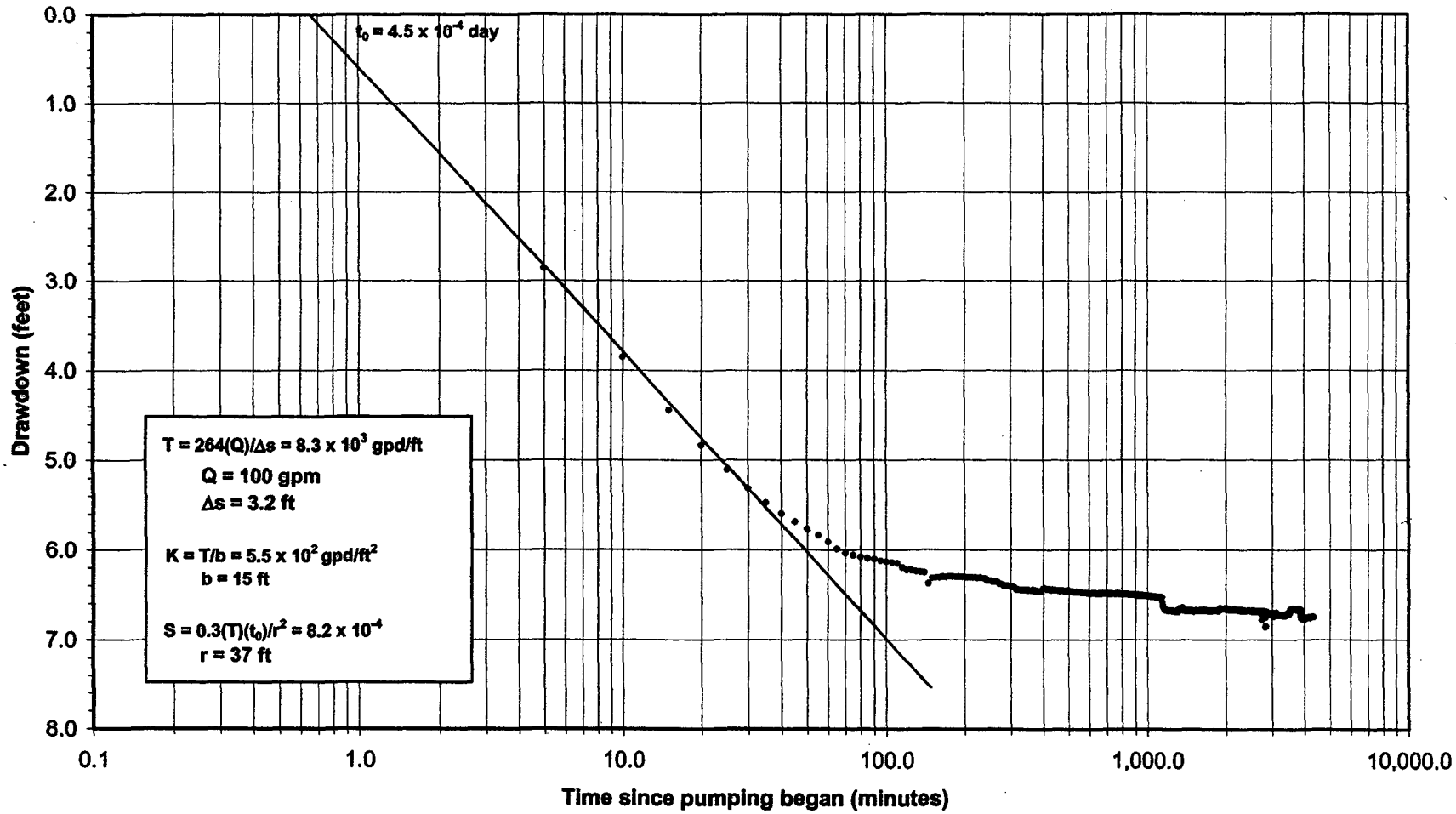

TW-2A 72-Hour Constant-rate Pumping Test
Observation Well Point WP-50W
depth to water vs. time
Depth to Water (feet)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Start of TW-2A pumping test
Rain event
End of TW-2A pumping test
Rain event
Rain event
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

TW-4AD 72 Hour Constant-Rate Pumping Test #1 Data

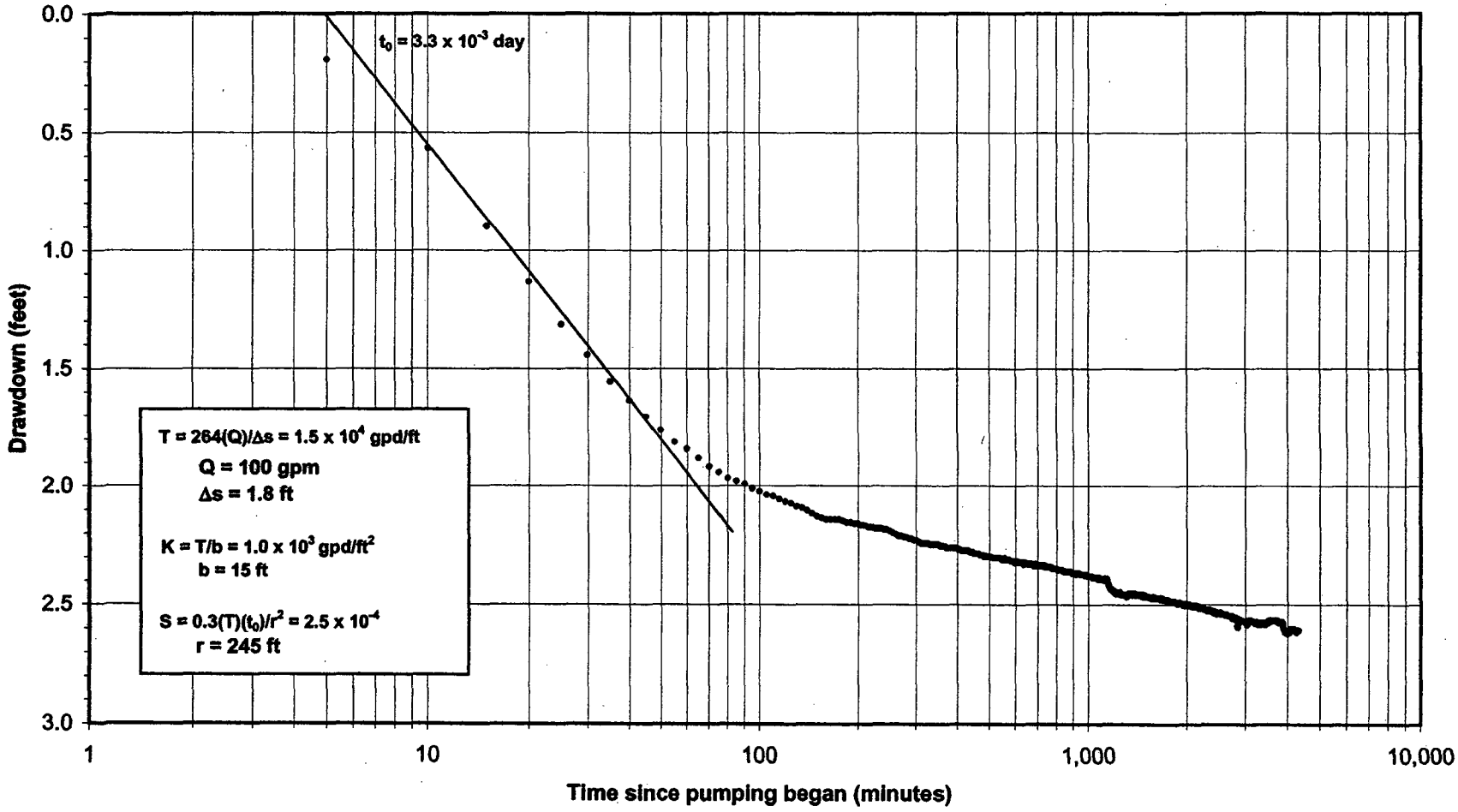
TW-4AD 72-Hour Constant-rate Pumping Test #1
Test Well TW-4AD
time vs. drawdown



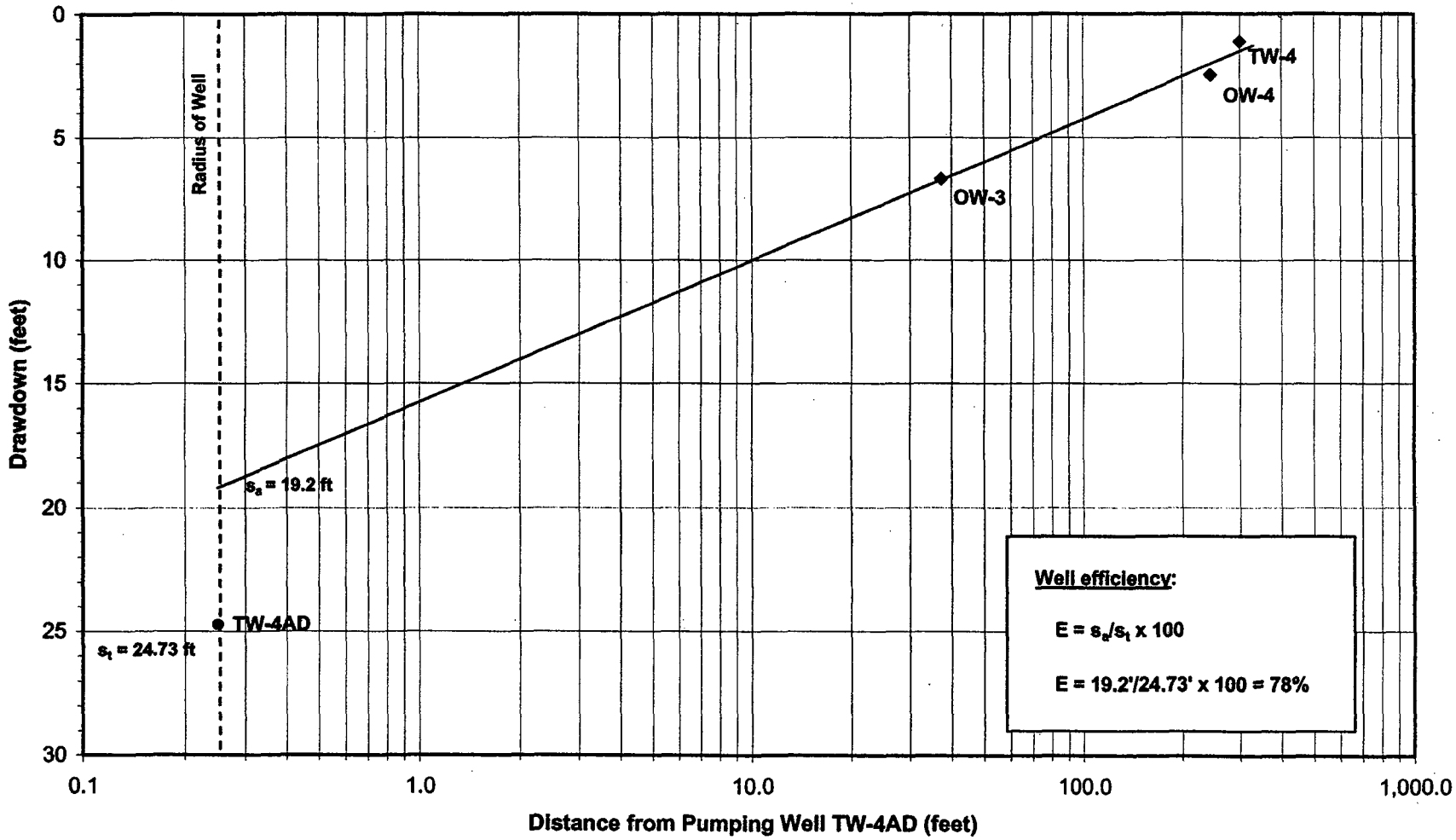
TW-4AD 72-Hour Constant-rate Pumping Test #1
Observation Well OW-3
time vs. drawdown



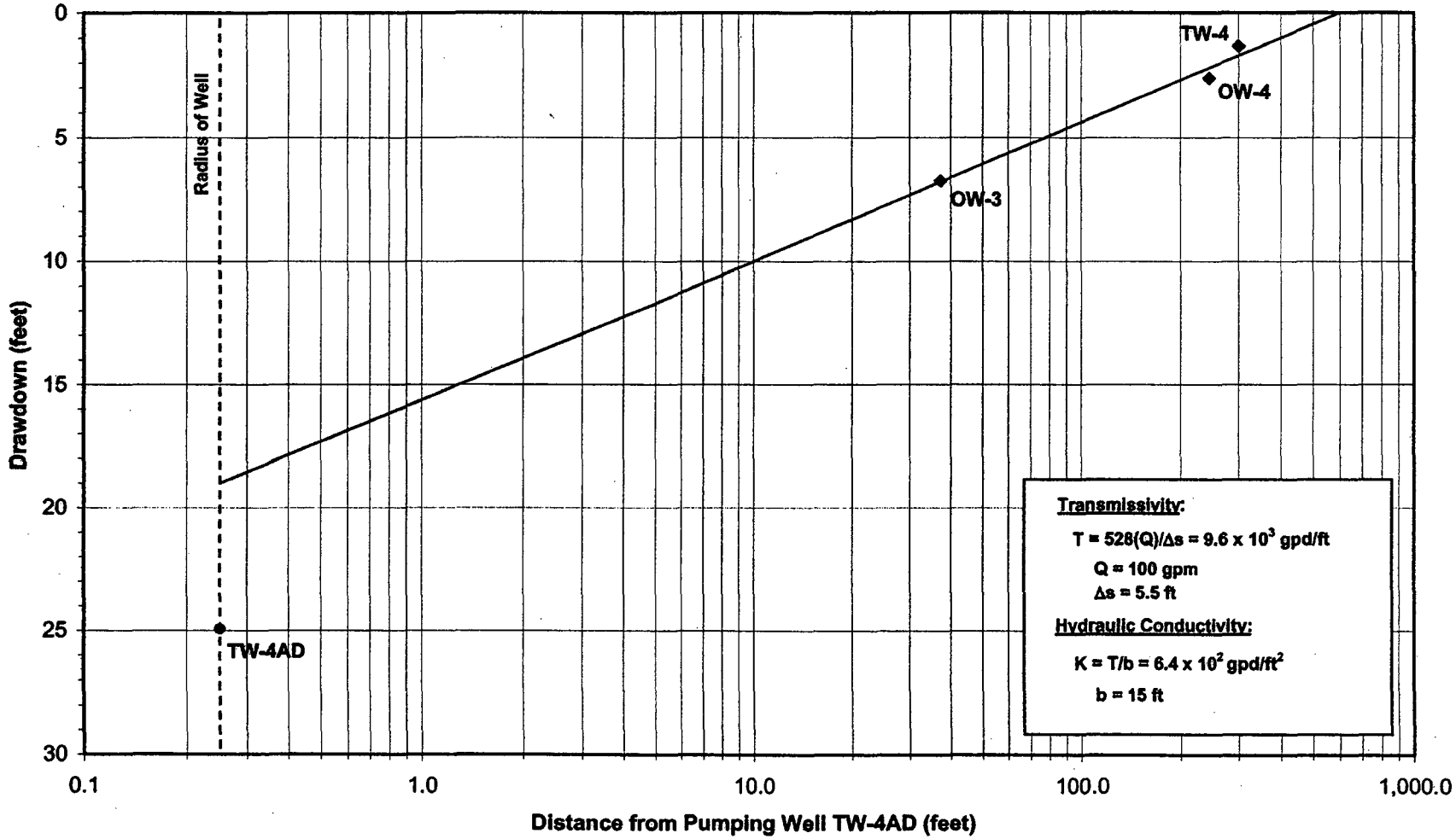
TW-4AD 72-Hour Constant-rate Pumping Test #1
Observation Well OW-4
time vs. drawdown



TW-4AD 72-Hour Constant-rate Pumping Test #1
24-Hour Distance-drawdown



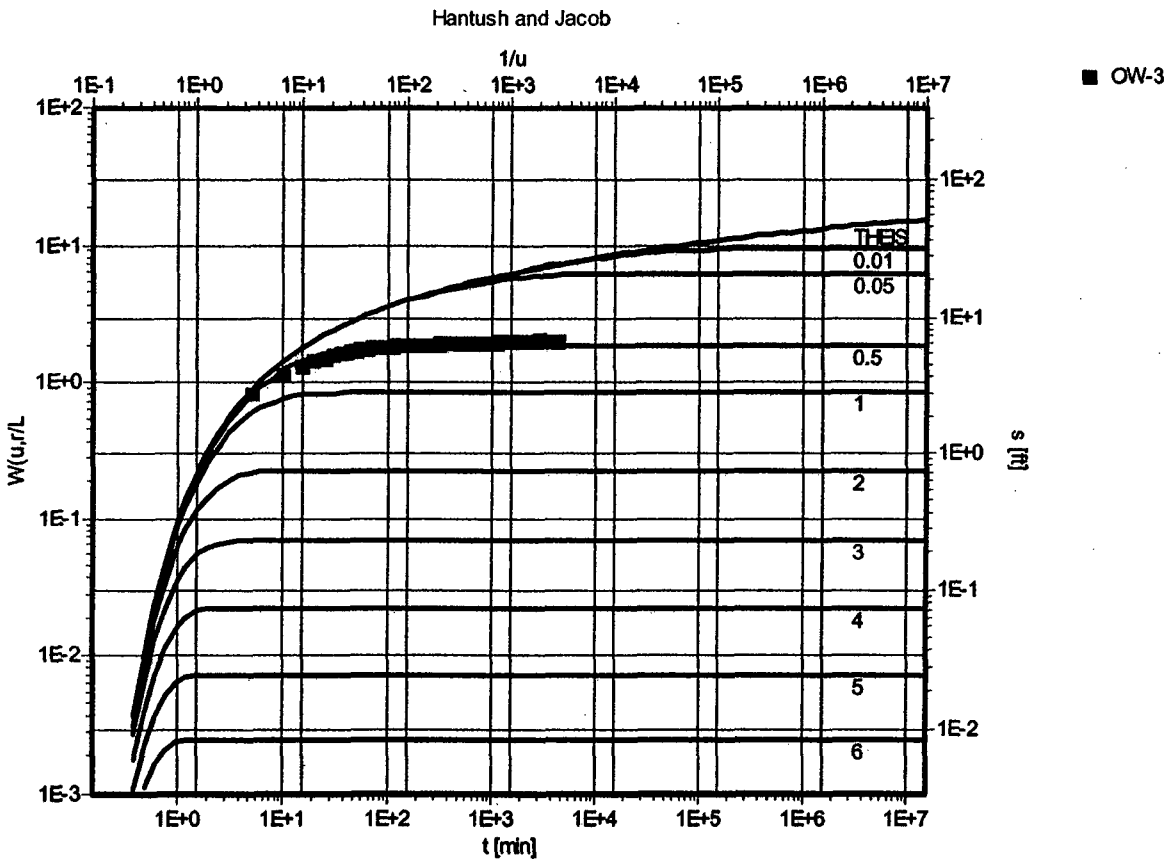
TW-4AD 72-Hour Constant-rate Pumping Test #1
72-Hour Distance-drawdown



GROUNDWATER SCIENCES CORPORATION 2601 Market Place Street, Suite 310 Harrisburg, PA 17110	**Pumping test analysis** **No:** *01003.10.0203* **Project:** *Shenandoah Road Alternative Water Supply* **Client:** *IBM*

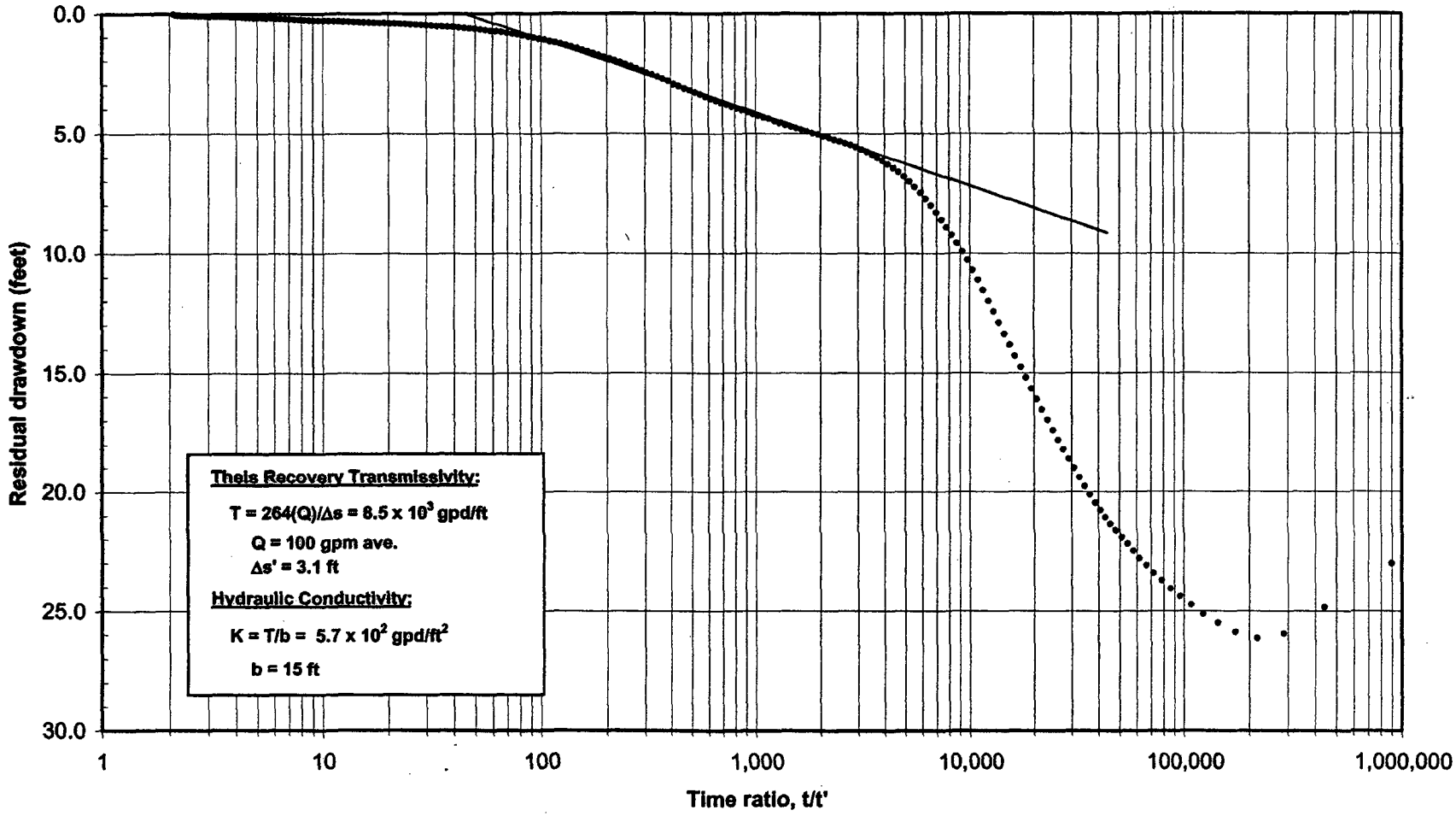
Location *Shenandoah Road, Fishkill, NY*	**Pumping test:** *TW-4AD 72-Hr*	**Pumping well:** *TW-4AD*

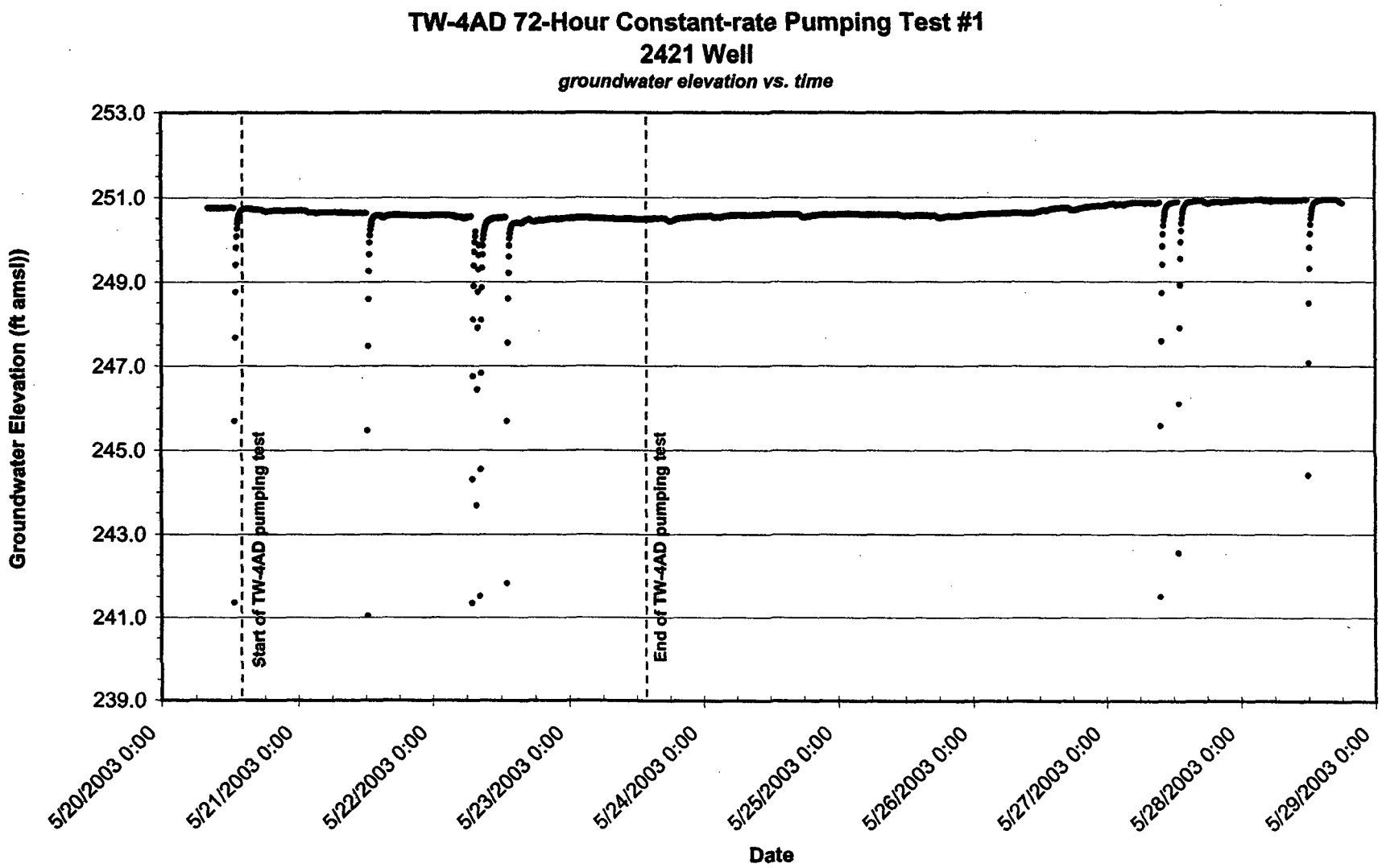
Test performed by:	**Evaluated by:**
Test date: *7/8/2003*	**Evaluation date:** *7/9/2003*
Analysis *Hantush and Jacob*	**Aquifer thickness:** *15 [ft]* **Discharge** *100 [U.S. gal/min]*

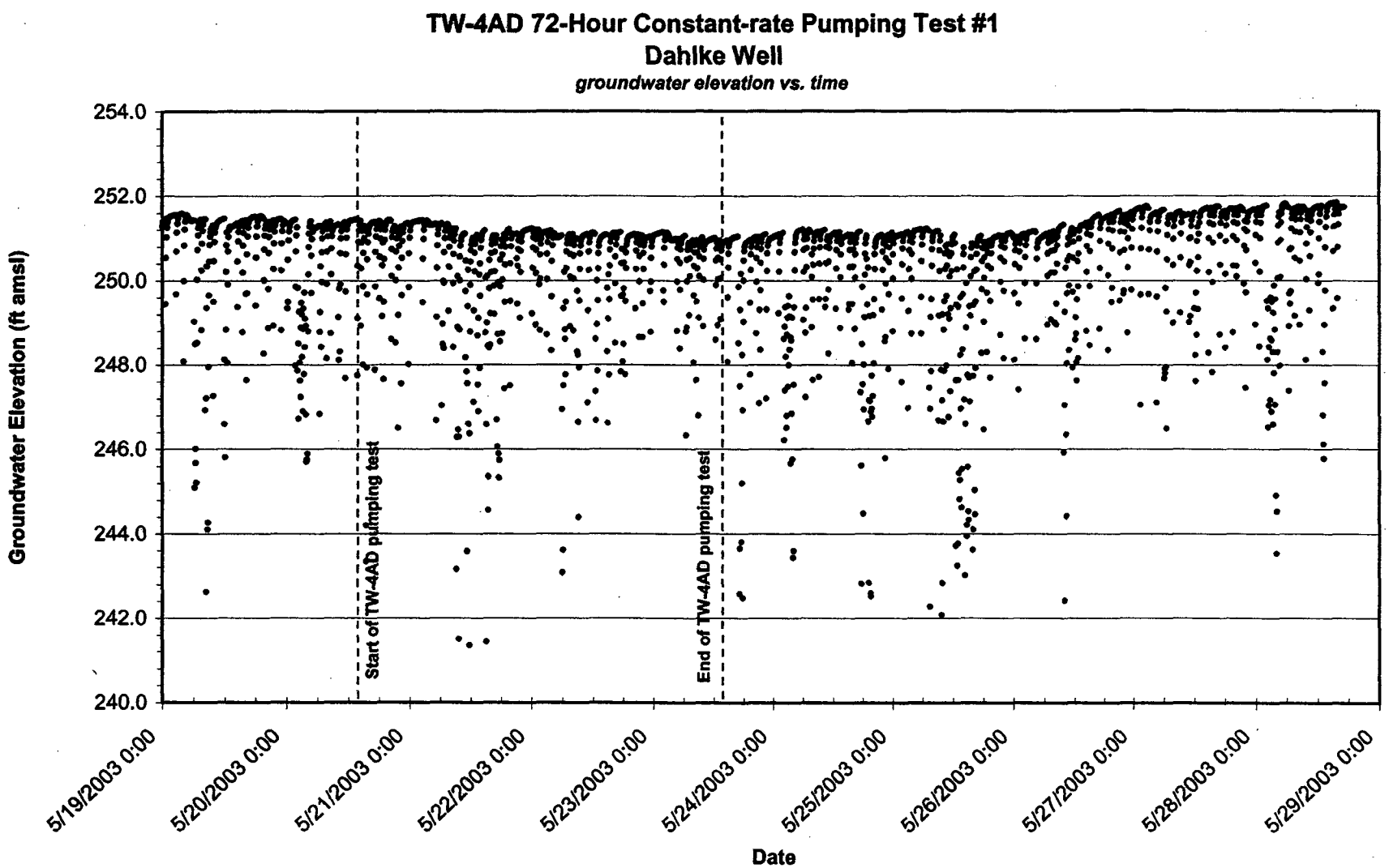


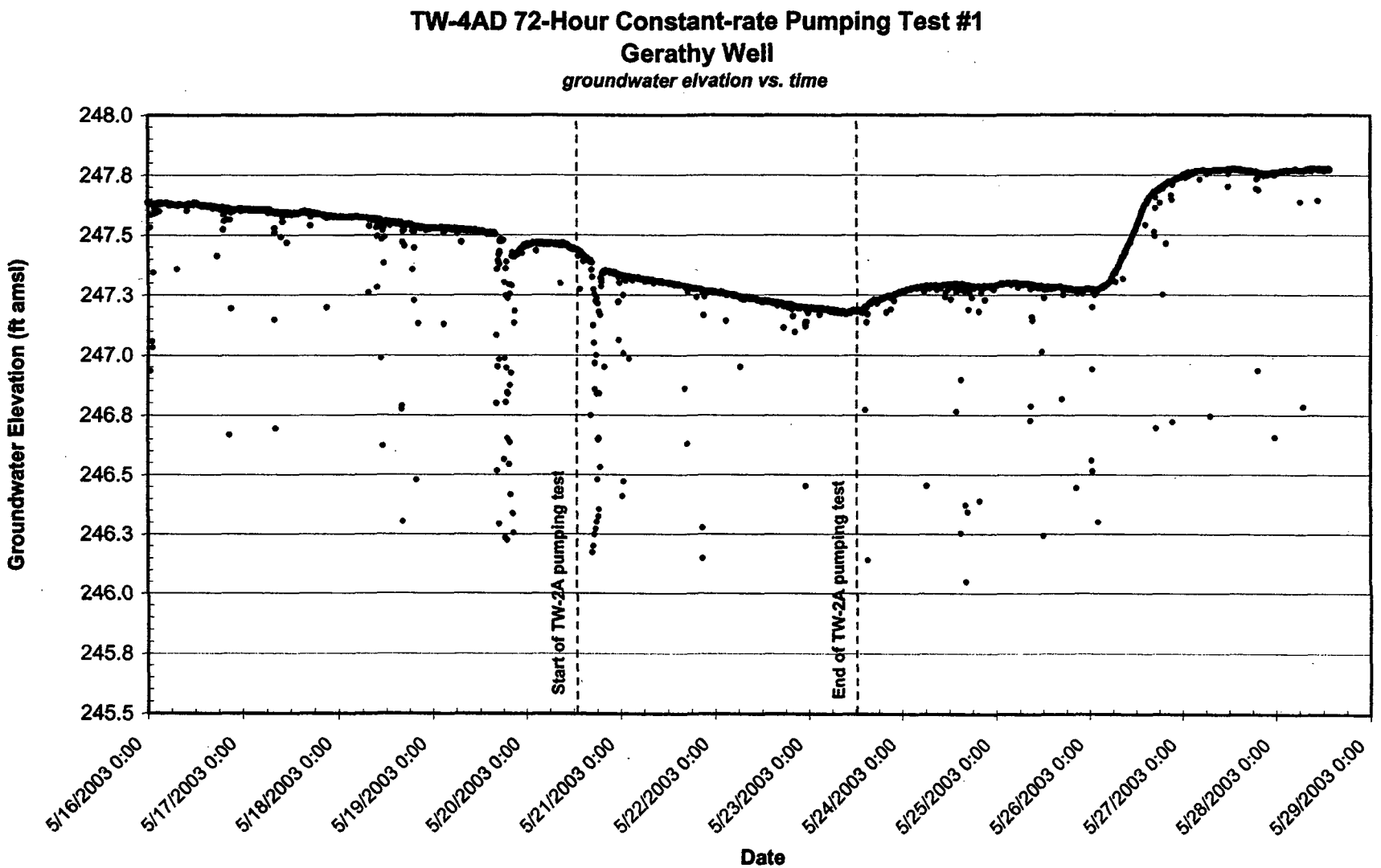
Transmissivity:	4.56×10^+2 [ft²/d]
Conductivity:	3.04×10^+1 [ft/d]
Storativity:	1.03×10^-3
c :	5.88×10^+7 [min]

TW-4AD 72-Hour Constant-rate Pumping Test #1
TW-4AD Recovery Analysis
time ratio vs. residual drawdown

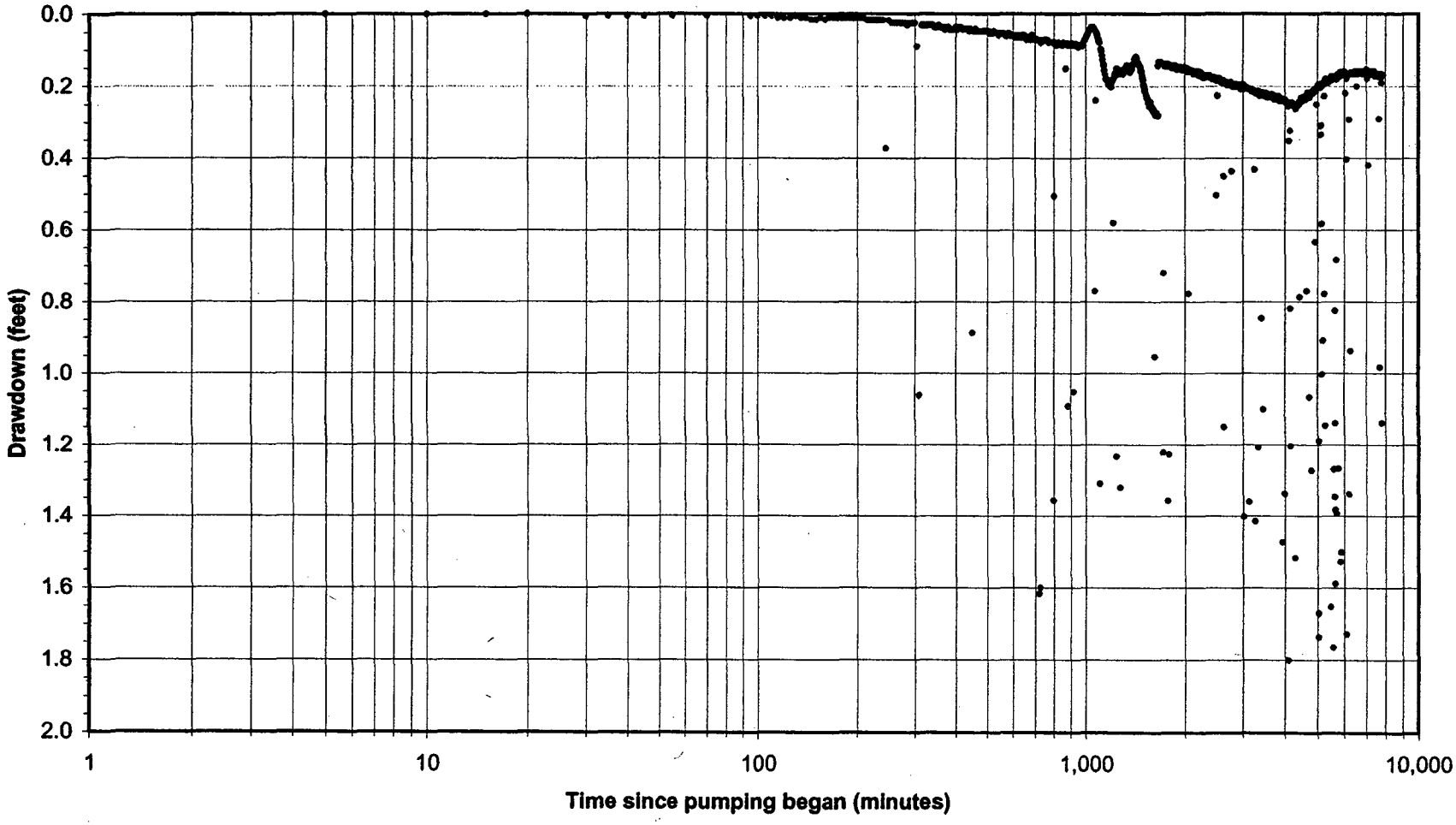


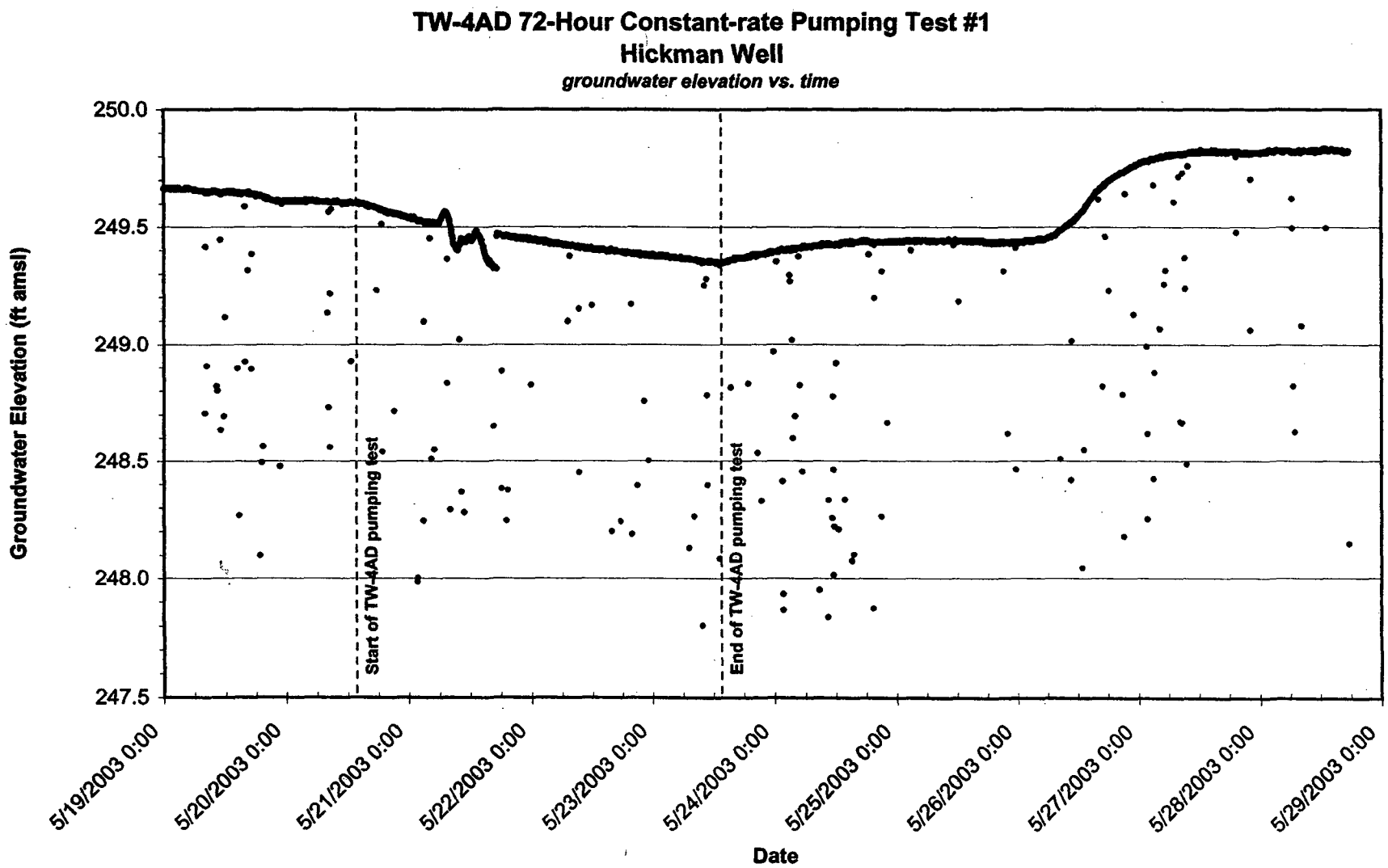

TW-4AD 72-Hour Constant-rate Pumping Test #1
2421 Well
groundwater elevation vs. time
Groundwater Elevation (ft amsl))
253.0
251.0
249.0
247.0
245.0
243.0
241.0
239.0
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

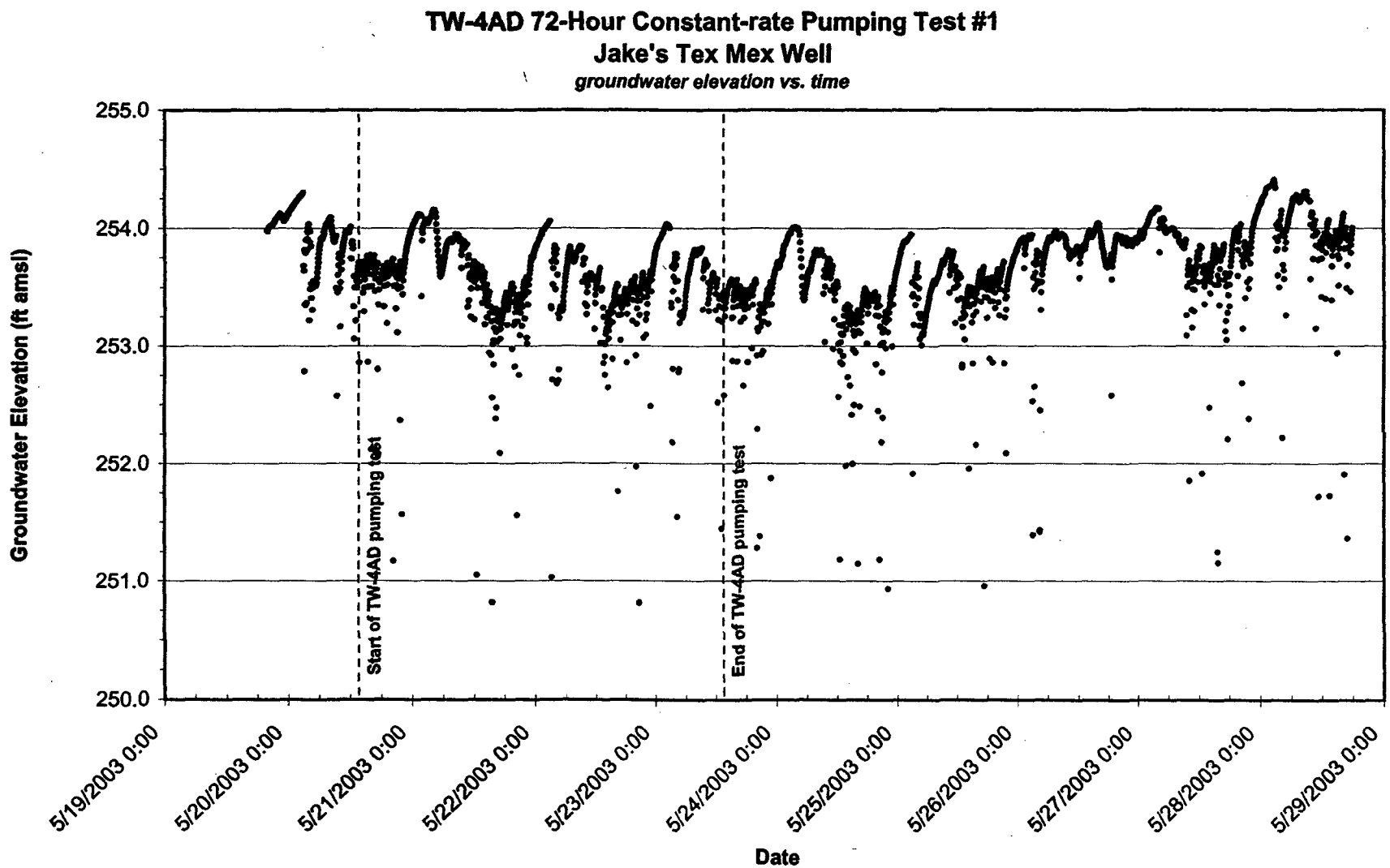

TW-4AD 72-Hour Constant-rate Pumping Test #1
Dahlke Well
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
254.0
252.0
250.0
248.0
246.0
244.0
242.0
240.0
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date


TW-4AD 72-Hour Constant-rate Pumping Test #1
Gerathy Well
groundwater elvation vs. time
Groundwater Elevation (ft amsl)
248.0
247.8
247.5
247.3
247.0
246.8
246.5
246.3
246.0
245.8
245.5
Start of TW-2A pumping test
End of TW-2A pumping test
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

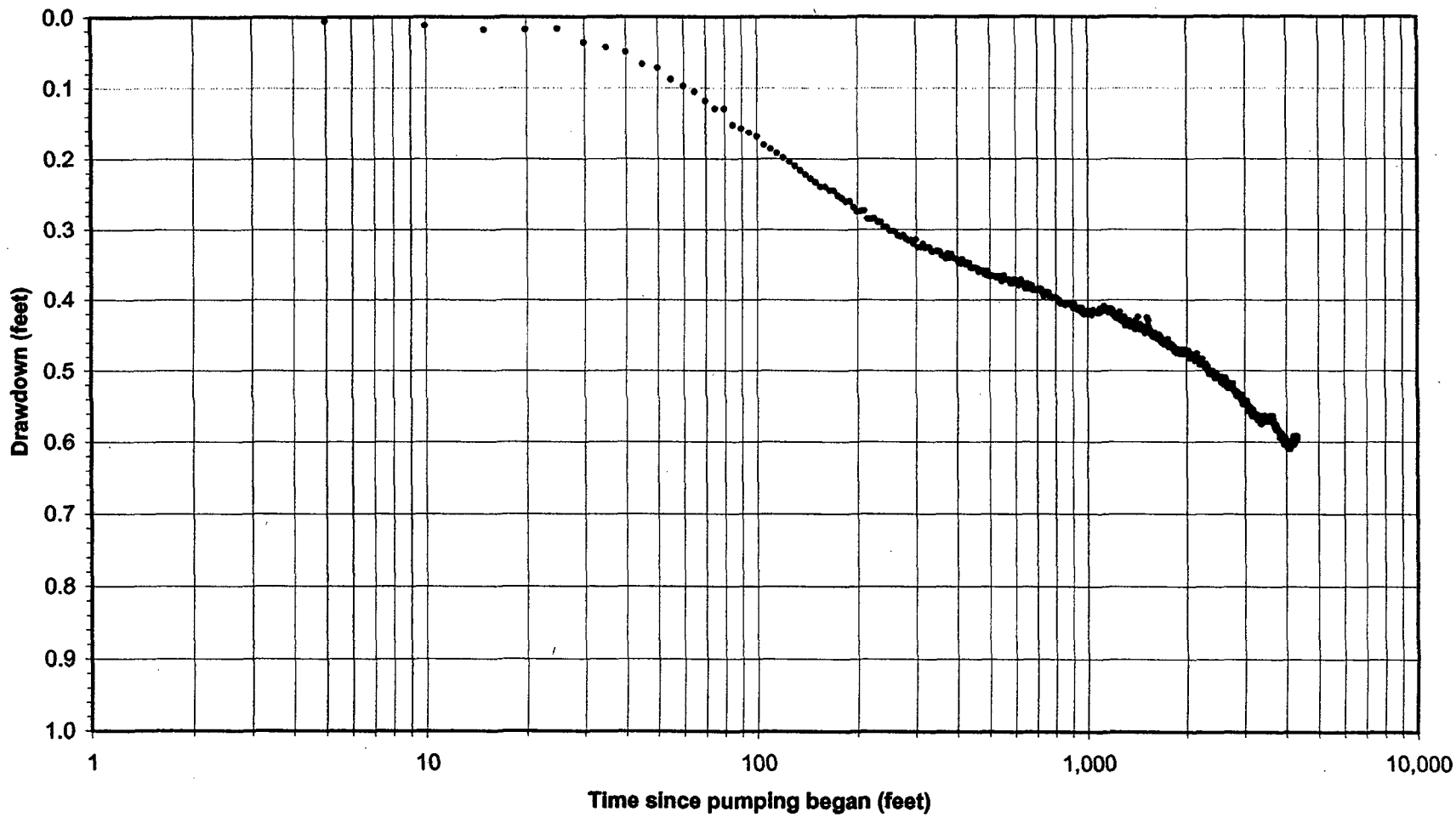
TW-4AD 72-Hour Constant-rate Pumping Test #1
Hickman Well
time vs. drawdown

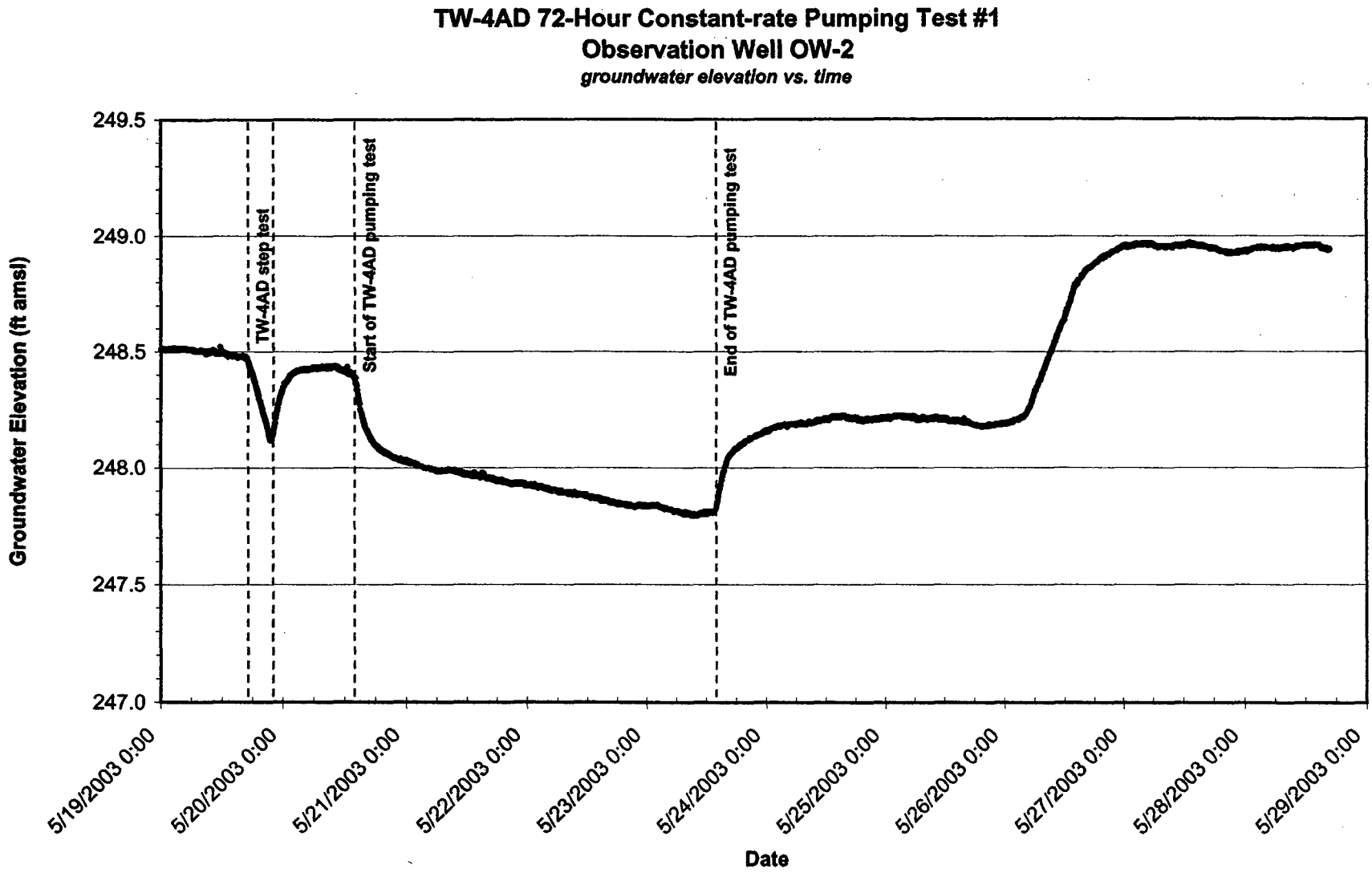


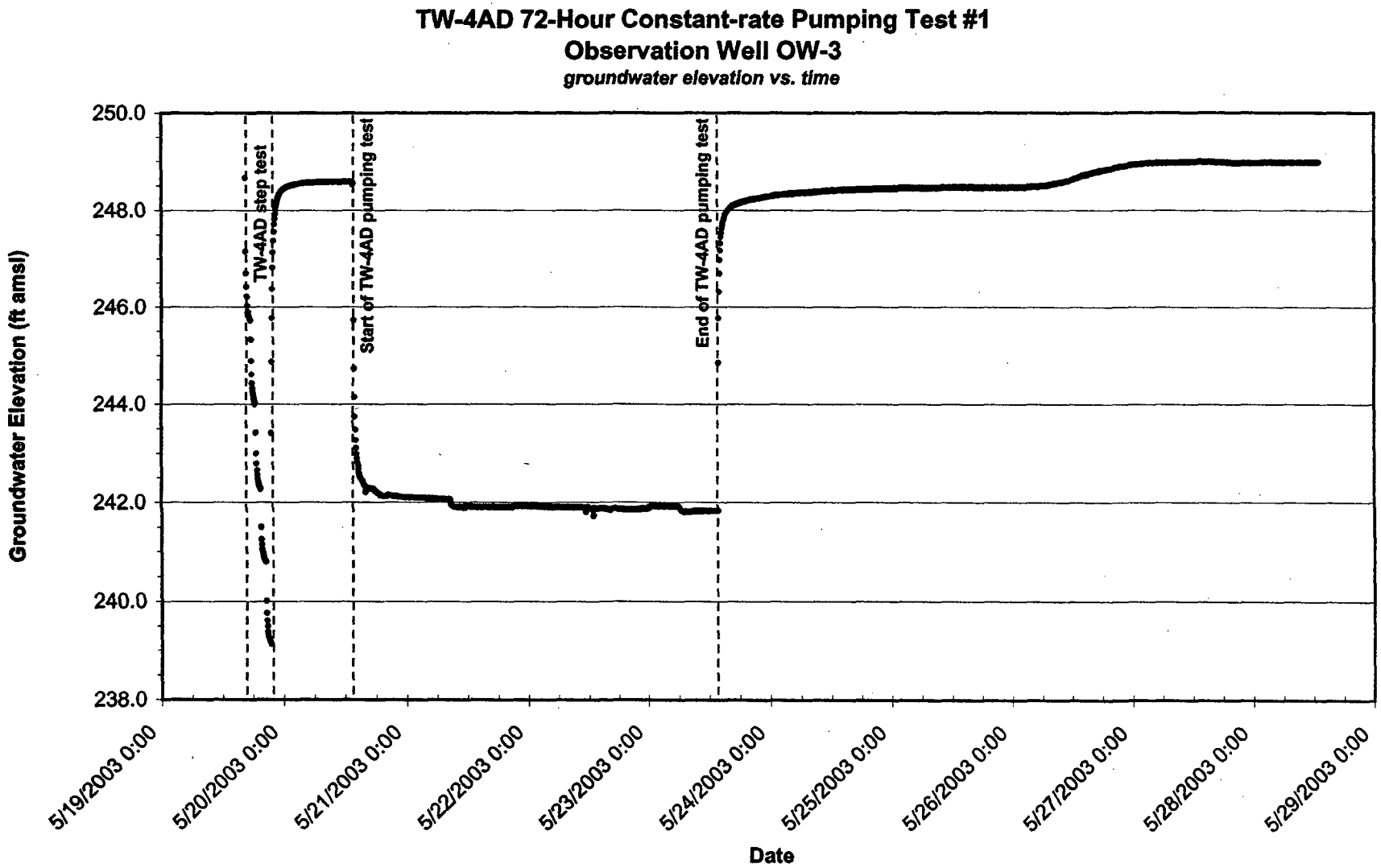

TW-4AD 72-Hour Constant-rate Pumping Test #1
Hickman Well
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
250.0
249.5
249.0
248.5
248.0
247.5
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

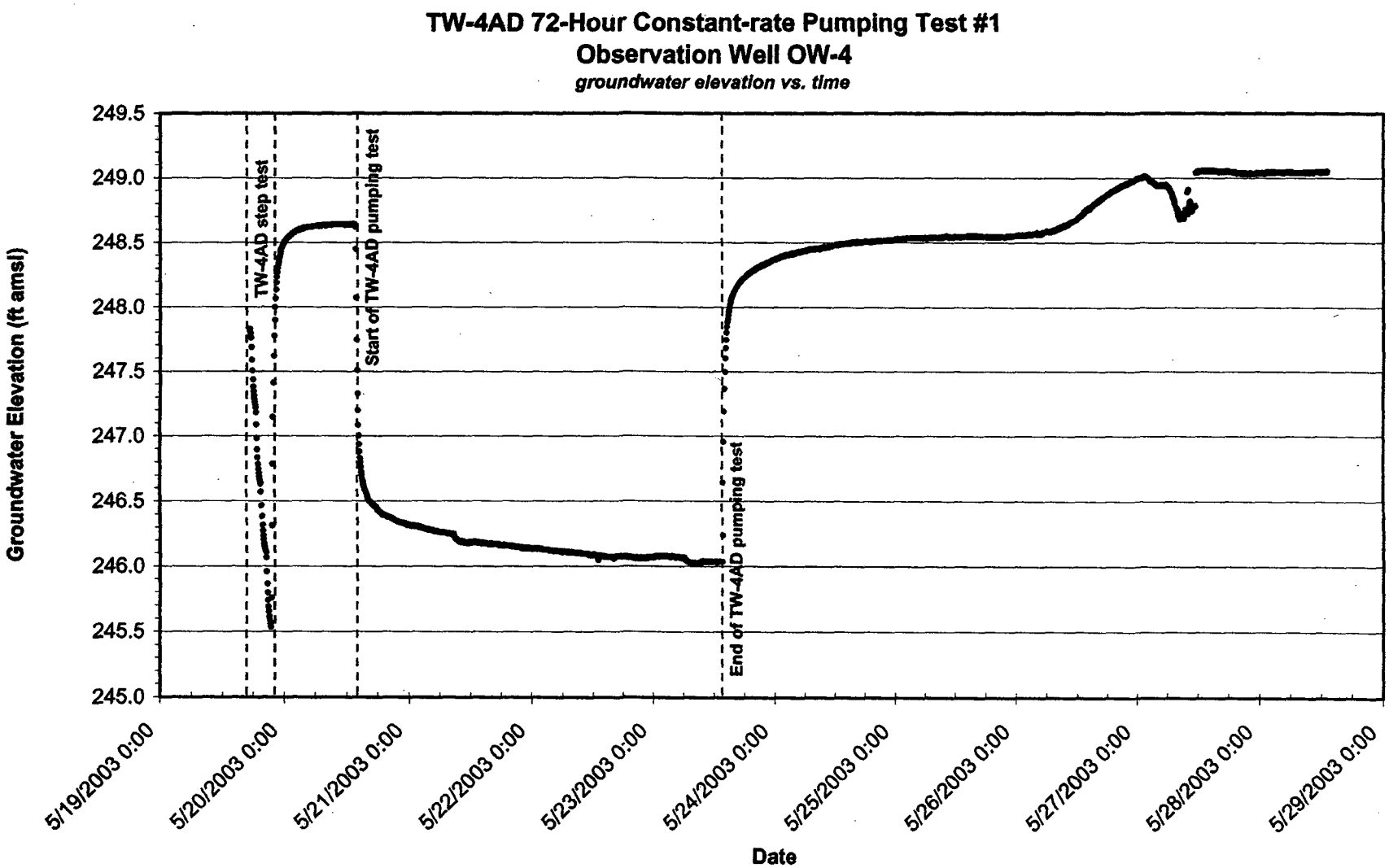

TW-4AD 72-Hour Constant-rate Pumping Test #1
Jake's Tex Mex Well
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
255.0
254.0
253.0
252.0
251.0
250.0
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

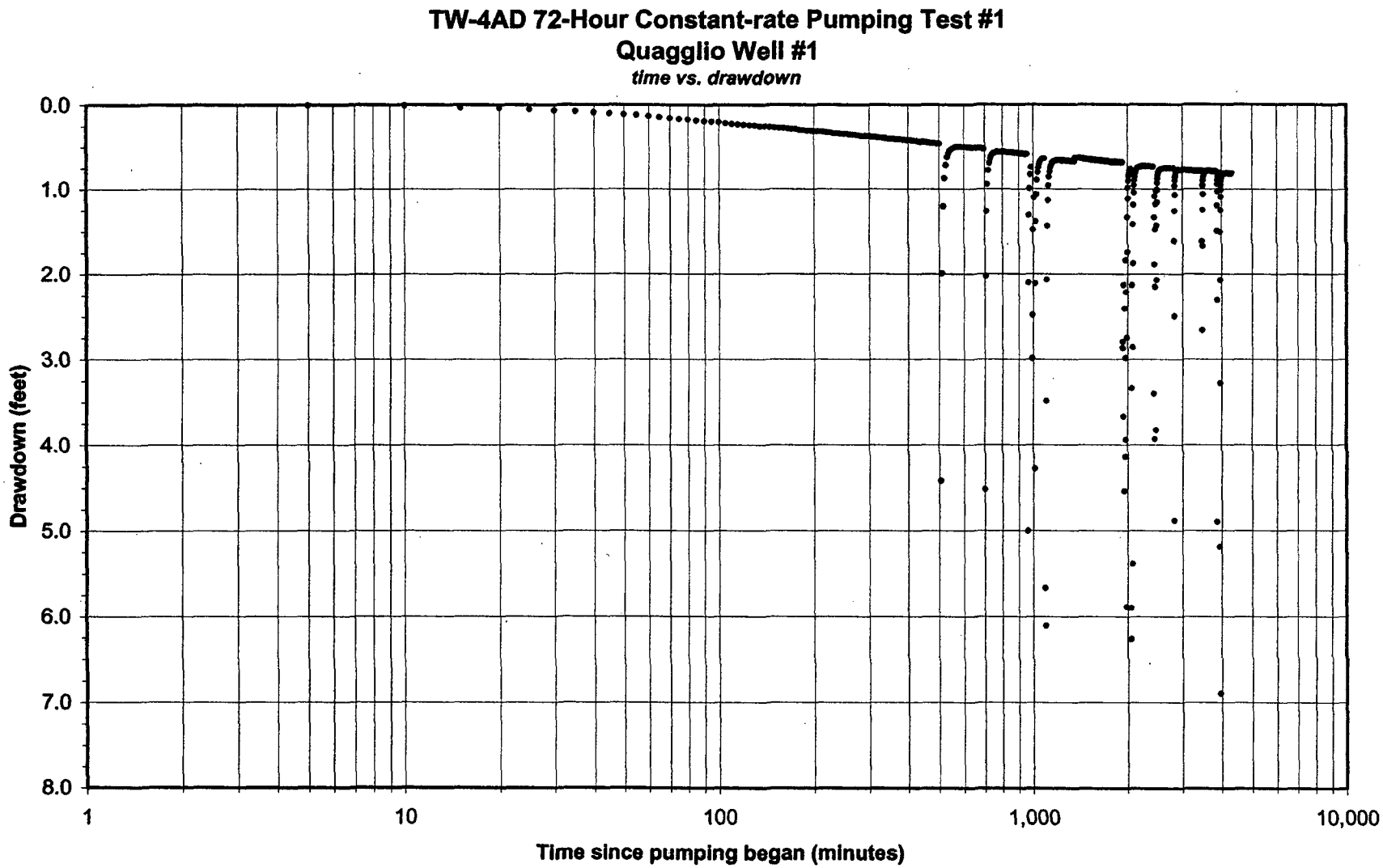
TW-4AD 72-Hour Constant-rate Pumping Test #1
Observation Well OW-2
time vs. drawdown

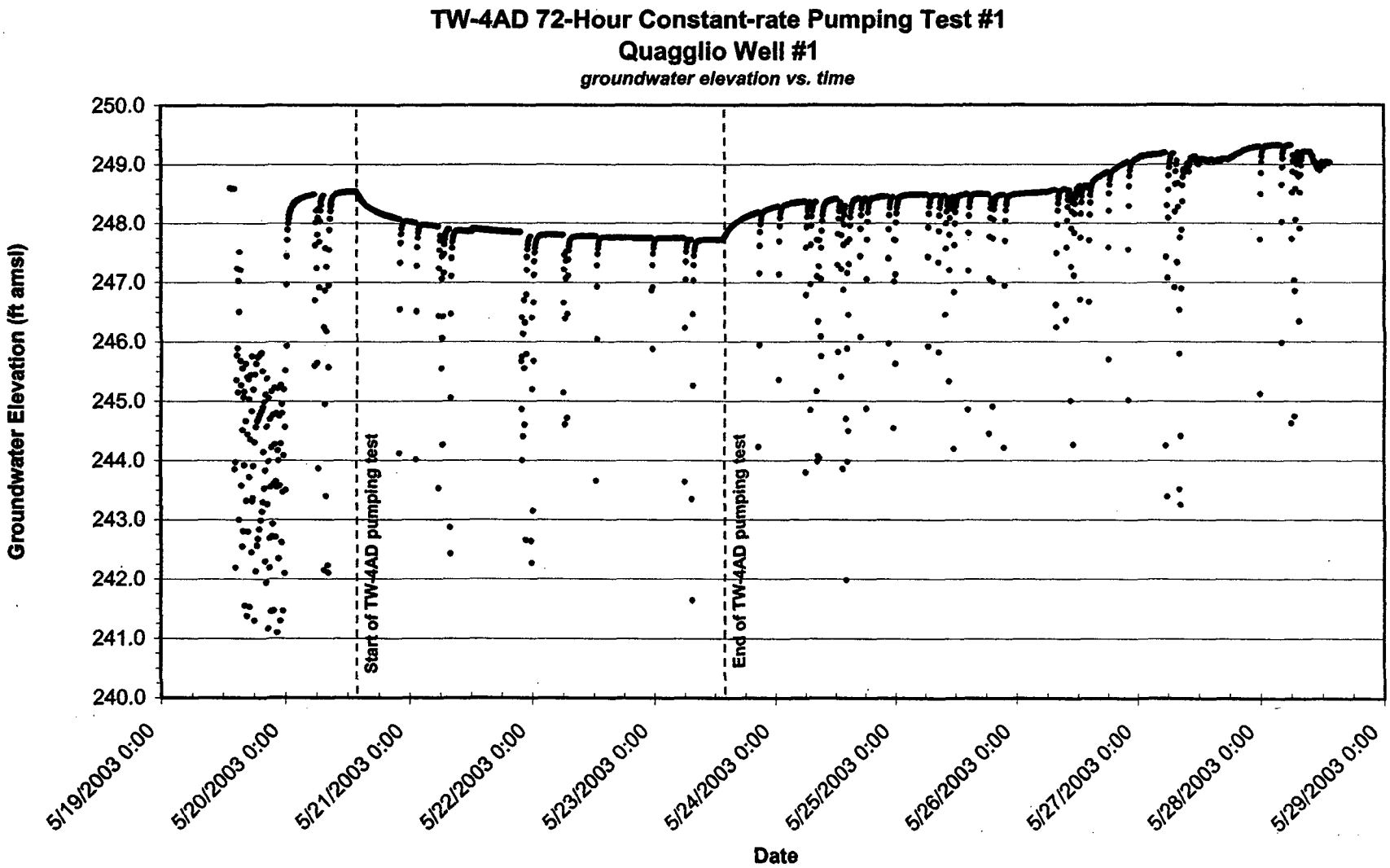


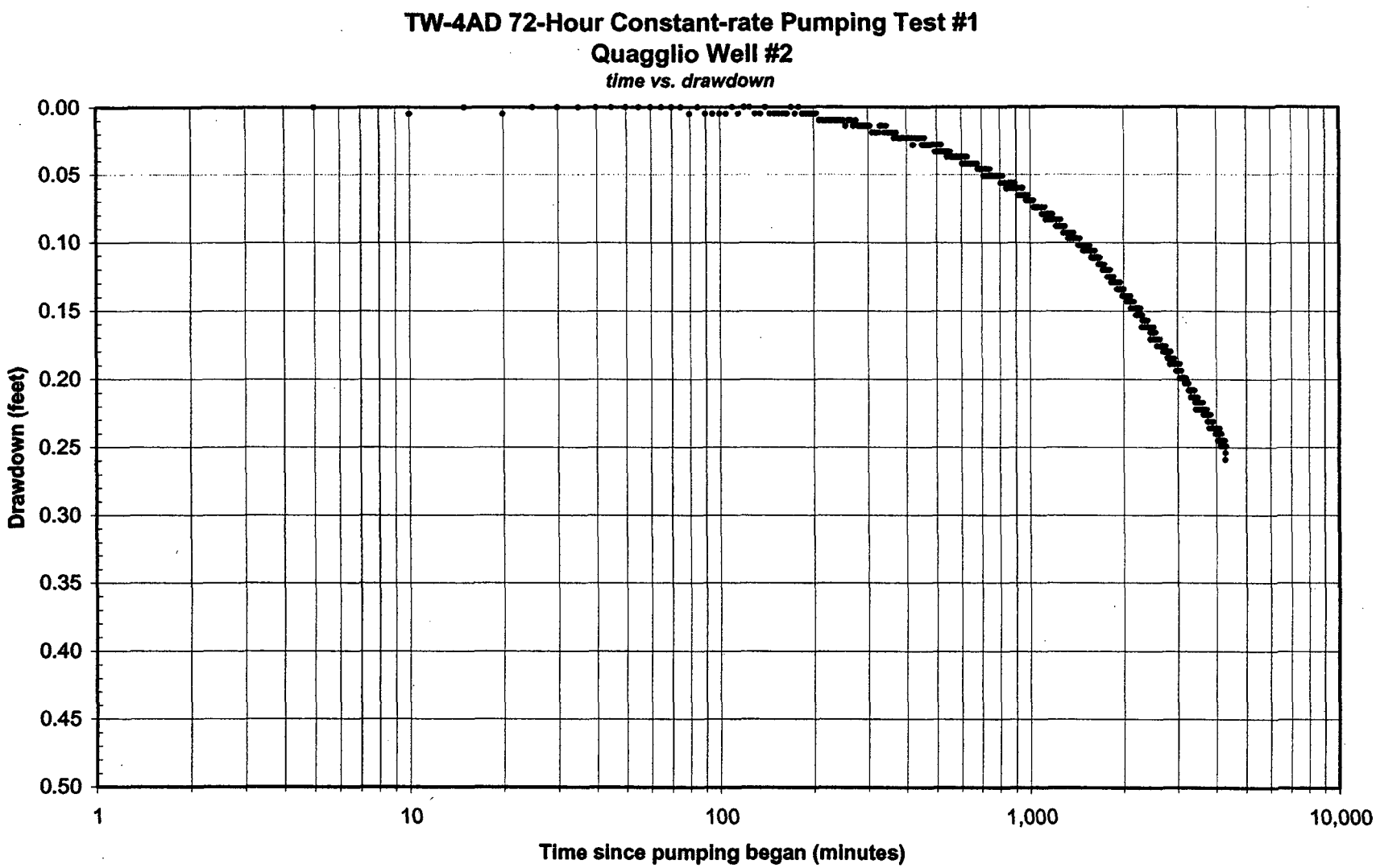

TW-4AD 72-Hour Constant-rate Pumping Test #1
Observation Well OW-2
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
249.5
249.0
248.5
248.0
247.5
247.0
TW-4AD step test
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

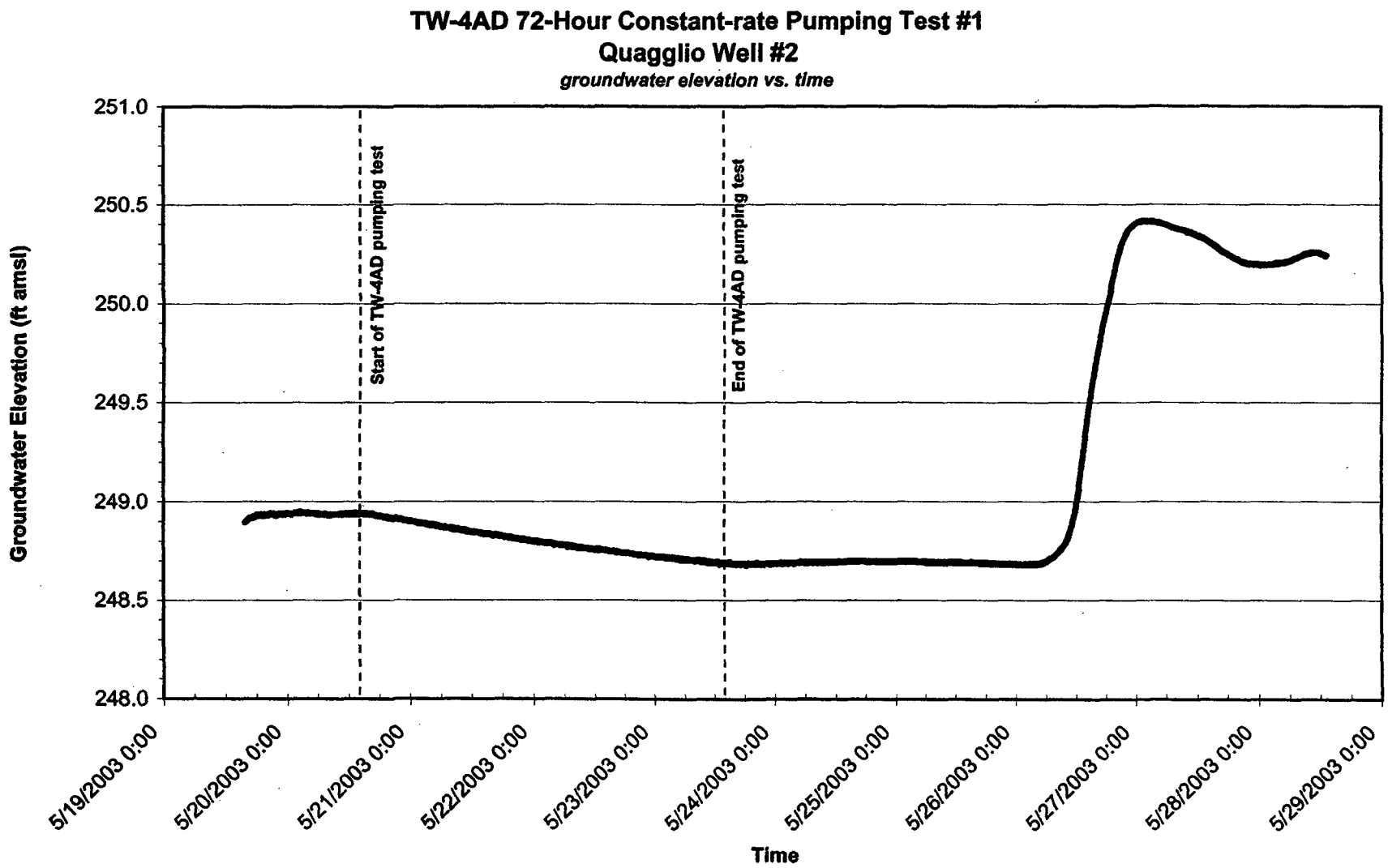

TW-4AD 72-Hour Constant-rate Pumping Test #1
Observation Well OW-3
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
250.0
248.0
246.0
244.0
242.0
240.0
238.0
TW-4AD step test
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

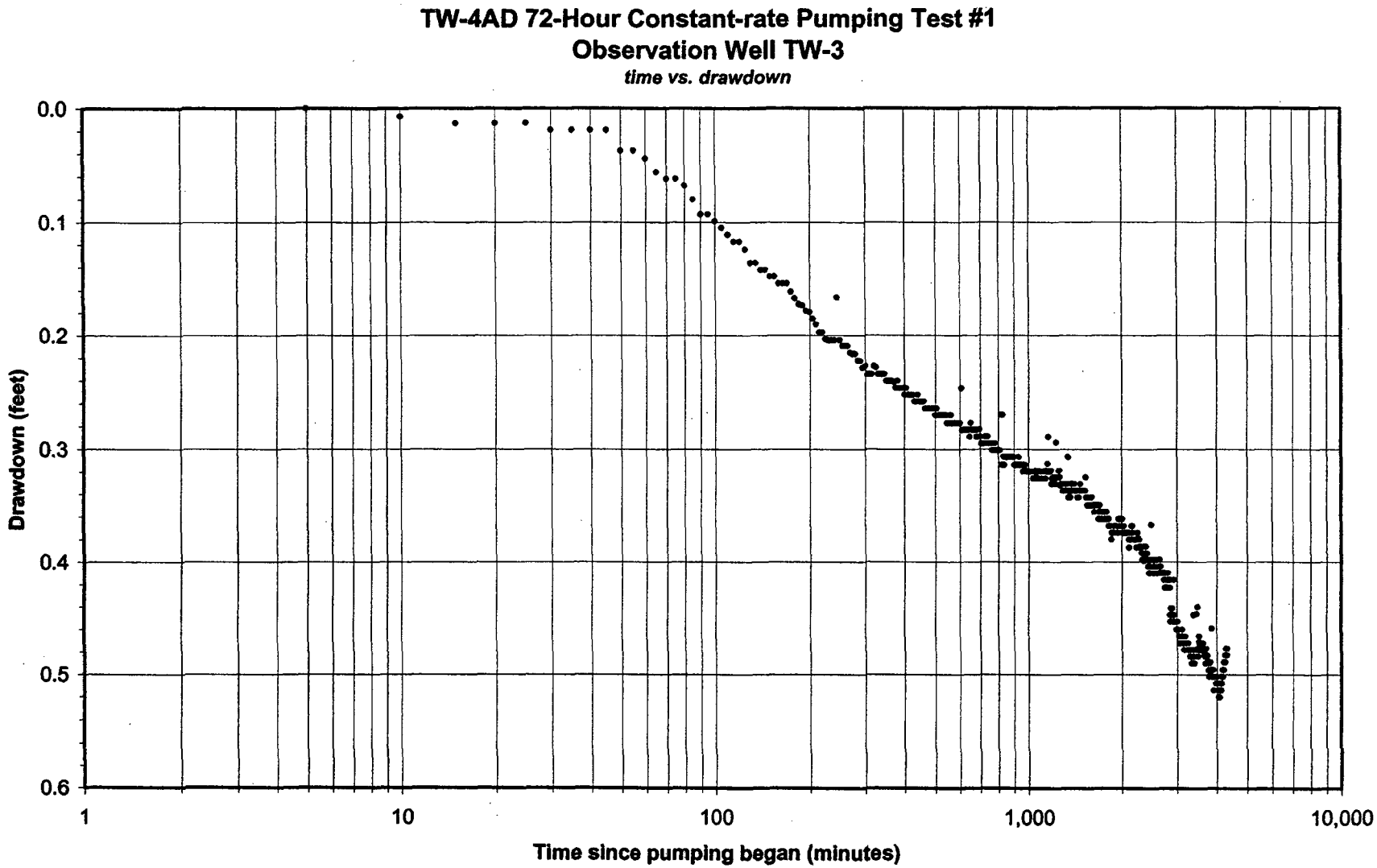

TW-4AD 72-Hour Constant-rate Pumping Test #1
Observation Well OW-4
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
249.5
249.0
248.5
248.0
247.5
247.0
246.5
246.0
245.5
245.0
TW-4AD step test
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

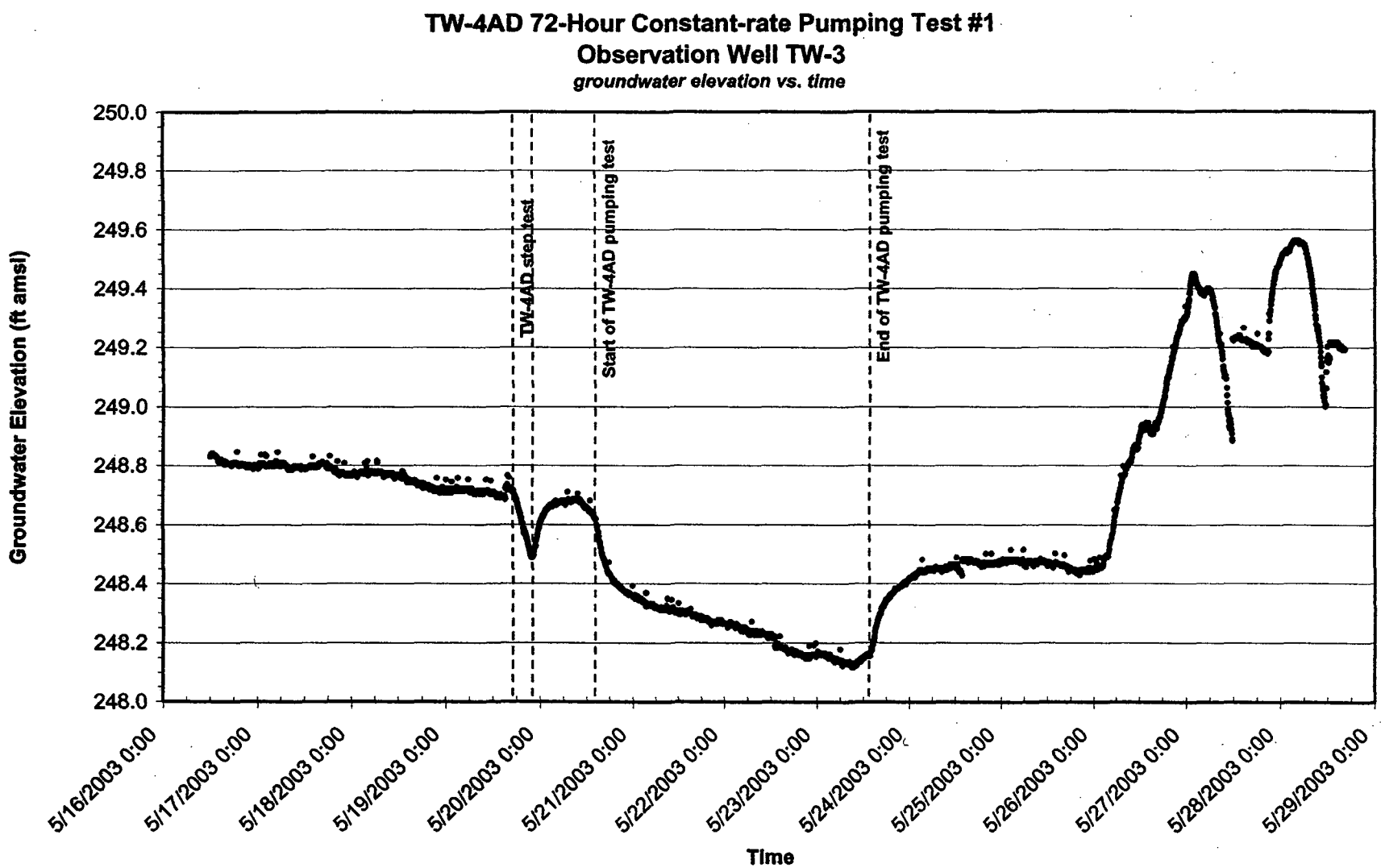

TW-4AD 72-Hour Constant-rate Pumping Test #1
Quagglio Well #1
time vs. drawdown
Drawdown (feet)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
1
10
100
1,000
10,000
Time since pumping began (minutes)


TW-4AD 72-Hour Constant-rate Pumping Test #1
Quagglio Well #1
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
250.0
249.0
248.0
247.0
246.0
245.0
244.0
243.0
242.0
241.0
240.0
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date


TW-4AD 72-Hour Constant-rate Pumping Test #1
Quagglio Well #2
time vs. drawdown
Drawdown (feet)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
0.50
1
10
100
1,000
10,000
Time since pumping began (minutes)


TW-4AD 72-Hour Constant-rate Pumping Test #1
Quagglio Well #2
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
251.0
250.5
250.0
249.5
249.0
248.5
248.0
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Time


TW-4AD 72-Hour Constant-rate Pumping Test #1
Observation Well TW-3
time vs. drawdown
Drawdown (feet)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
1
10
100
1,000
10,000
Time since pumping began (minutes)


TW-4AD 72-Hour Constant-rate Pumping Test #1
Observation Well TW-3
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
250.0
249.8
249.6
249.4
249.2
249.0
248.8
248.6
248.4
248.2
248.0
TW-4AD step test
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
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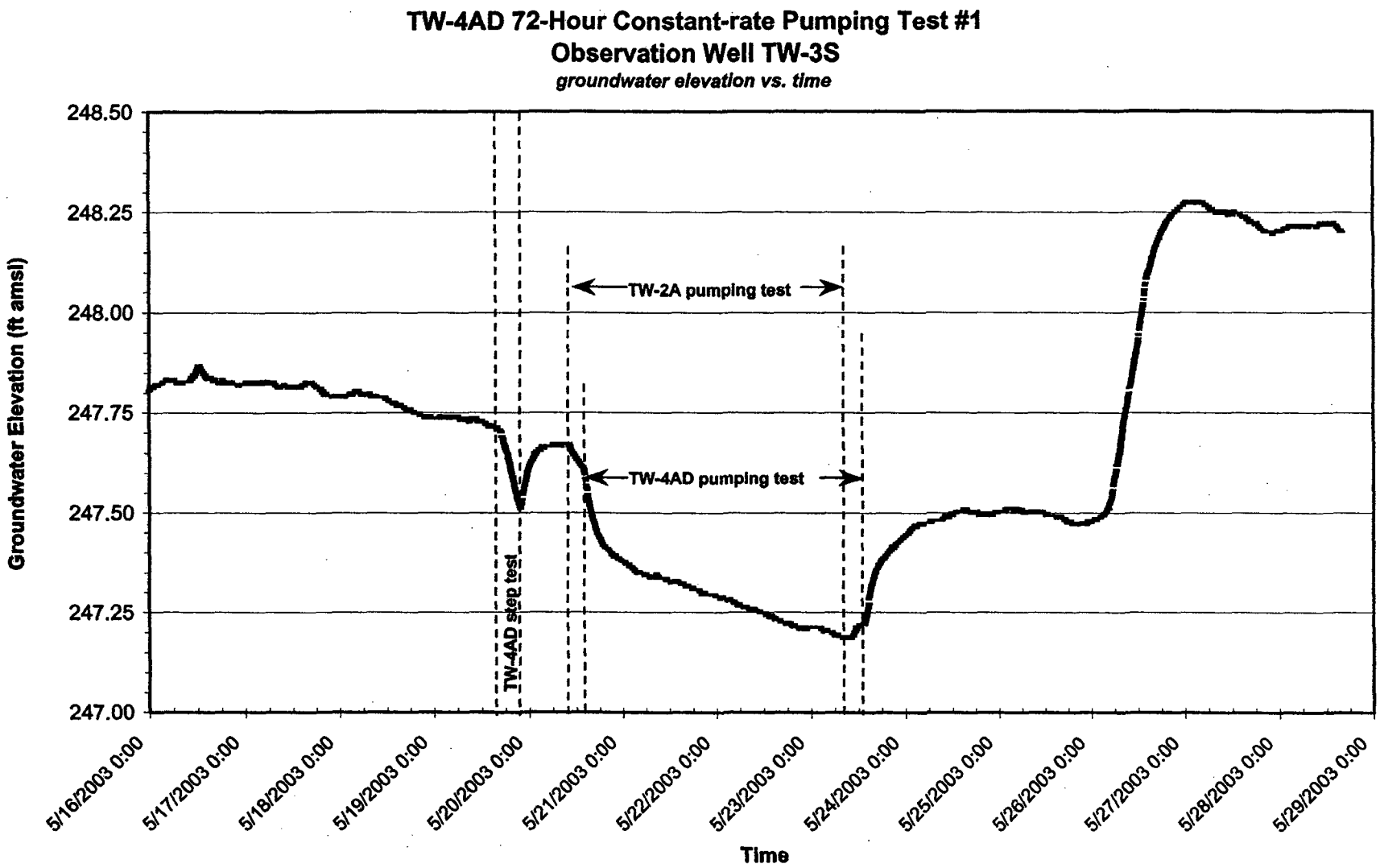
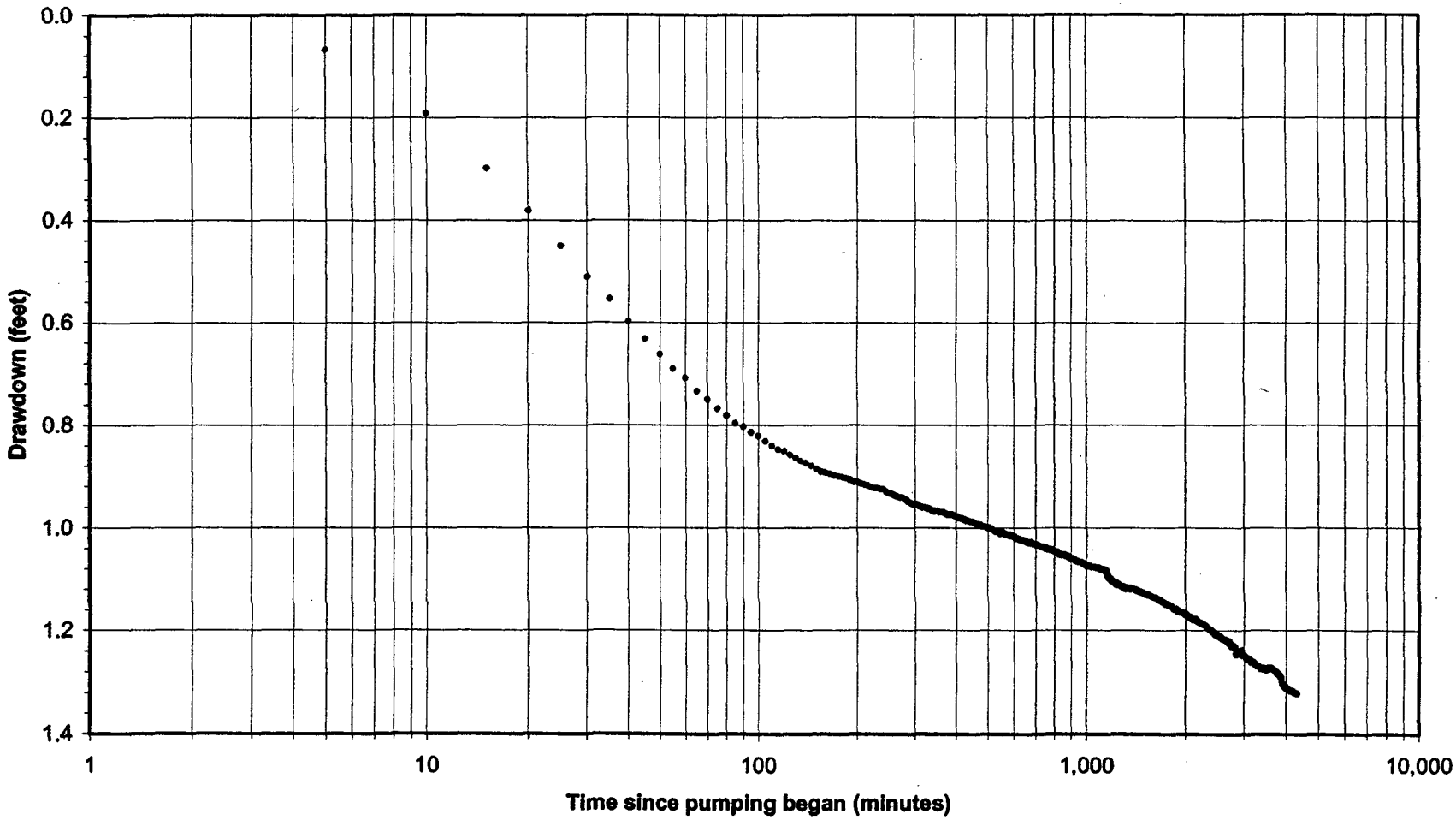
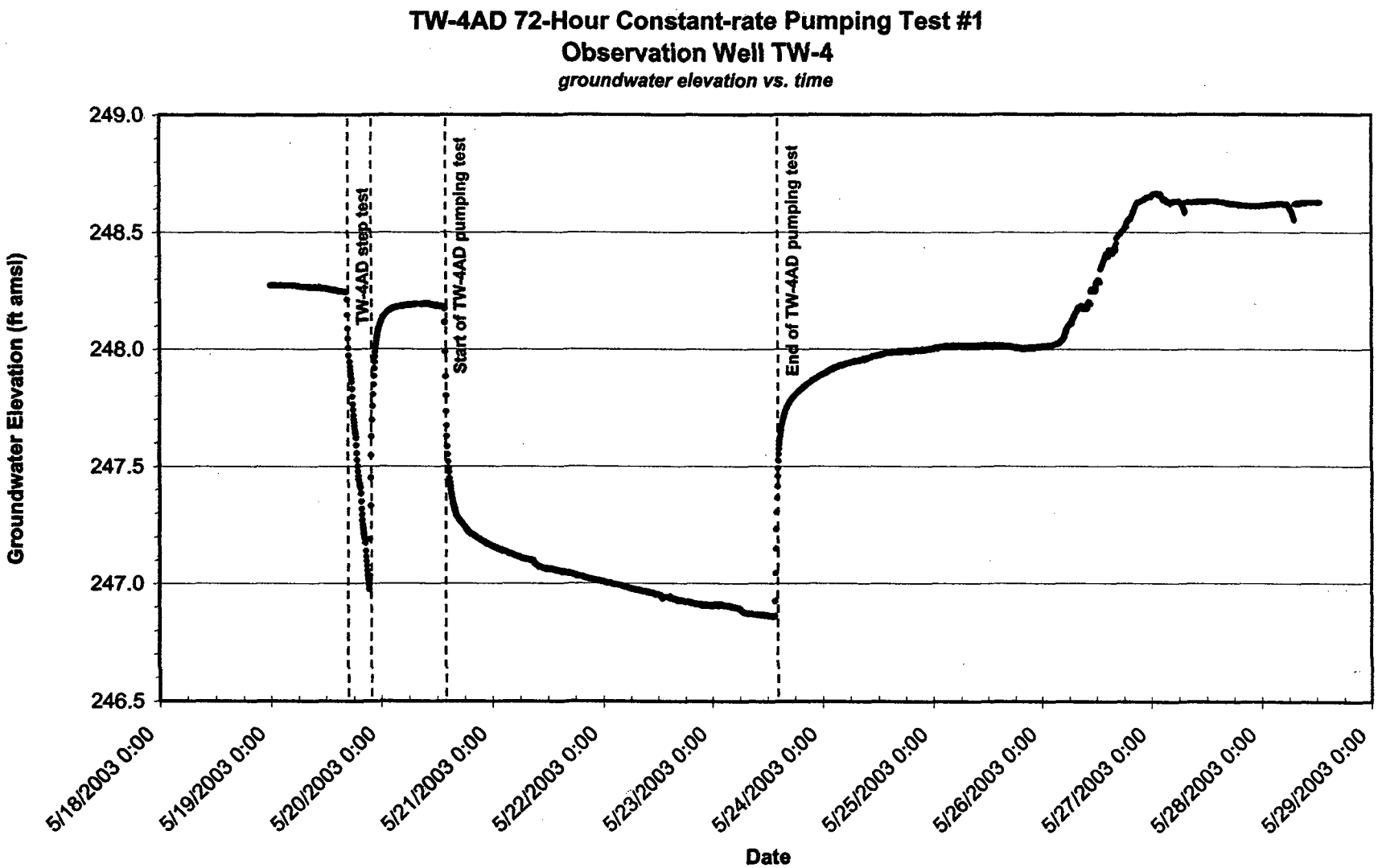
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Time

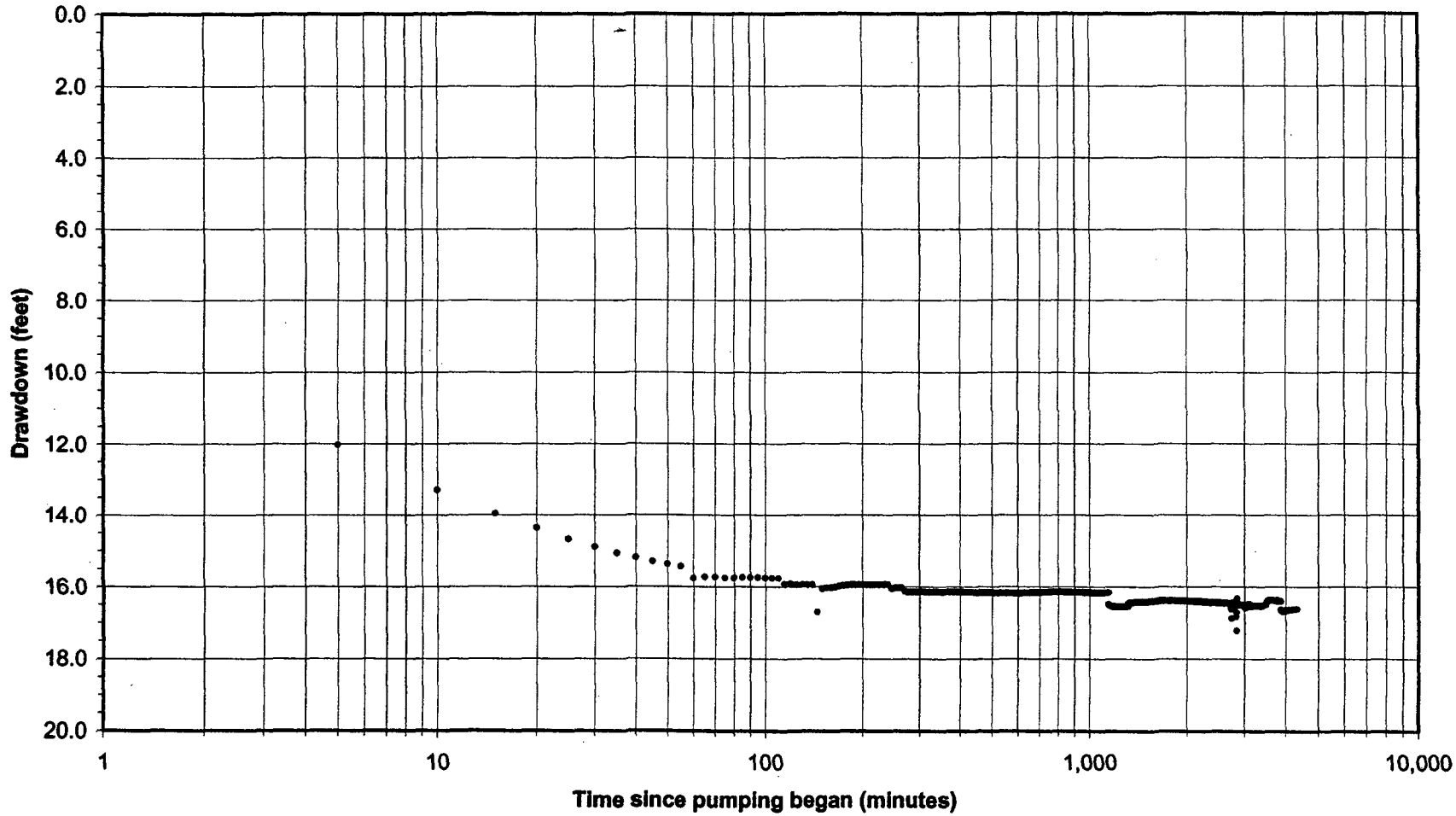

TW-4AD 72-Hour Constant-rate Pumping Test #1
Observation Well TW-3S
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
248.50
248.25
248.00
247.75
247.50
247.25
247.00
TW-2A pumping test
TW-4AD pumping test
TW-4AD step test
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Time

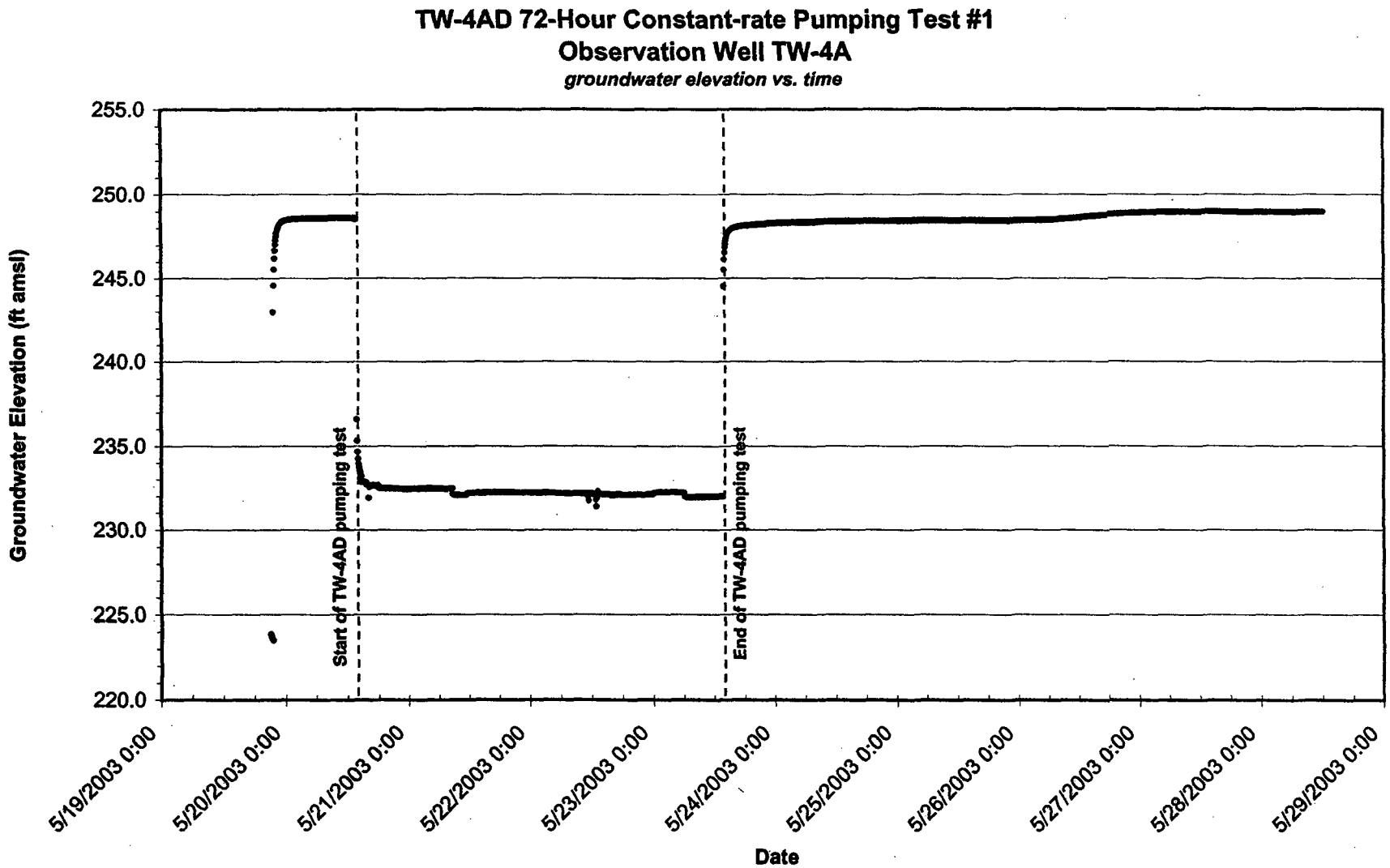
TW-4AD 72-Hour Constant-rate Pumping Test #1
Observation Well TW-4
time vs. drawdown

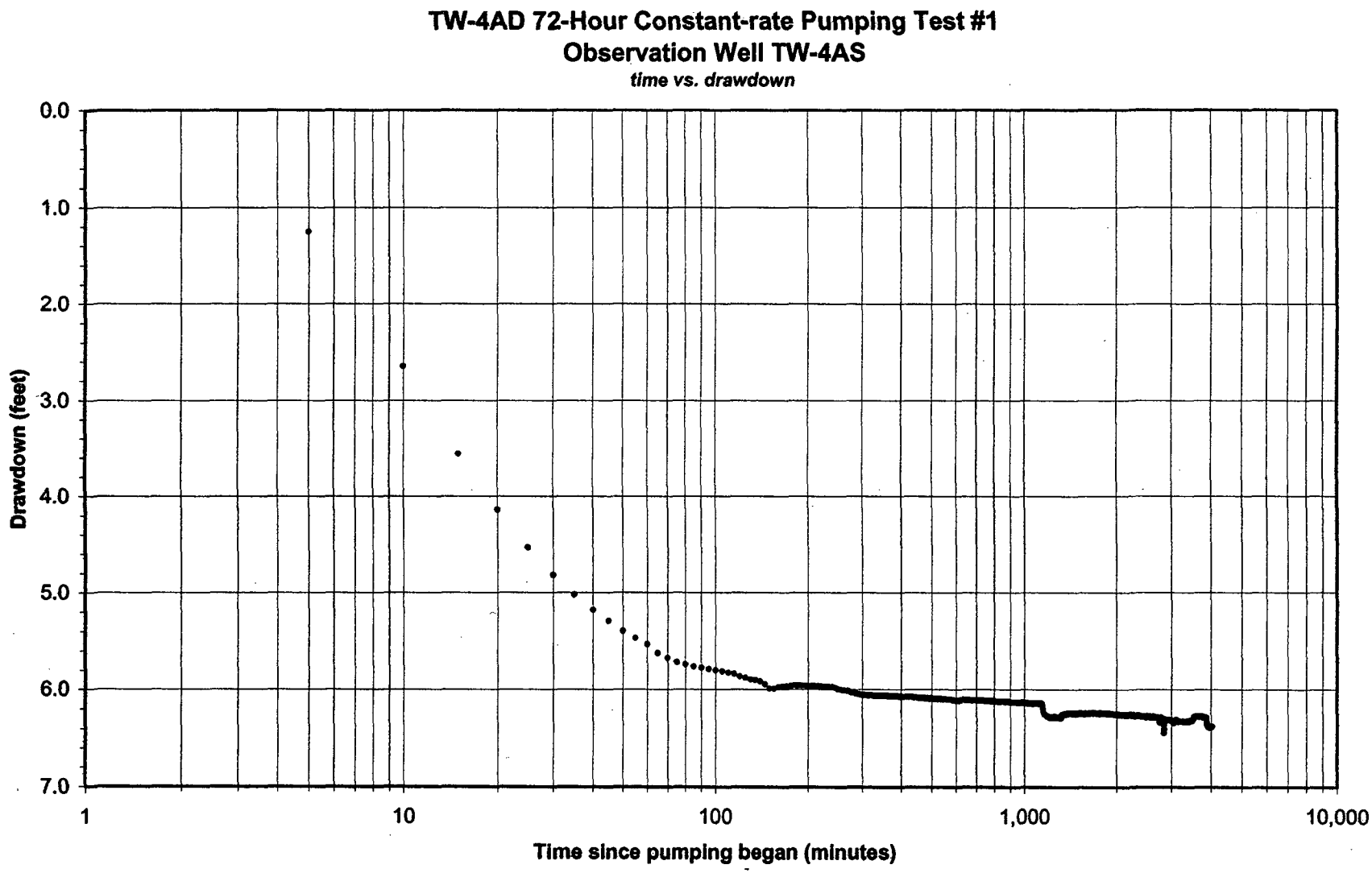


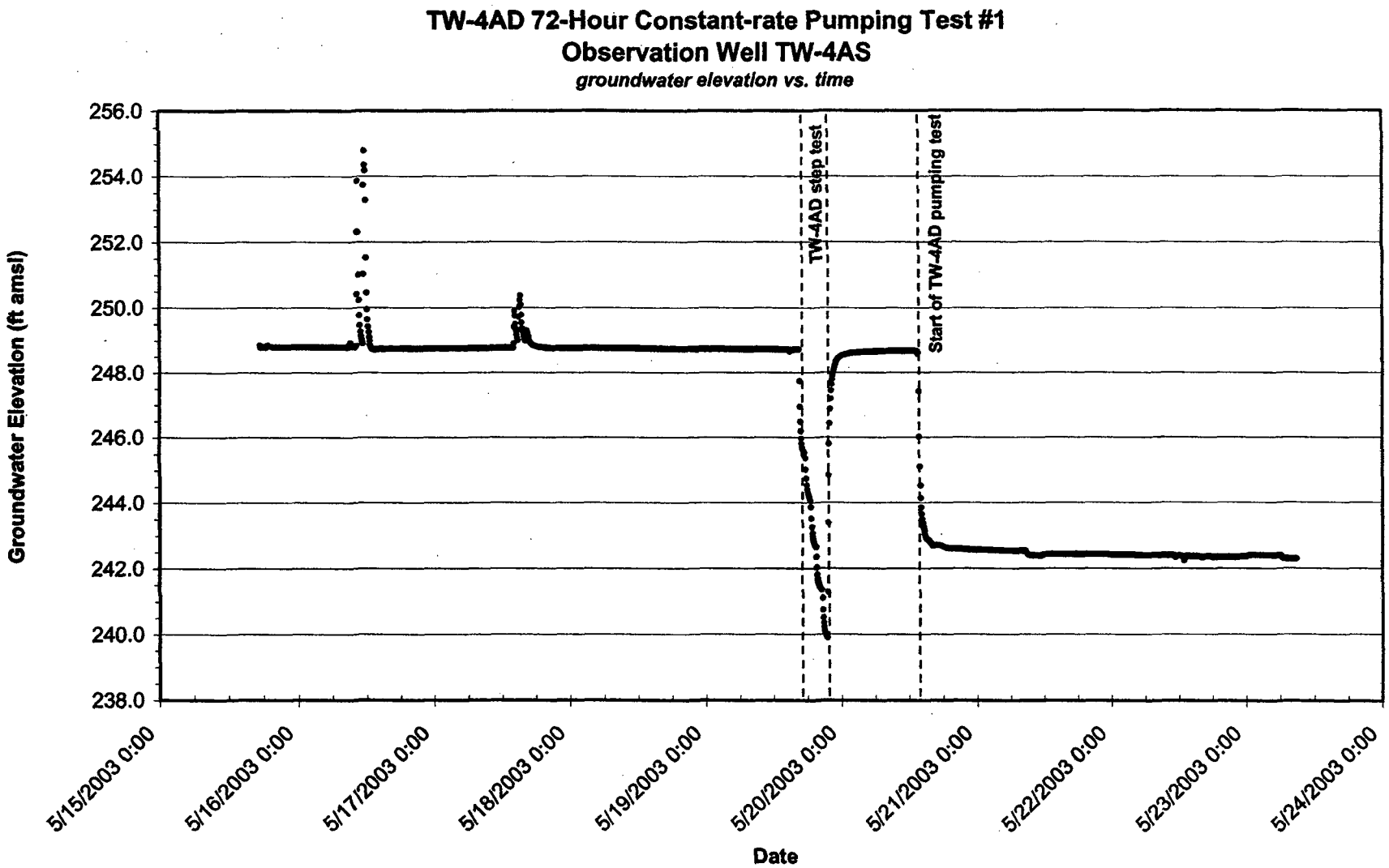

TW-4AD 72-Hour Constant-rate Pumping Test #1
Observation Well TW-4
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
249.0
248.5
248.0
247.5
247.0
246.5
TW-4AD step test
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

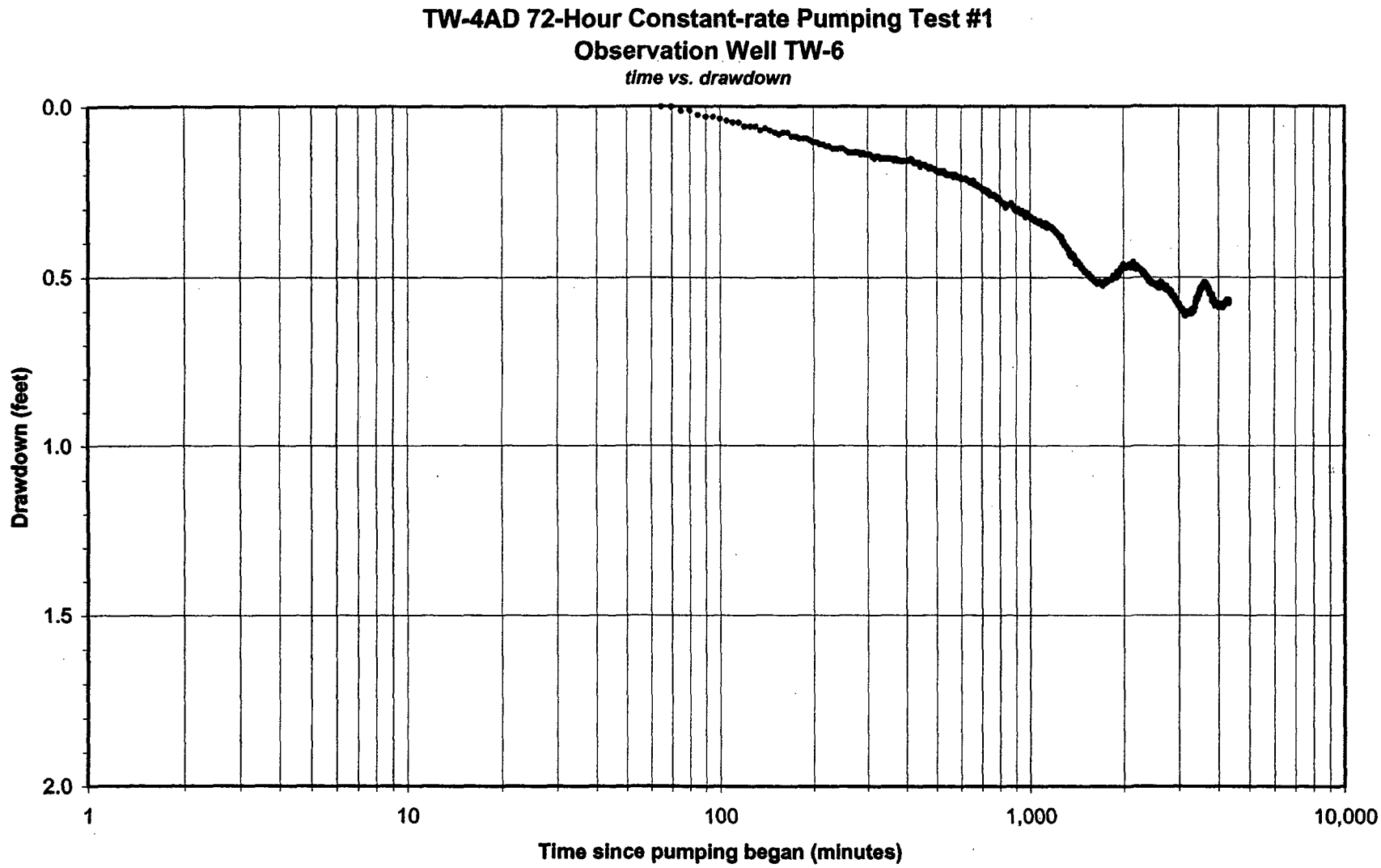
TW-4AD 72-Hour Constant-rate Pumping Test #1
Observation Well TW-4A
time vs. drawdown

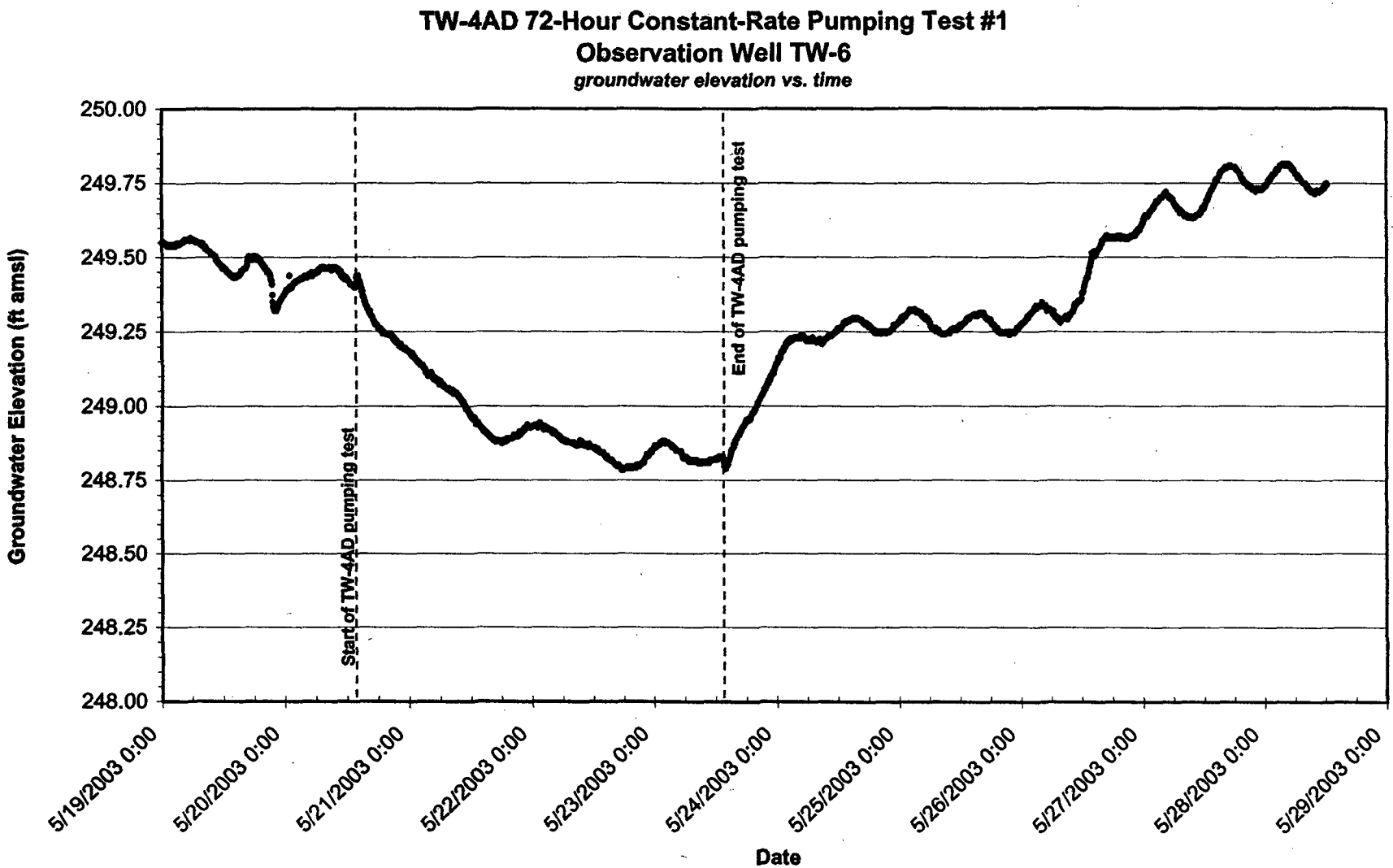



TW-4AD 72-Hour Constant-rate Pumping Test #1
Observation Well TW-4A
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
255.0
250.0
245.0
240.0
235.0
230.0
225.0
220.0
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date


TW-4AD 72-Hour Constant-rate Pumping Test #1
Observation Well TW-4AS
time vs. drawdown
Drawdown (feet)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
1
10
100
1,000
10,000
Time since pumping began (minutes)

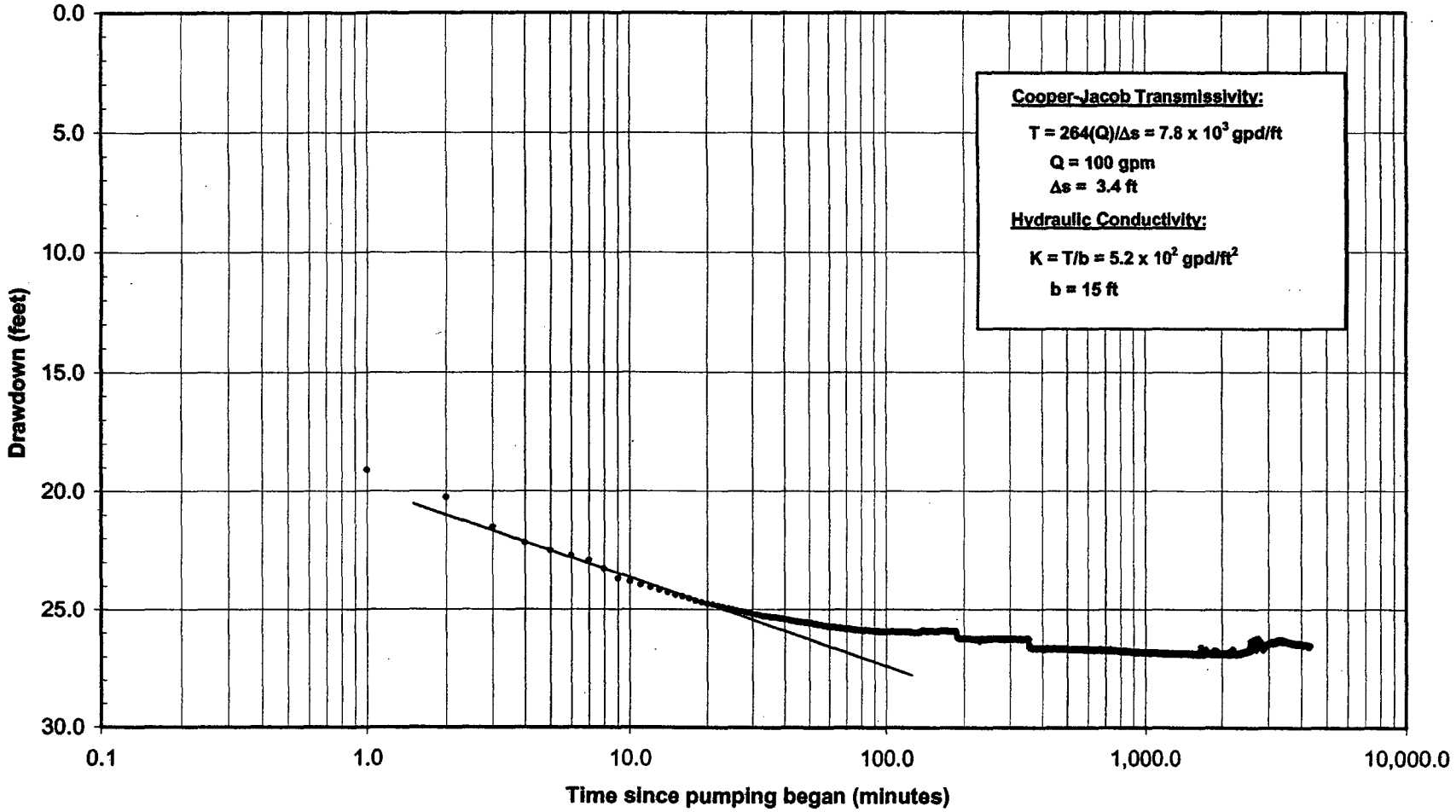

TW-4AD 72-Hour Constant-rate Pumping Test #1
Observation Well TW-4AS
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
256.0
254.0
252.0
250.0
248.0
246.0
244.0
242.0
240.0
238.0
TW-4AD step test
Start of TW-4AD pumping test
5/15/2003 0:00
5/16/2003 0:00
5/17/2003 0:00
5/18/2003 0:00
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
Date


TW-4AD 72-Hour Constant-rate Pumping Test #1
Observation Well TW-6
time vs. drawdown
0.0
0.5
1.0
1.5
2.0
Drawdown (feet)
1
10
100
1,000
10,000
Time since pumping began (minutes)

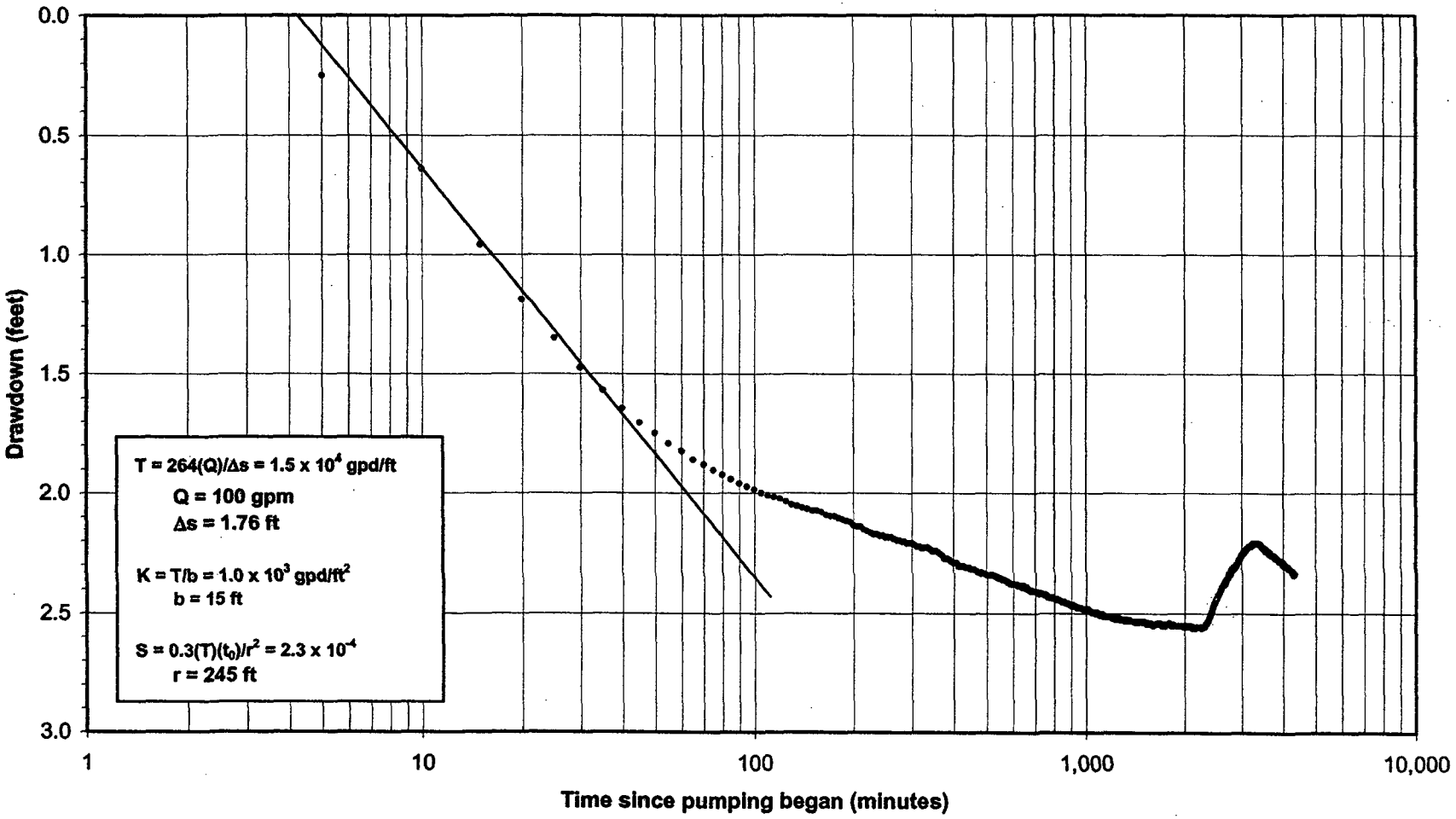

TW-4AD 72-Hour Constant-Rate Pumping Test #1
Observation Well TW-6
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
250.00
249.75
249.50
249.25
249.00
248.75
248.50
248.25
248.00
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/19/2003 0:00
5/20/2003 0:00
5/21/2003 0:00
5/22/2003 0:00
5/23/2003 0:00
5/24/2003 0:00
5/25/2003 0:00
5/26/2003 0:00
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
Date

TW-4AD 72 Hour Constant-Rate Pumping Test #2 Data

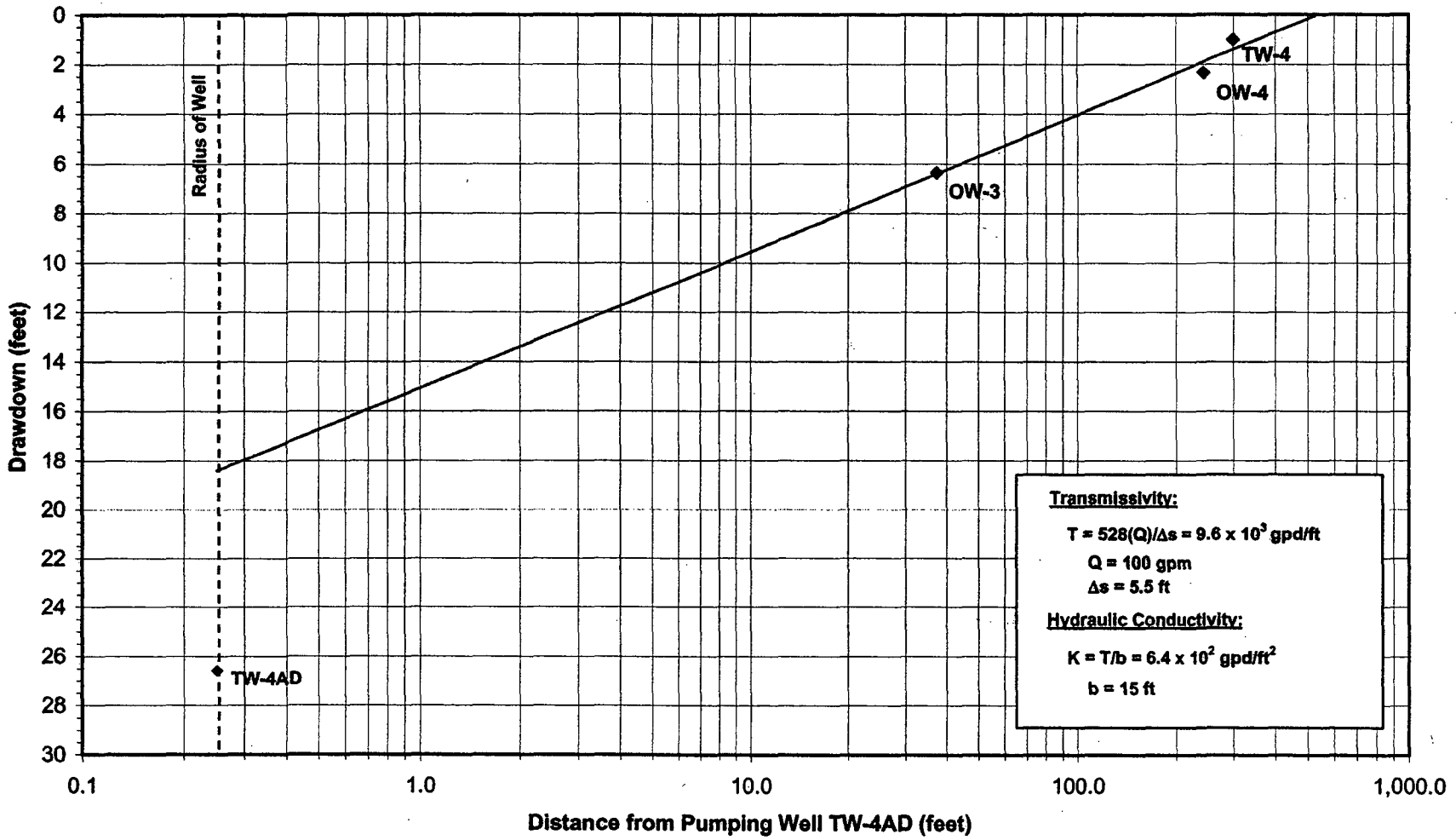
TW-4AD 72-Hour Constant-rate Pumping Test #2
Test Well TW-4AD
time vs. drawdown



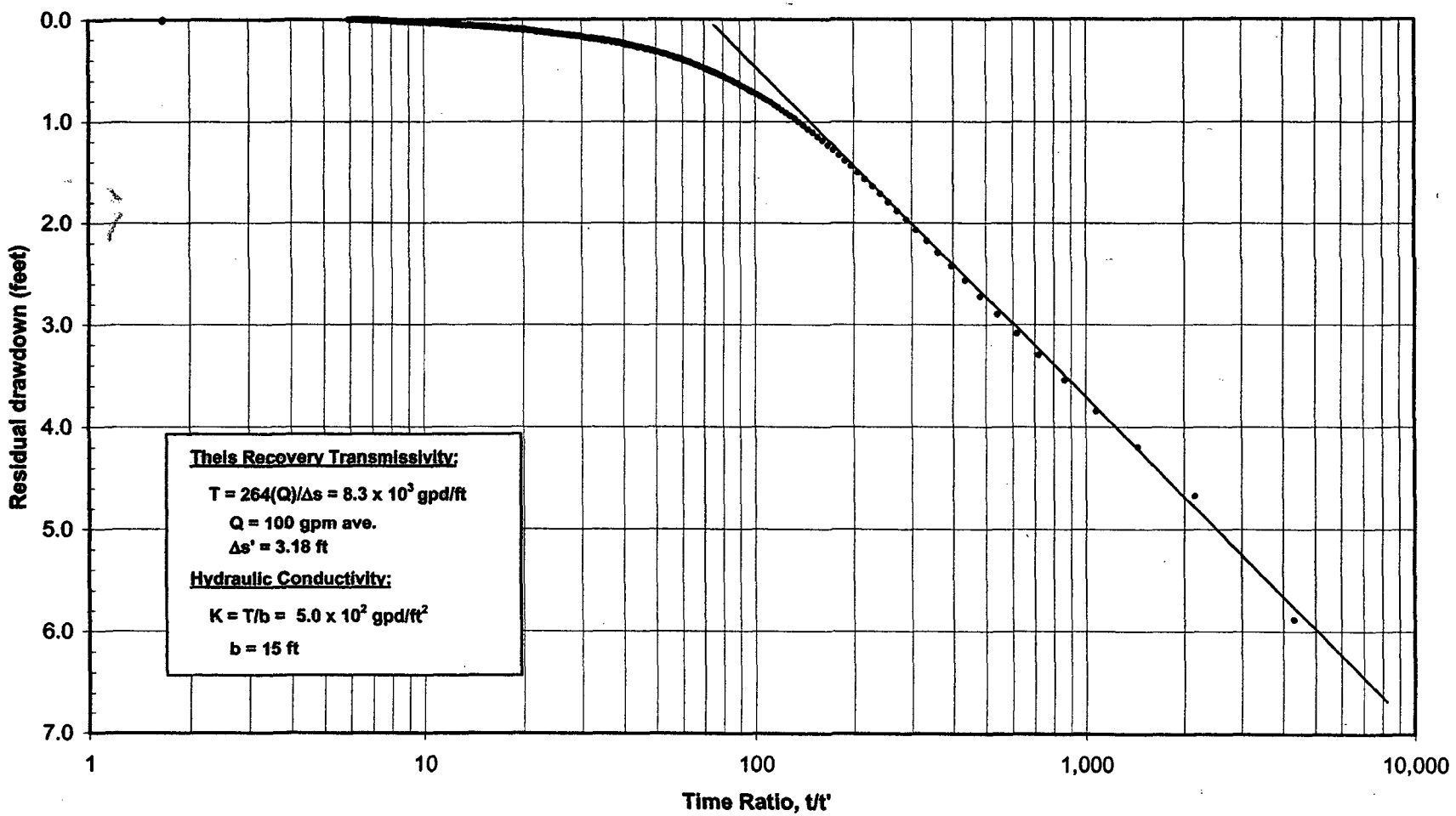
TW-4AD 72-Hour Constant-rate Pumping Test #2
Observation Well OW-4
time vs. drawdown

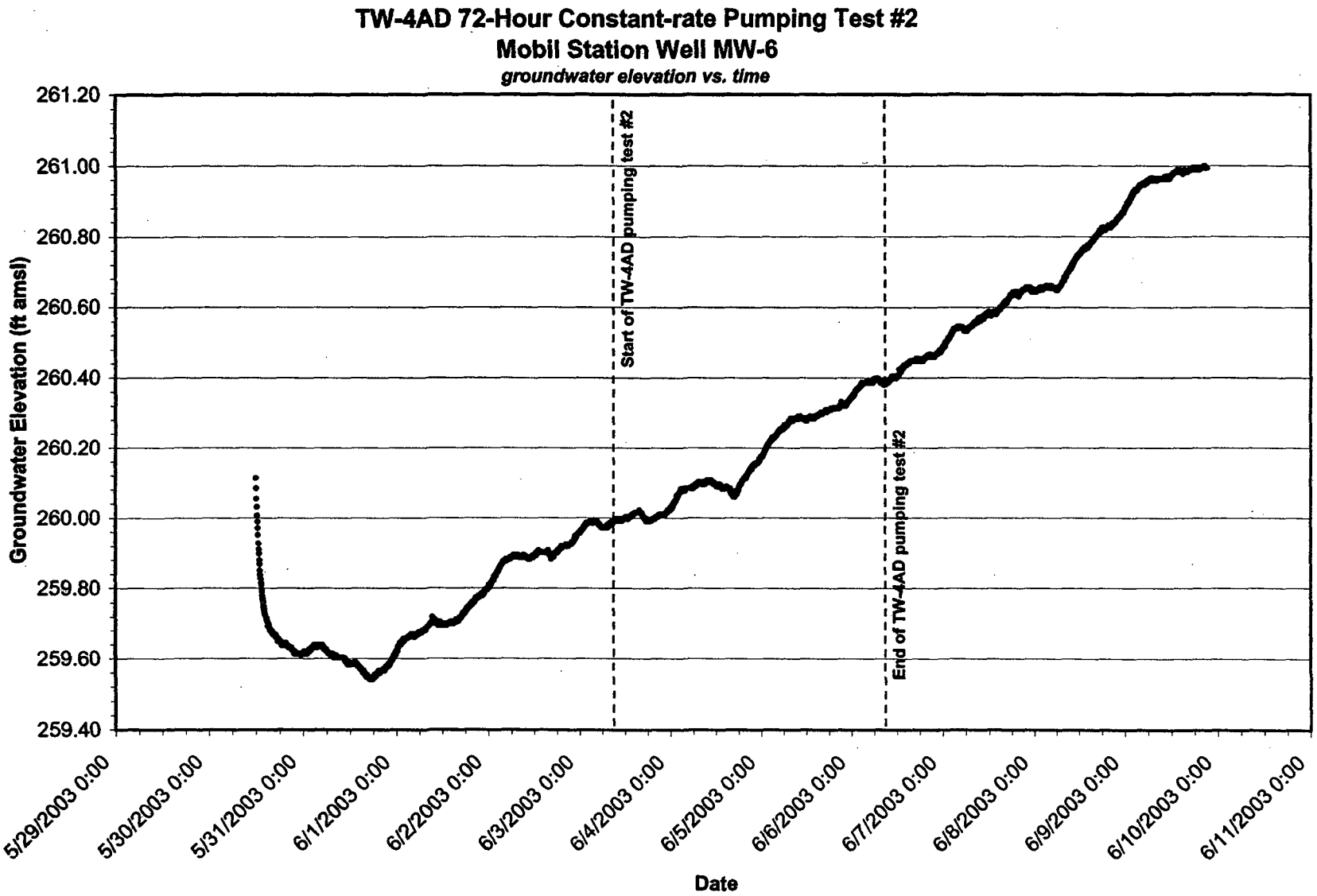


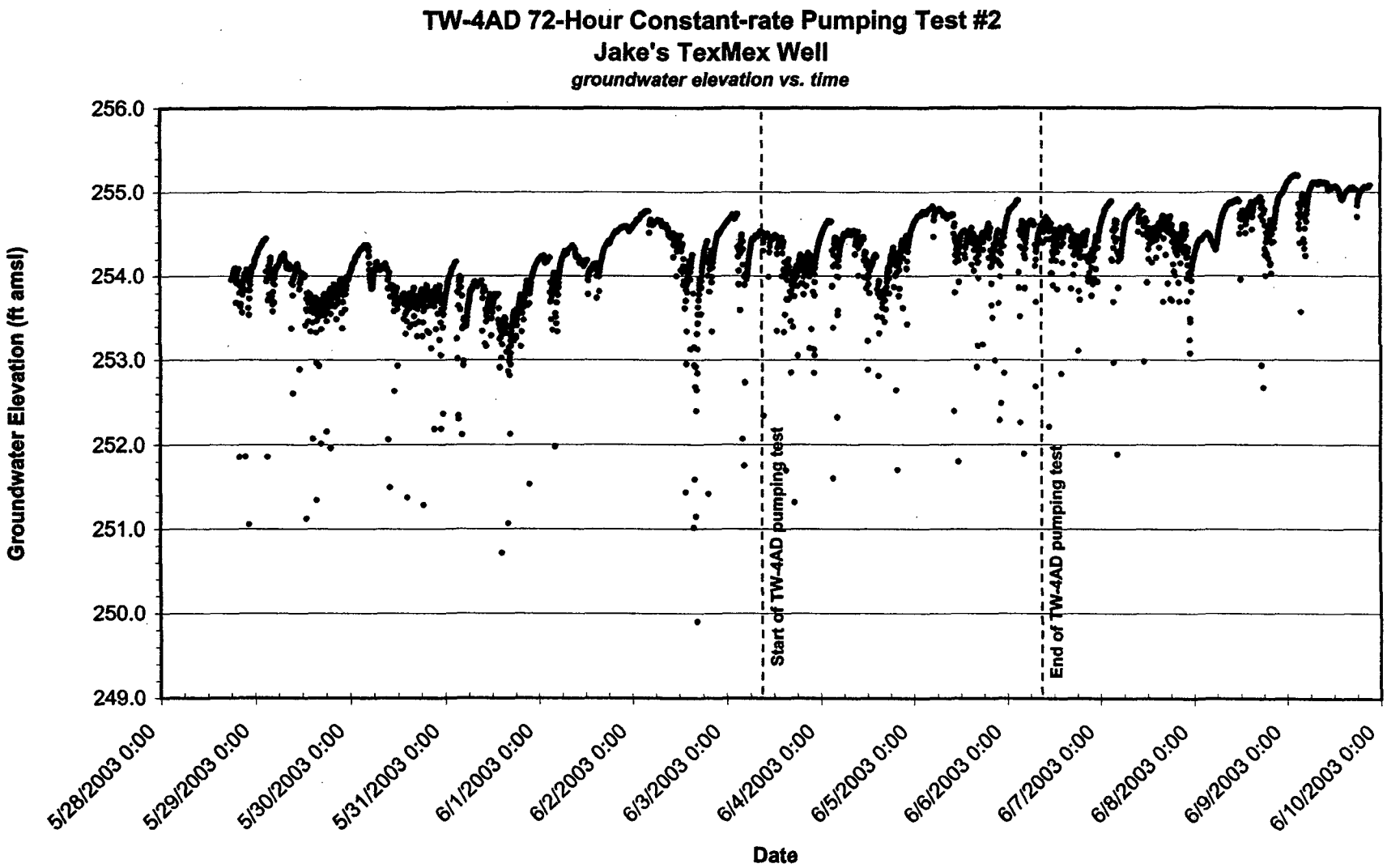
TW-4AD 72-Hour Constant-rate Pumping Test #2
72-Hour Distance-drawdown

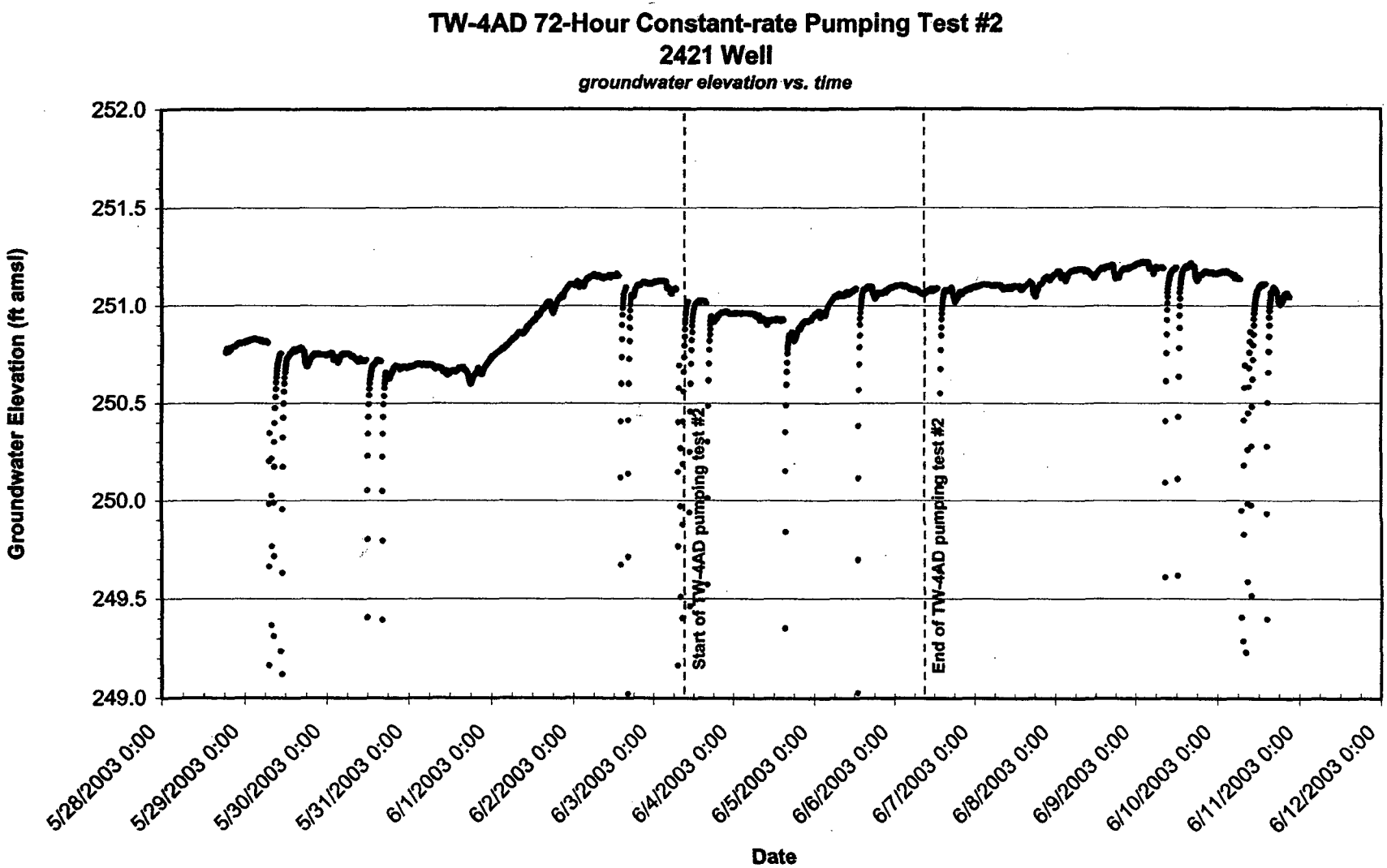


TW-4AD 72-Hour Constant-rate Pumping Test #2
TW-4AD Recovery Analysis
time ratio vs. residual drawdown

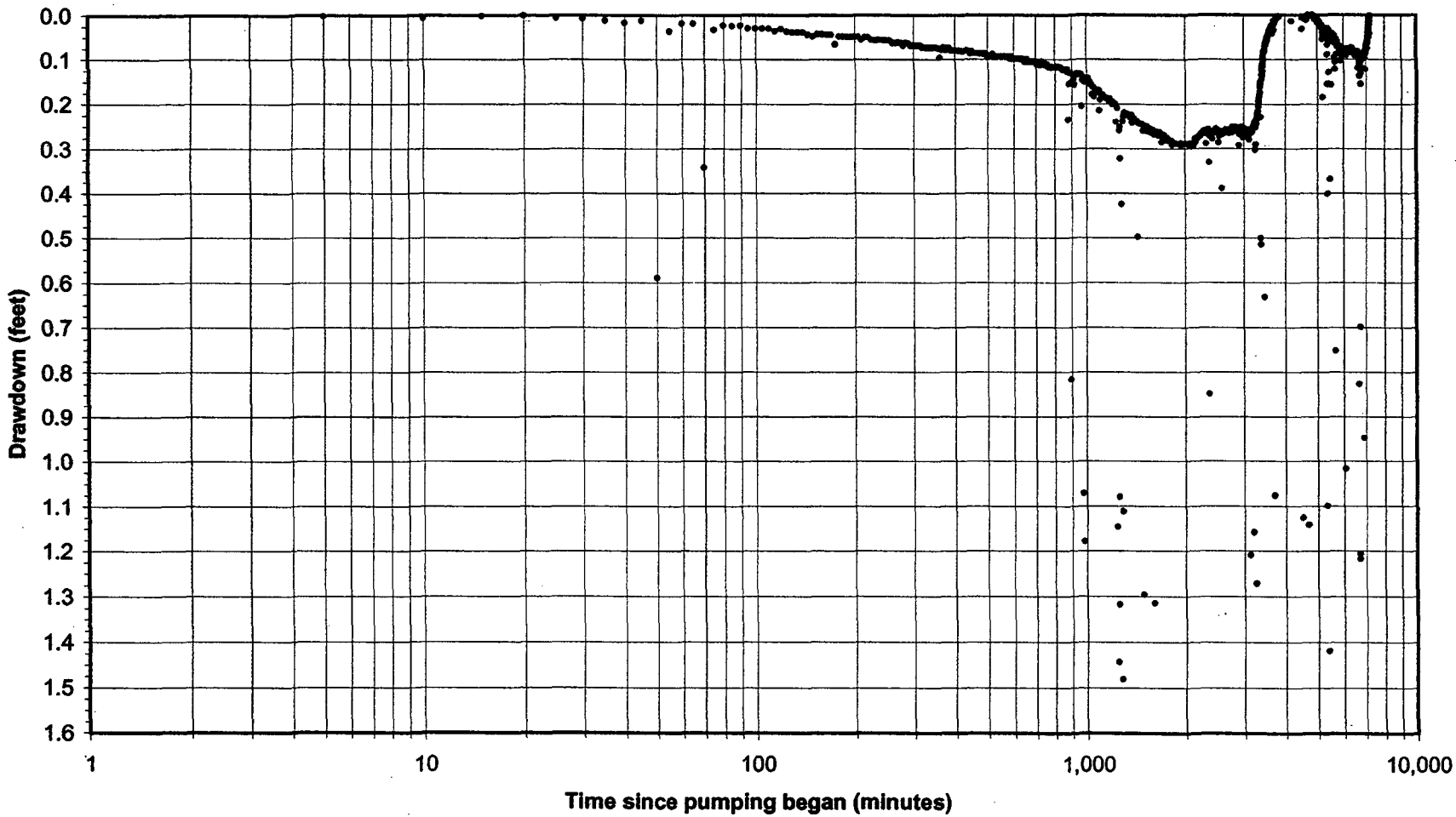


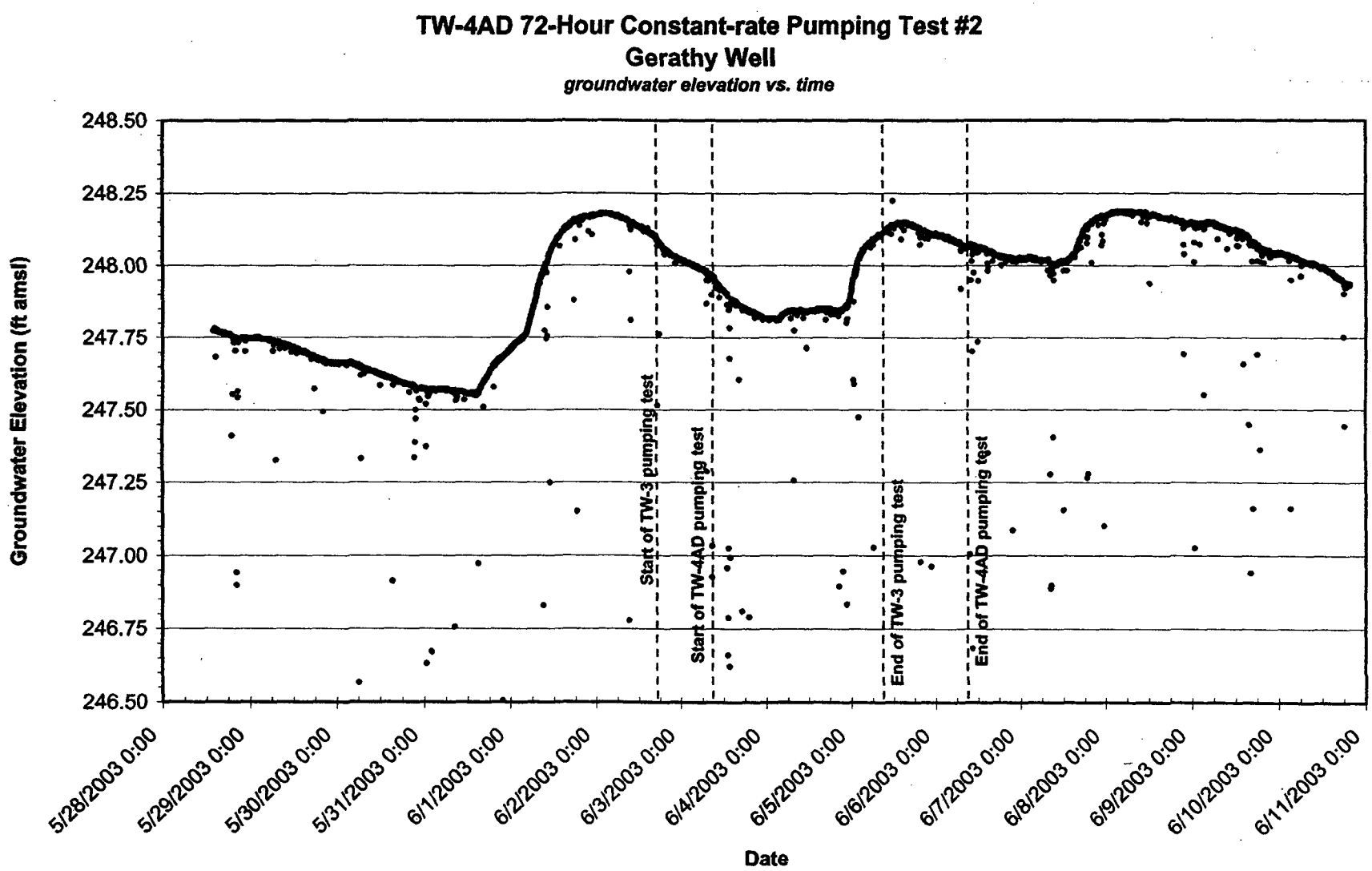

TW-4AD 72-Hour Constant-rate Pumping Test #2
Mobil Station Well MW-6
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
261.20
261.00
260.80
260.60
260.40
260.20
260.00
259.80
259.60
259.40
Start of TW-4AD pumping test #2
End of TW-4AD pumping test #2
5/29/2003 0:00
5/30/2003 0:00
5/31/2003 0:00
6/1/2003 0:00
6/2/2003 0:00
6/3/2003 0:00
6/4/2003 0:00
6/5/2003 0:00
6/6/2003 0:00
6/7/2003 0:00
6/8/2003 0:00
6/9/2003 0:00
6/10/2003 0:00
6/11/2003 0:00
Date

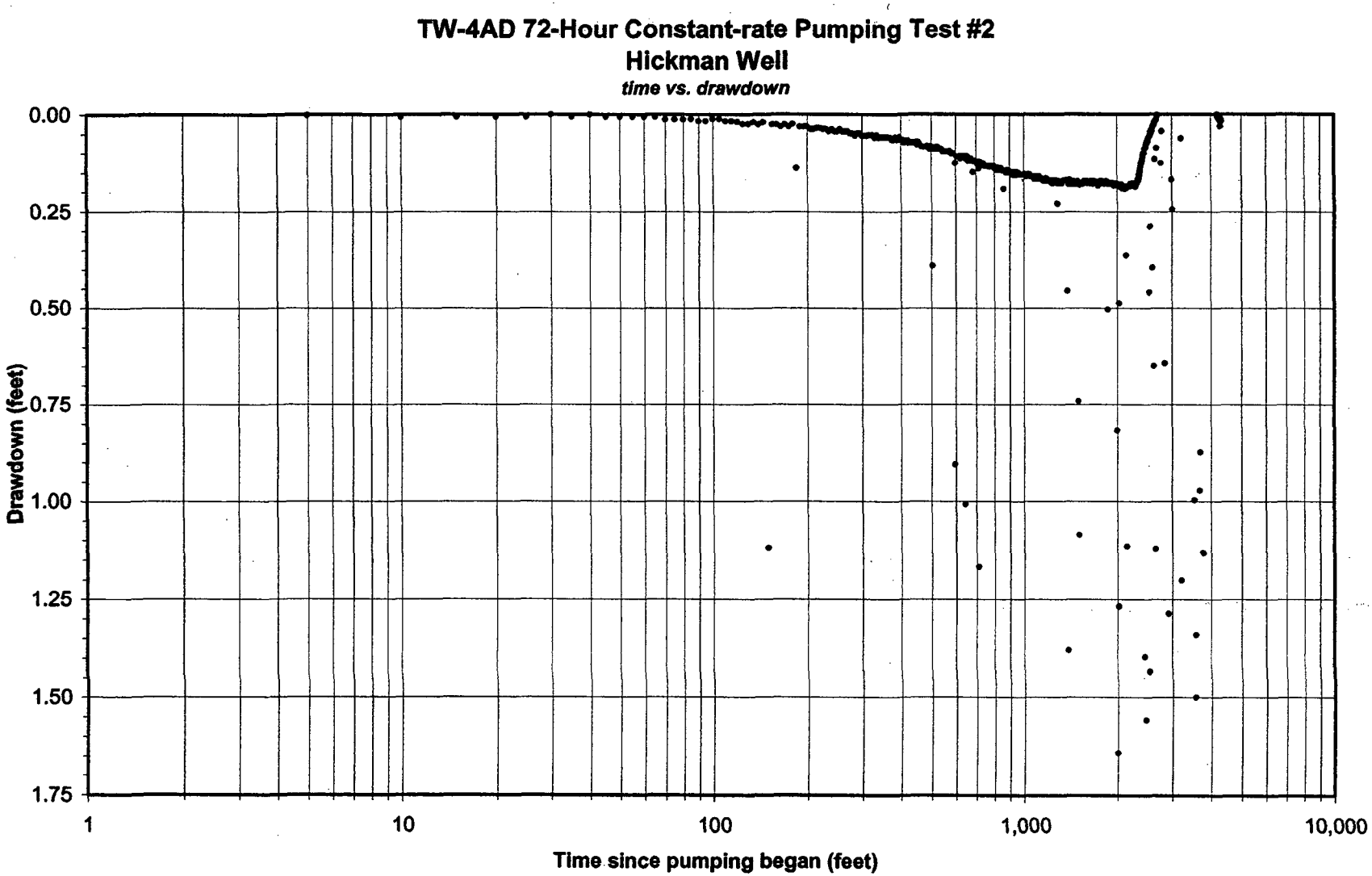

TW-4AD 72-Hour Constant-rate Pumping Test #2
Jake's TexMex Well
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
256.0
255.0
254.0
253.0
252.0
251.0
250.0
249.0
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/28/2003 0:00
5/29/2003 0:00
5/30/2003 0:00
5/31/2003 0:00
6/1/2003 0:00
6/2/2003 0:00
6/3/2003 0:00
6/4/2003 0:00
6/5/2003 0:00
6/6/2003 0:00
6/7/2003 0:00
6/8/2003 0:00
6/9/2003 0:00
6/10/2003 0:00
Date

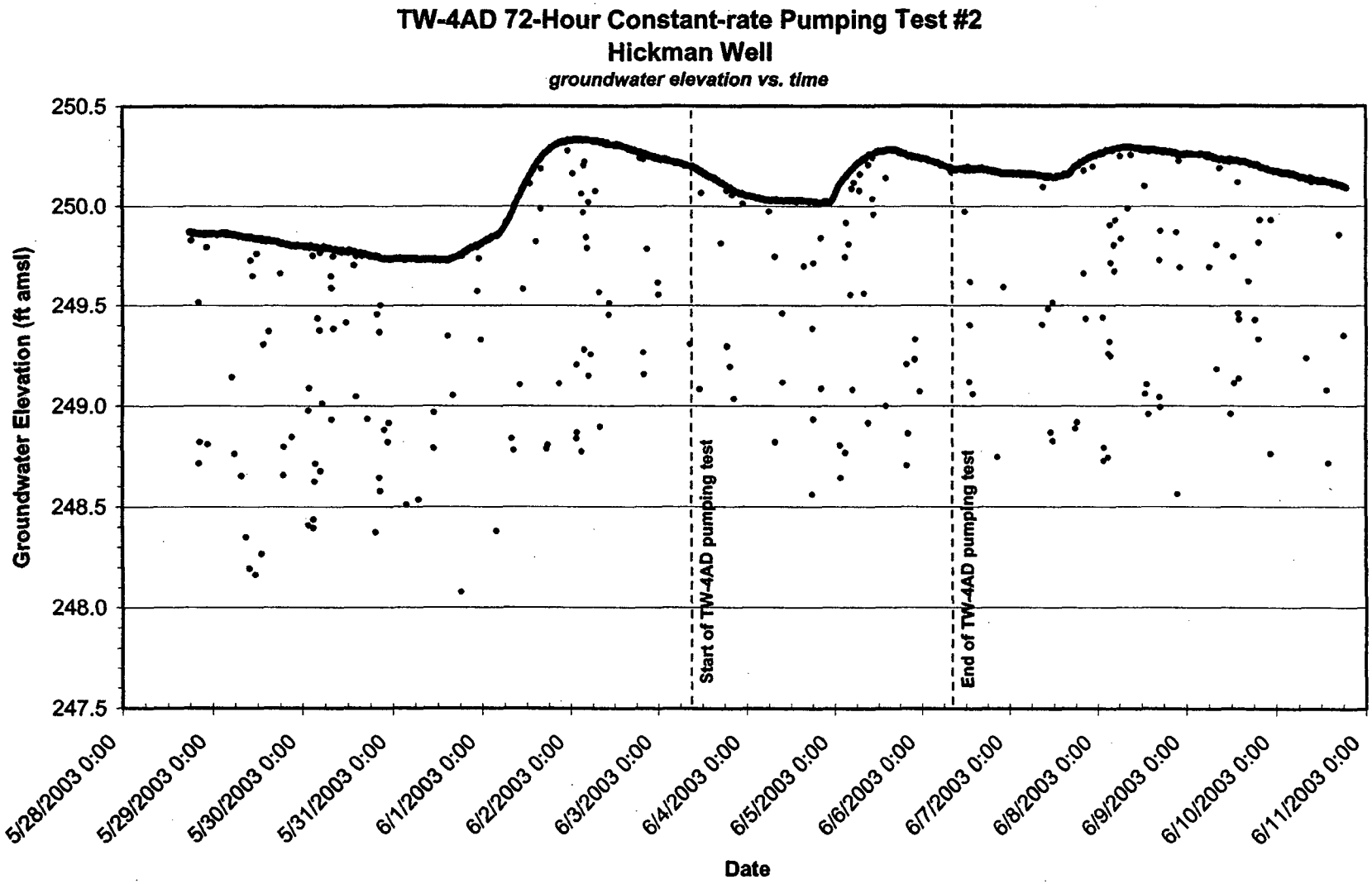

TW-4AD 72-Hour Constant-rate Pumping Test #2
2421 Well
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
252.0
251.5
251.0
250.5
250.0
249.5
249.0
Start of TW-4AD pumping test #2
End of TW-4AD pumping test #2
5/28/2003 0:00
5/29/2003 0:00
5/30/2003 0:00
5/31/2003 0:00
6/1/2003 0:00
6/2/2003 0:00
6/3/2003 0:00
6/4/2003 0:00
6/5/2003 0:00
6/6/2003 0:00
6/7/2003 0:00
6/8/2003 0:00
6/9/2003 0:00
6/10/2003 0:00
6/11/2003 0:00
6/12/2003 0:00
Date

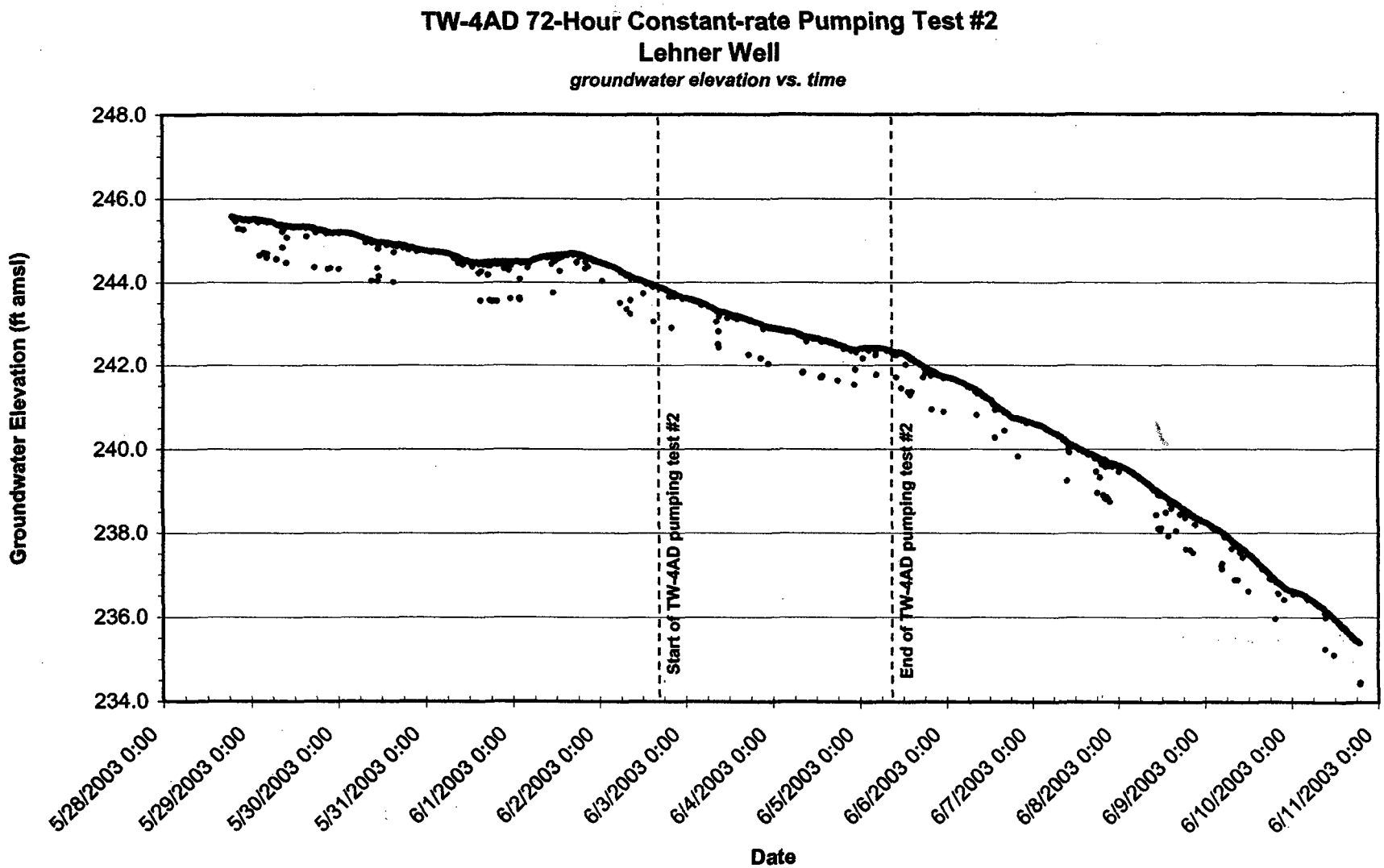
TW-4AD 72-Hour Constant-rate Pumping Test #2
Gerathy Well
time vs. drawdown



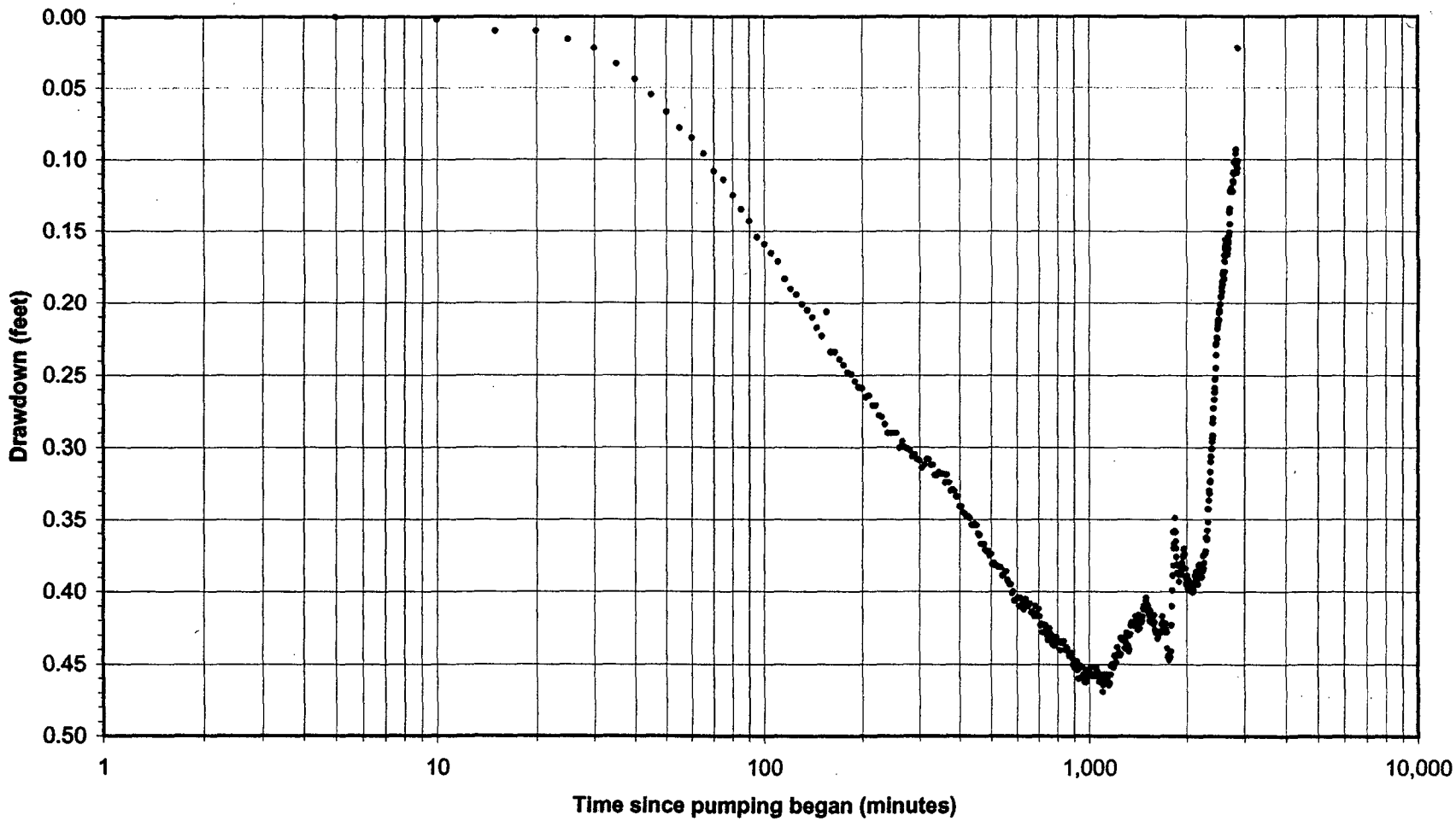

TW-4AD 72-Hour Constant-rate Pumping Test #2
Gerathy Well
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
248.50
248.25
248.00
247.75
247.50
247.25
247.00
246.75
246.50
Start of TW-3 pumping test
Start of TW-4AD pumping test
End of TW-3 pumping test
End of TW-4AD pumping test
5/28/2003 0:00
5/29/2003 0:00
5/30/2003 0:00
5/31/2003 0:00
6/1/2003 0:00
6/2/2003 0:00
6/3/2003 0:00
6/4/2003 0:00
6/5/2003 0:00
6/6/2003 0:00
6/7/2003 0:00
6/8/2003 0:00
6/9/2003 0:00
6/10/2003 0:00
6/11/2003 0:00
Date

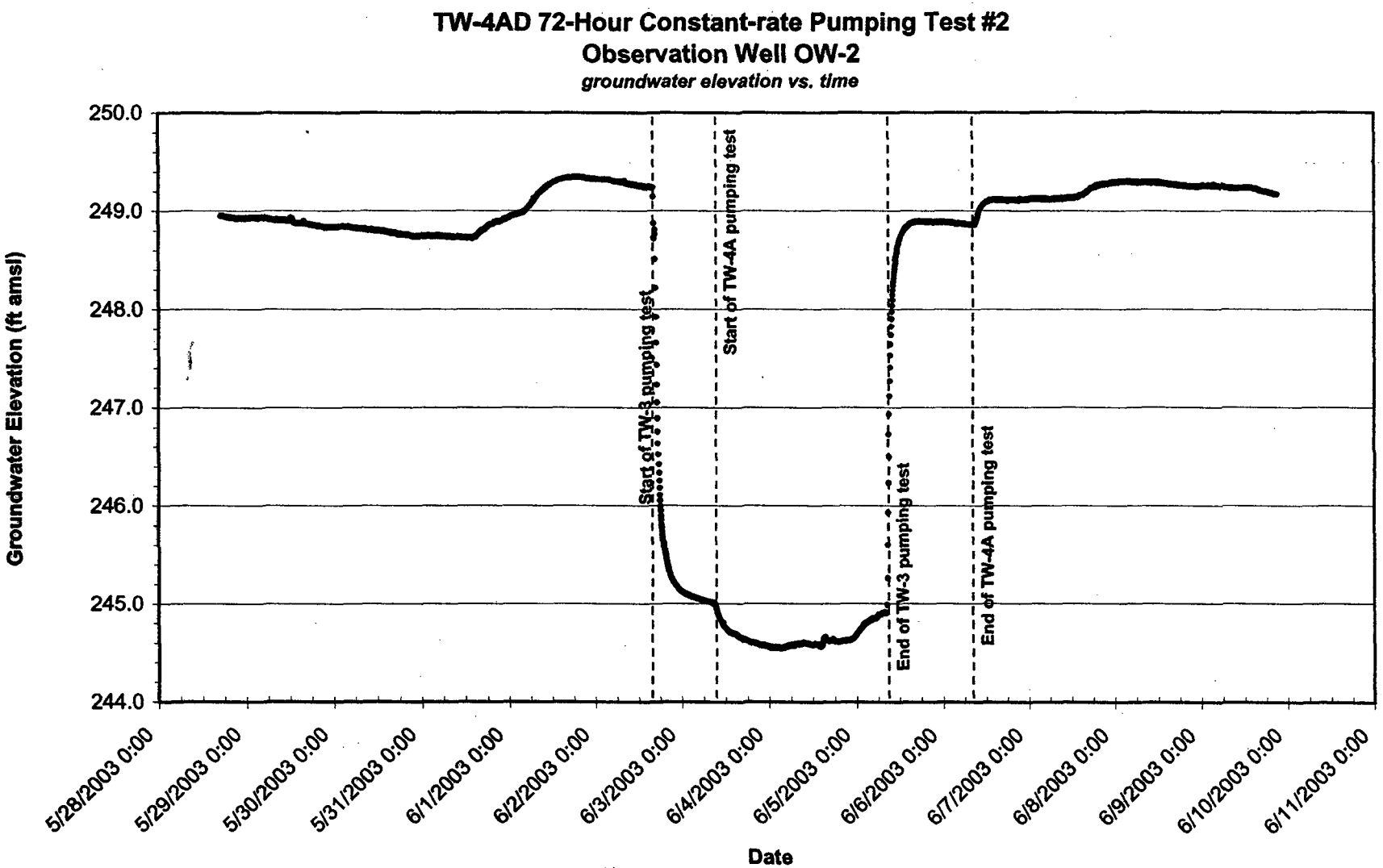

TW-4AD 72-Hour Constant-rate Pumping Test #2
Hickman Well
time vs. drawdown
Drawdown (feet)
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
1
10
100
1,000
10,000
Time since pumping began (feet)


TW-4AD 72-Hour Constant-rate Pumping Test #2
Hickman Well
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
250.5
250.0
249.5
249.0
248.5
248.0
247.5
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/28/2003 0:00
5/29/2003 0:00
5/30/2003 0:00
5/31/2003 0:00
6/1/2003 0:00
6/2/2003 0:00
6/3/2003 0:00
6/4/2003 0:00
6/5/2003 0:00
6/6/2003 0:00
6/7/2003 0:00
6/8/2003 0:00
6/9/2003 0:00
6/10/2003 0:00
6/11/2003 0:00
Date

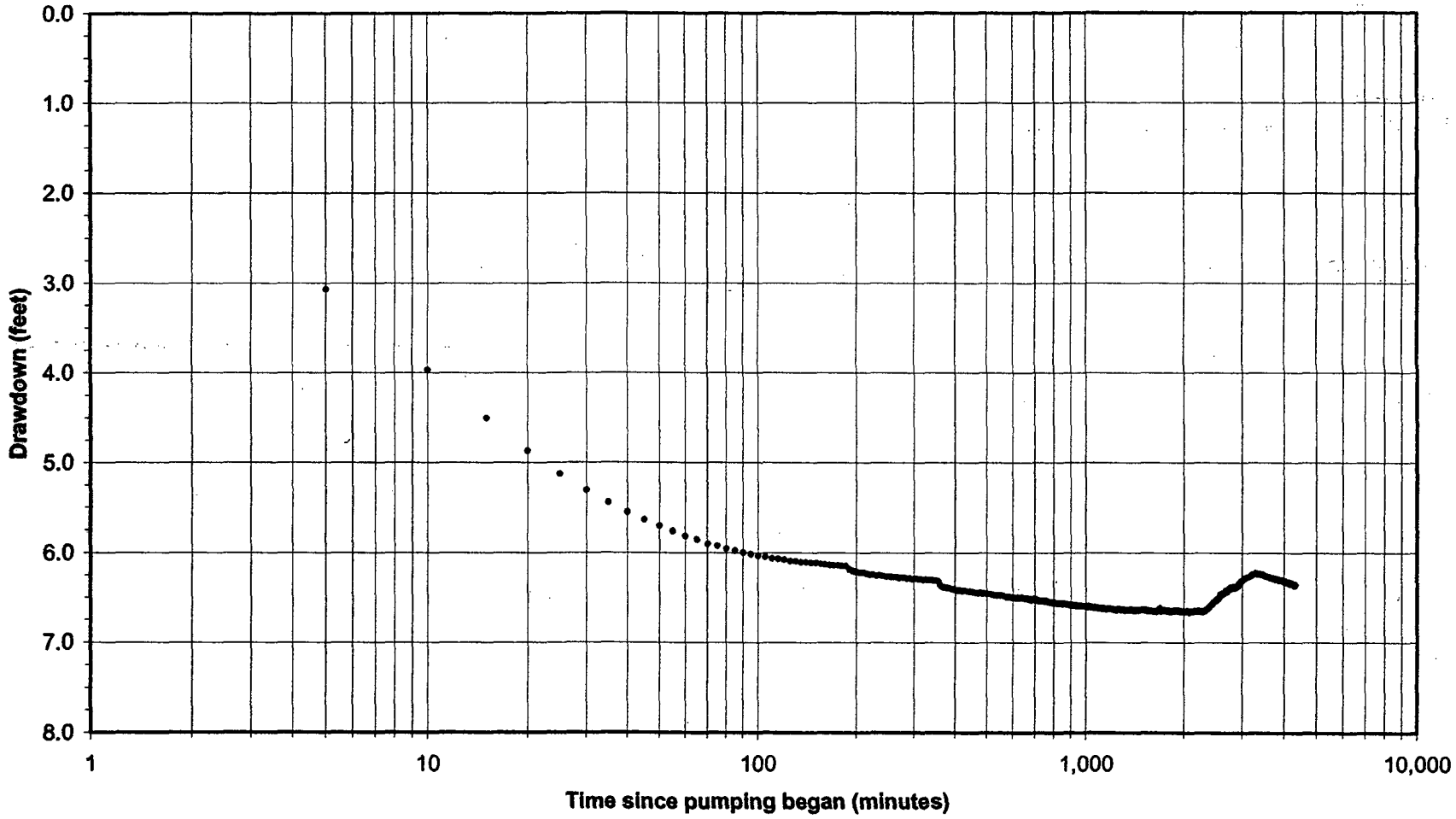

TW-4AD 72-Hour Constant-rate Pumping Test #2
Lehner Well
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
248.0
246.0
244.0
242.0
240.0
238.0
236.0
234.0
Start of TW-4AD pumping test #2
End of TW-4AD pumping test #2
5/28/2003 0:00
5/29/2003 0:00
5/30/2003 0:00
5/31/2003 0:00
6/1/2003 0:00
6/2/2003 0:00
6/3/2003 0:00
6/4/2003 0:00
6/5/2003 0:00
6/6/2003 0:00
6/7/2003 0:00
6/8/2003 0:00
6/9/2003 0:00
6/10/2003 0:00
6/11/2003 0:00
Date

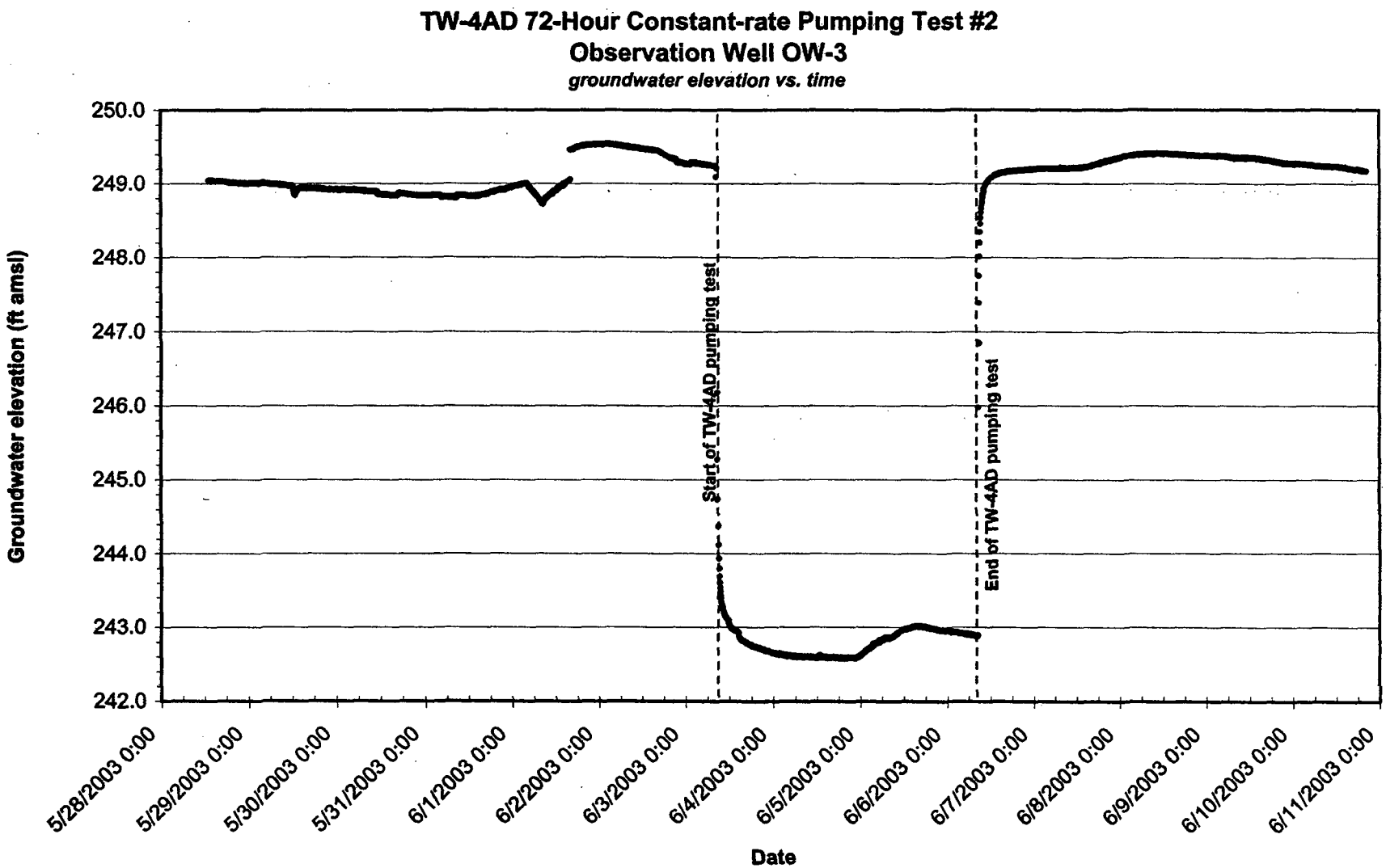
TW-4AD 72-Hour Constant-rate Pumping Test #2
Observation Well OW-2
time vs. drawdown

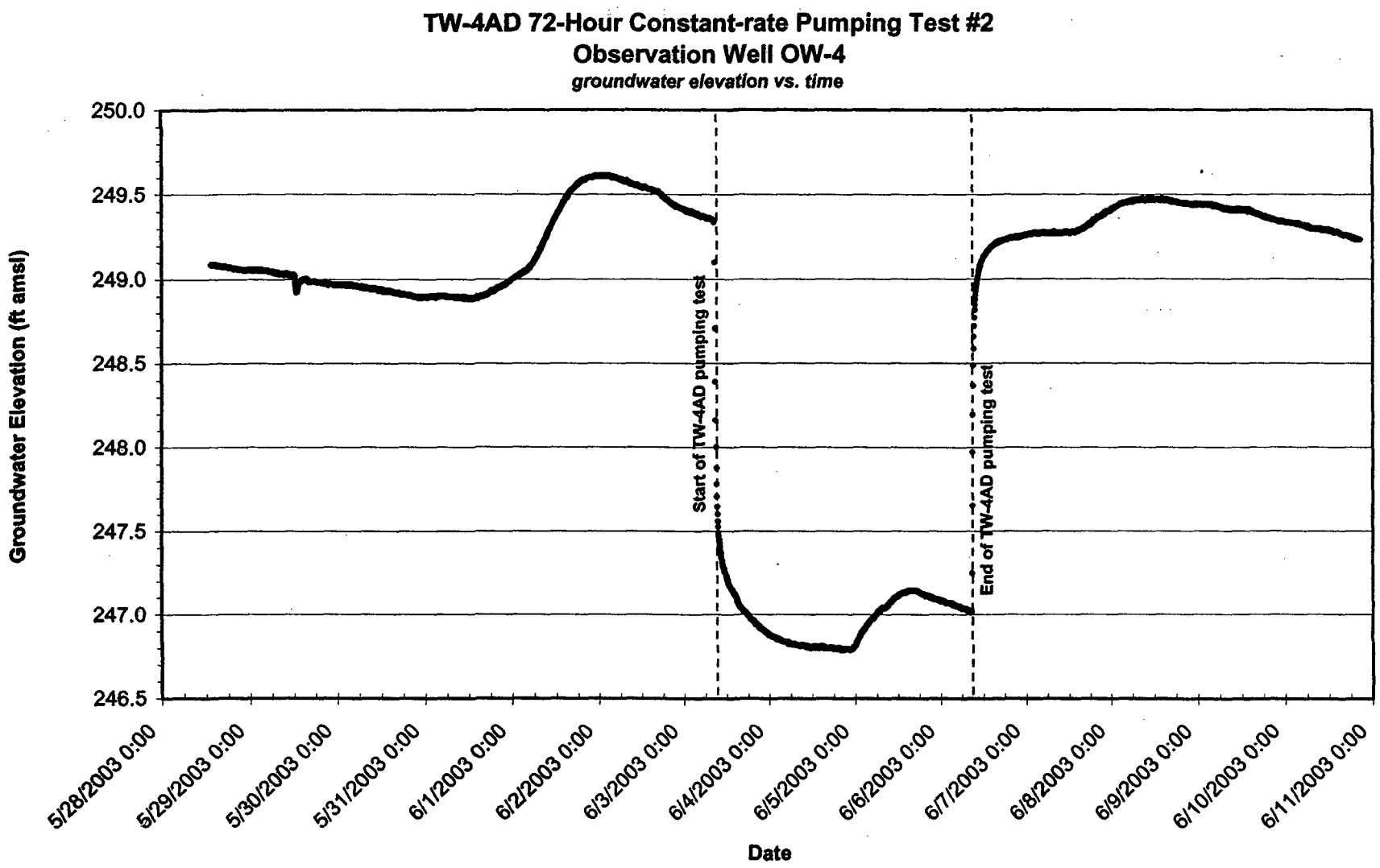



TW-4AD 72-Hour Constant-rate Pumping Test #2
Observation Well OW-2
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
250.0
249.0
248.0
247.0
246.0
245.0
244.0
Start of TW-3 pumping test
Start of TW-4A pumping test
End of TW-3 pumping test
End of TW-4A pumping test
5/28/2003 0:00
5/29/2003 0:00
5/30/2003 0:00
5/31/2003 0:00
6/1/2003 0:00
6/2/2003 0:00
6/3/2003 0:00
6/4/2003 0:00
6/5/2003 0:00
6/6/2003 0:00
6/7/2003 0:00
6/8/2003 0:00
6/9/2003 0:00
6/10/2003 0:00
6/11/2003 0:00
Date

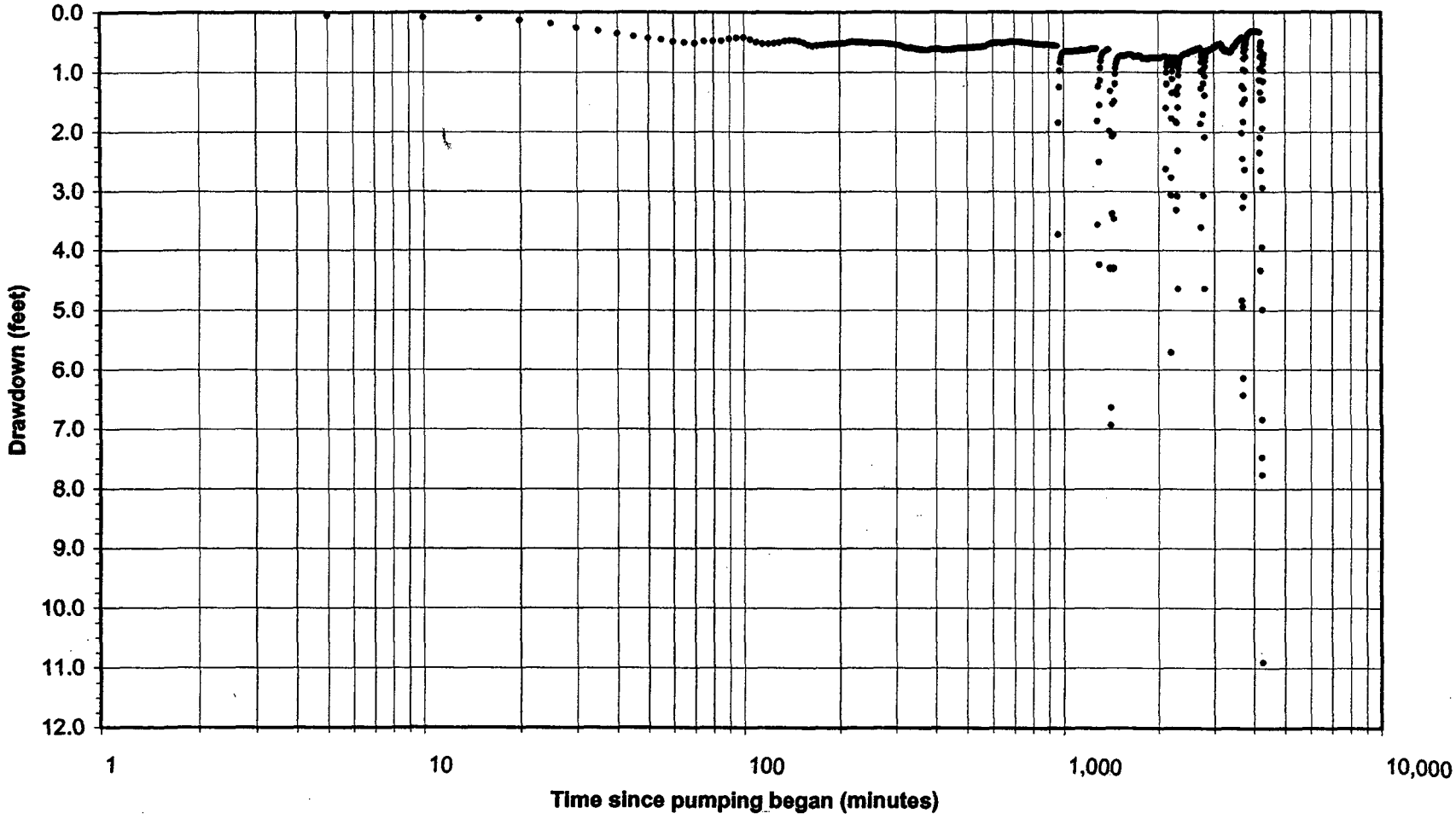
TW-4AD 72-Hour Constant-rate Pumping Test #2
Observation Well OW-3
time vs. drawdown

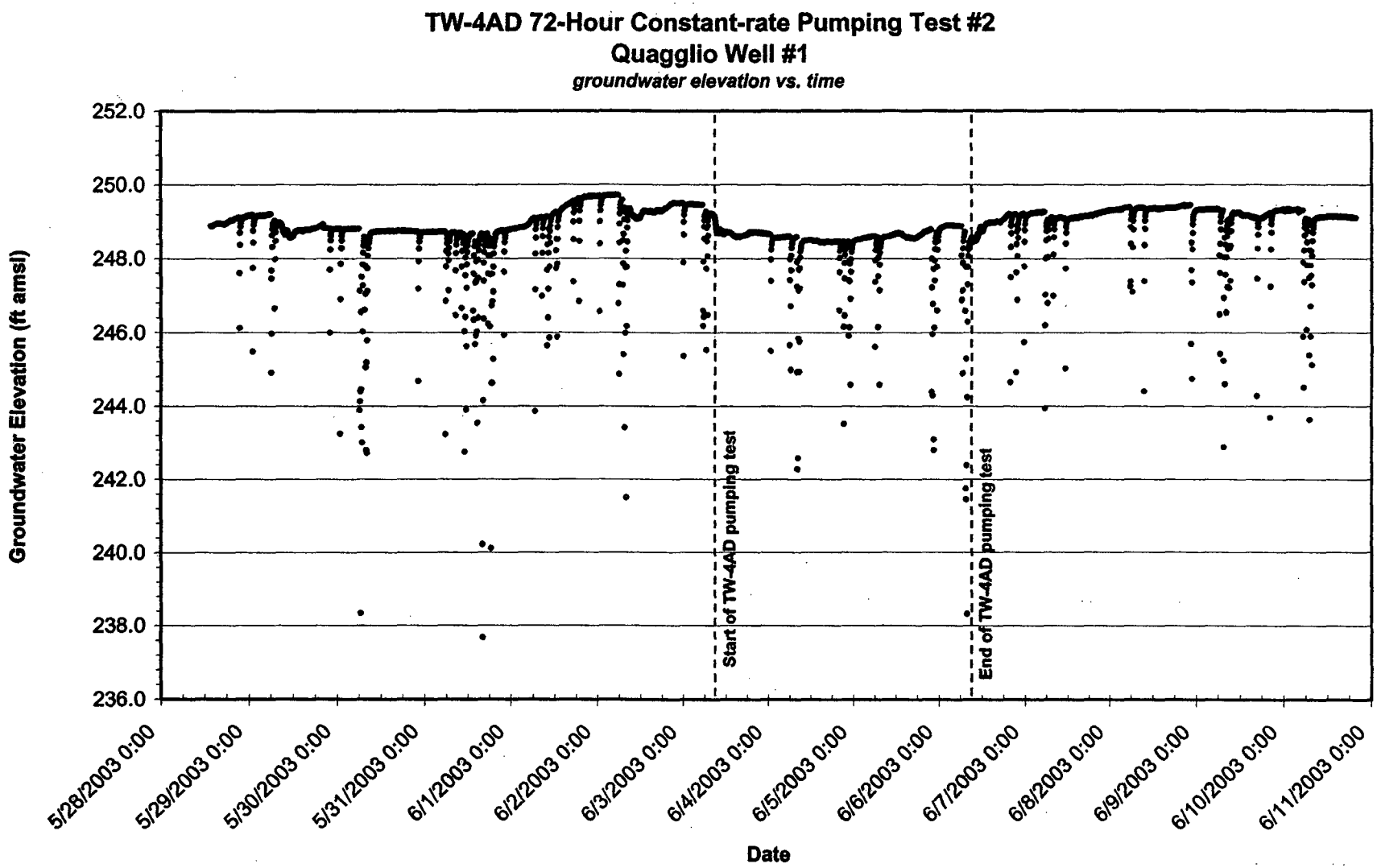



TW-4AD 72-Hour Constant-rate Pumping Test #2
Observation Well OW-3
groundwater elevation vs. time
Groundwater elevation (ft amsl)
250.0
249.0
248.0
247.0
246.0
245.0
244.0
243.0
242.0
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/28/2003 0:00
5/29/2003 0:00
5/30/2003 0:00
5/31/2003 0:00
6/1/2003 0:00
6/2/2003 0:00
6/3/2003 0:00
6/4/2003 0:00
6/5/2003 0:00
6/6/2003 0:00
6/7/2003 0:00
6/8/2003 0:00
6/9/2003 0:00
6/10/2003 0:00
6/11/2003 0:00
Date

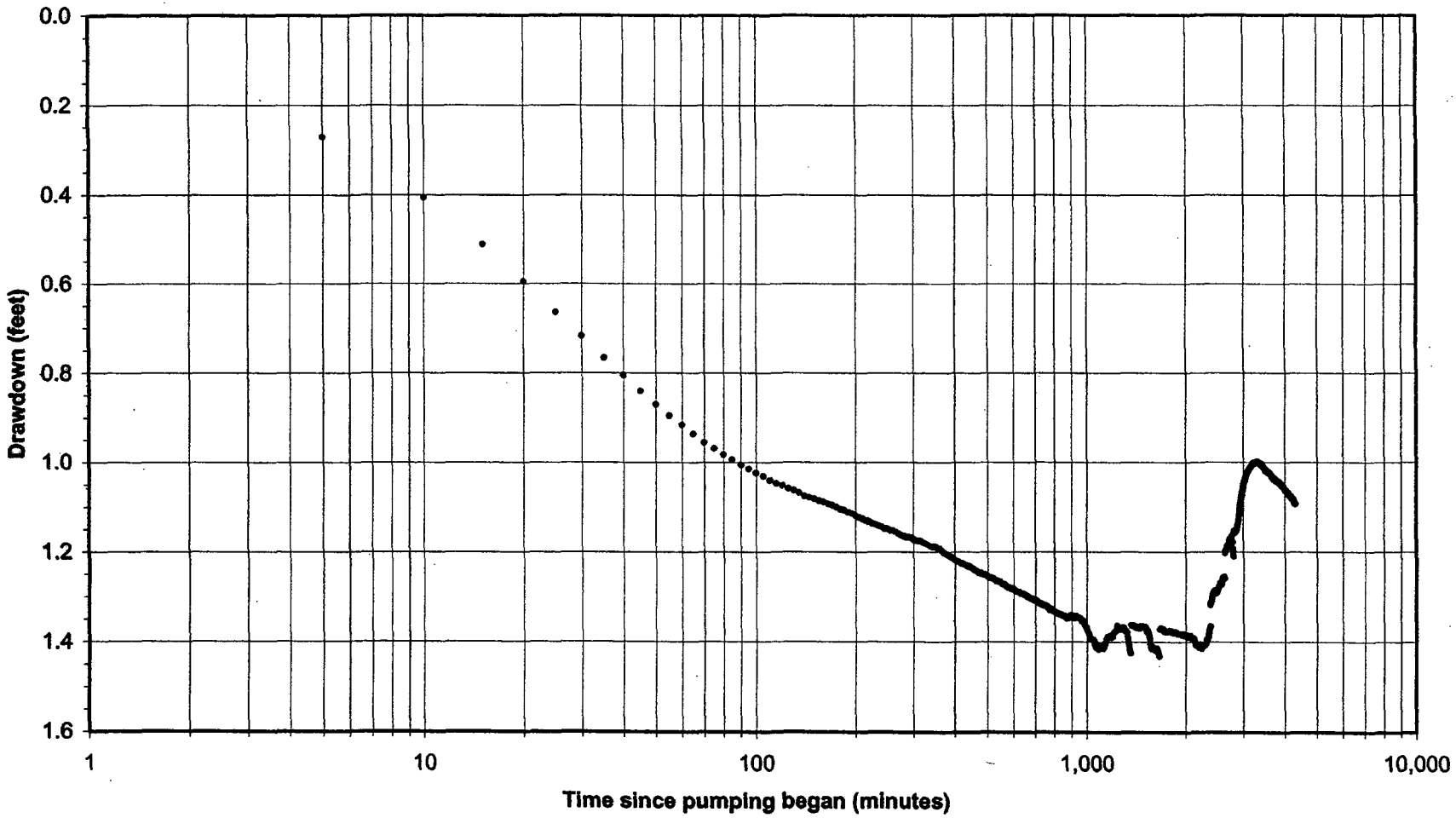

TW-4AD 72-Hour Constant-rate Pumping Test #2
Observation Well OW-4
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
250.0
249.5
249.0
248.5
248.0
247.5
247.0
246.5
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/28/2003 0:00
5/29/2003 0:00
5/30/2003 0:00
5/31/2003 0:00
6/1/2003 0:00
6/2/2003 0:00
6/3/2003 0:00
6/4/2003 0:00
6/5/2003 0:00
6/6/2003 0:00
6/7/2003 0:00
6/8/2003 0:00
6/9/2003 0:00
6/10/2003 0:00
6/11/2003 0:00
Date

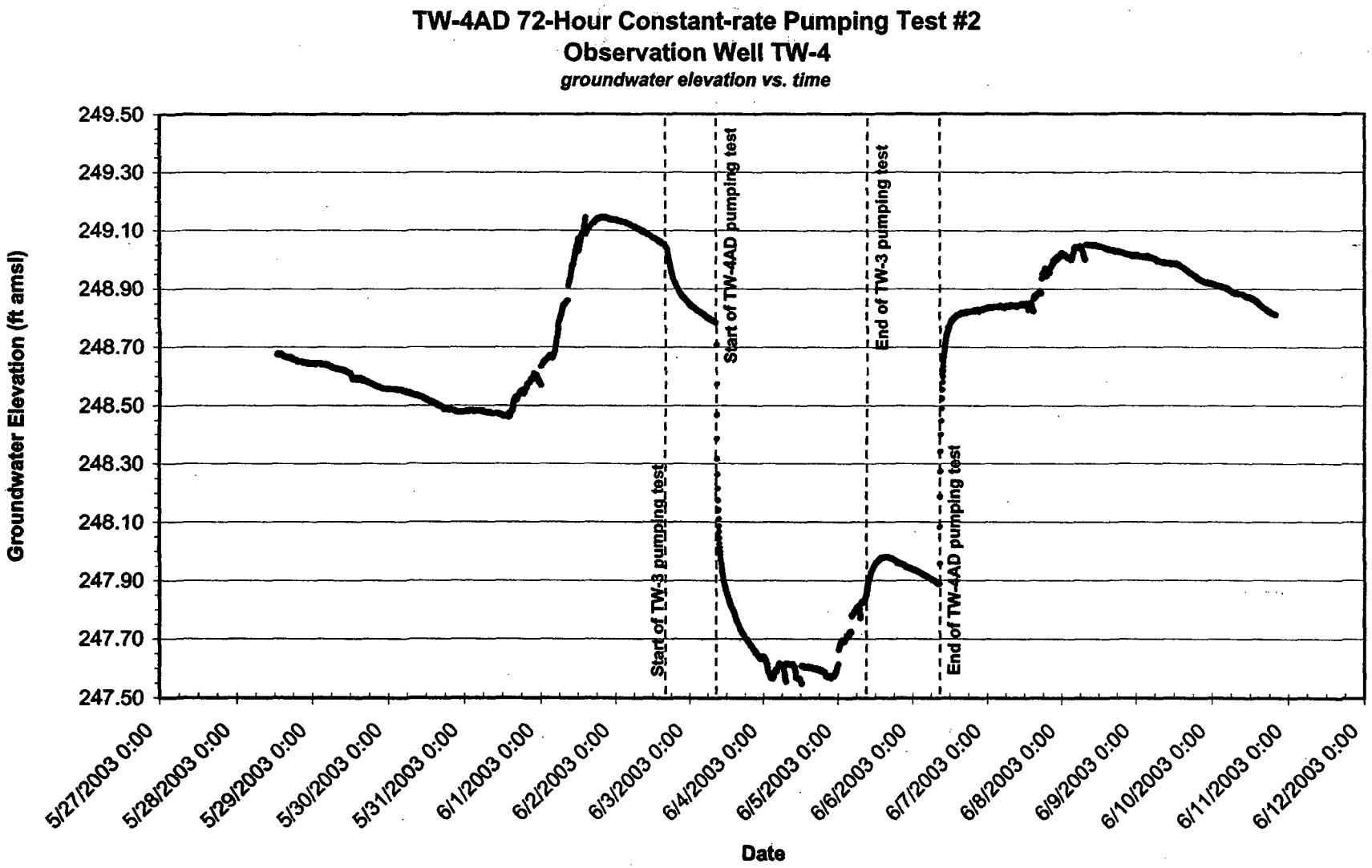
TW-4AD 72-Hour Constant-rate Pumping Test #2
Quagglio Well #1
time vs. drawdown



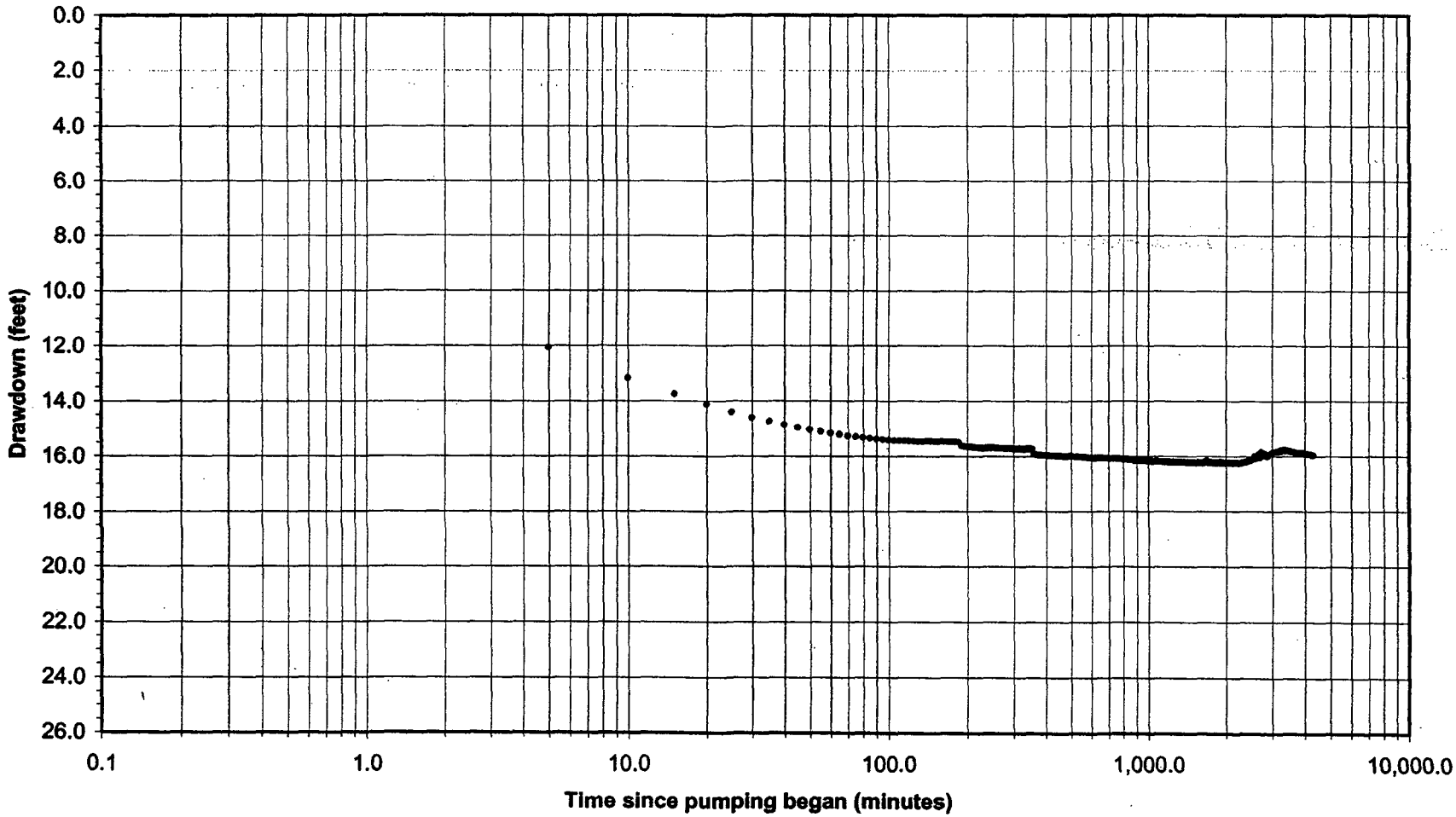

TW-4AD 72-Hour Constant-rate Pumping Test #2
Quagglio Well #1
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
252.0
250.0
248.0
246.0
244.0
242.0
240.0
238.0
236.0
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/28/2003 0:00
5/29/2003 0:00
5/30/2003 0:00
5/31/2003 0:00
6/1/2003 0:00
6/2/2003 0:00
6/3/2003 0:00
6/4/2003 0:00
6/5/2003 0:00
6/6/2003 0:00
6/7/2003 0:00
6/8/2003 0:00
6/9/2003 0:00
6/10/2003 0:00
6/11/2003 0:00
Date

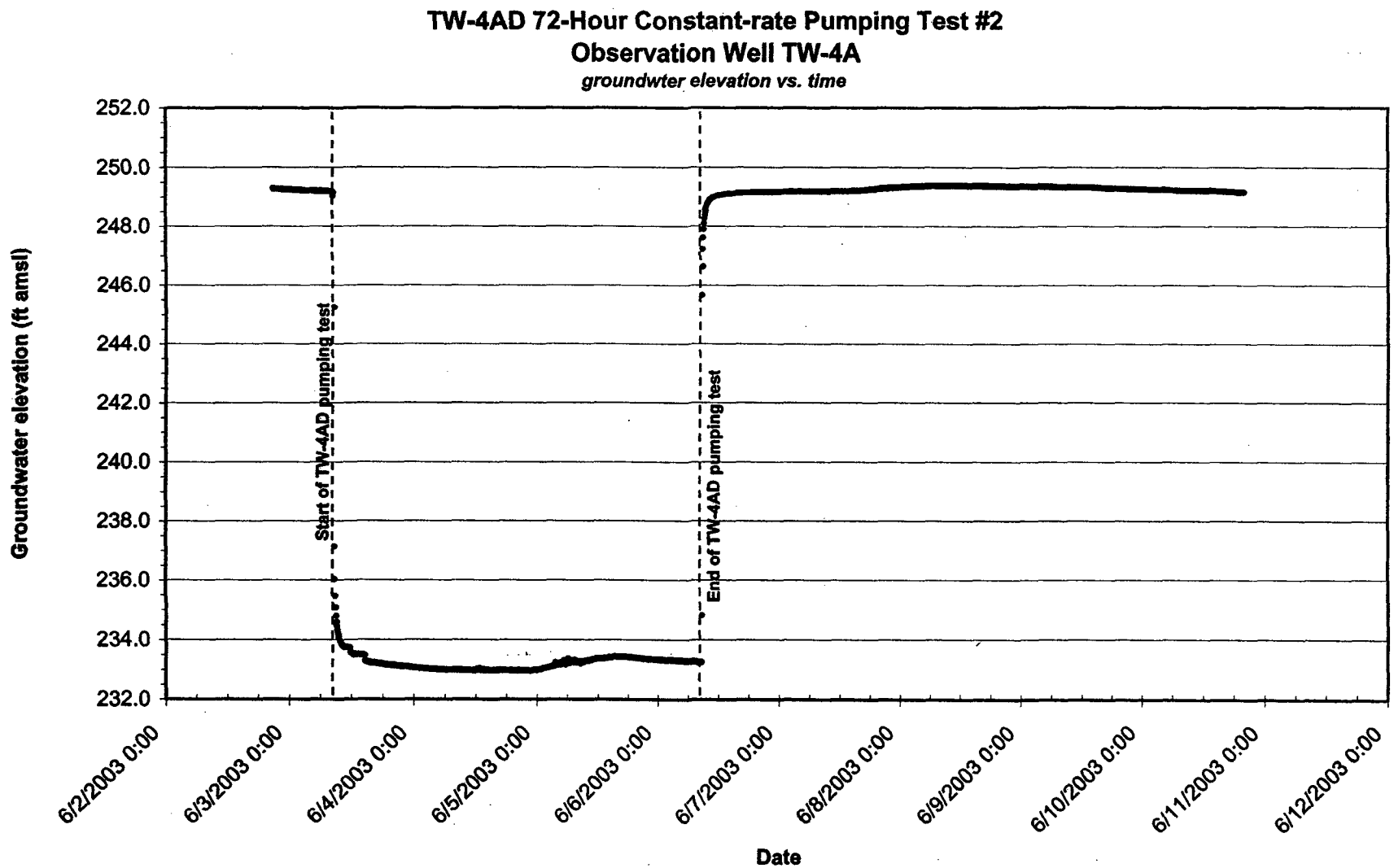
TW-4AD 72-Hour Constant-rate Pumping Test #2
Observation Well TW-4
time vs. drawdown



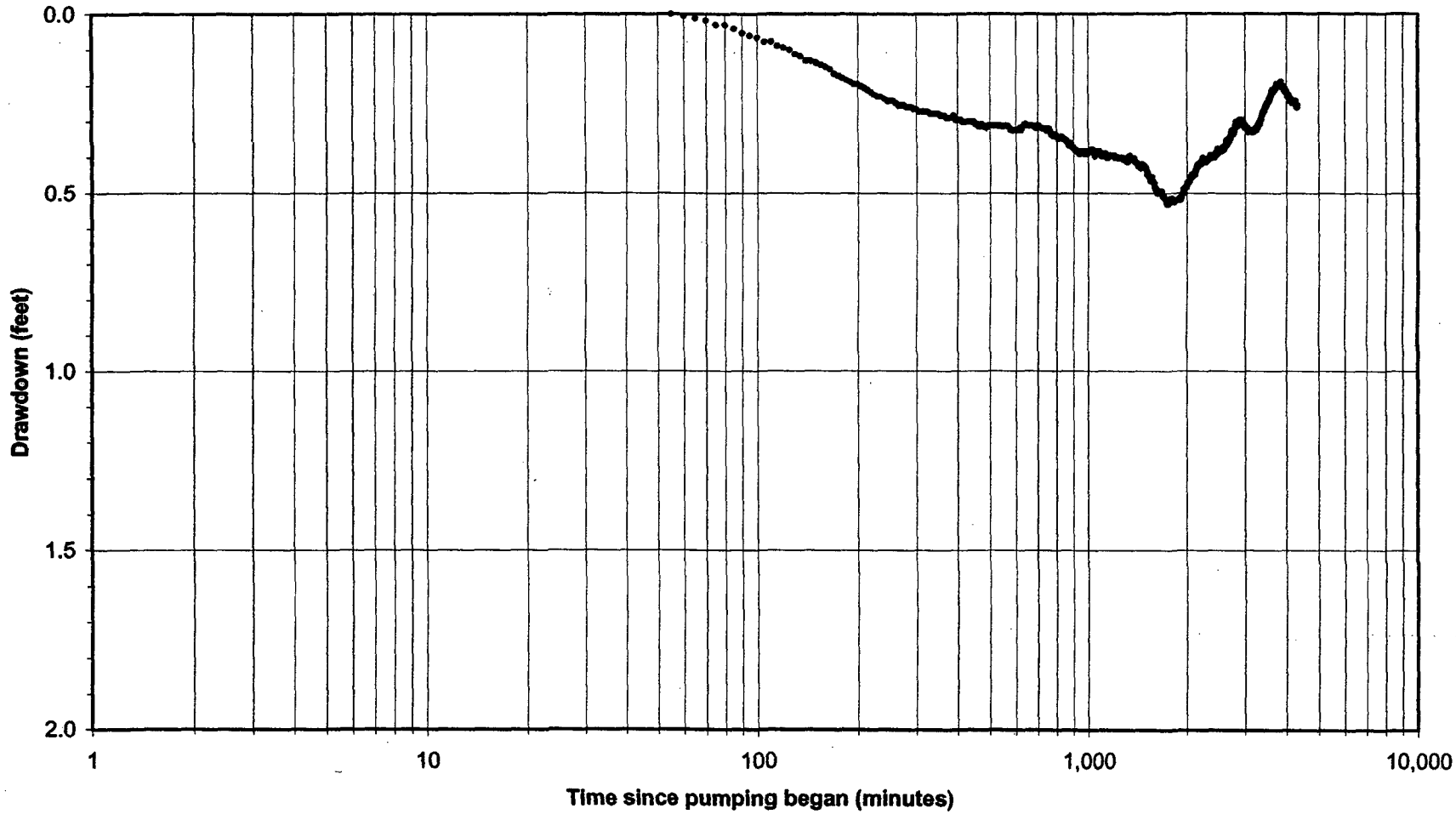

TW-4AD 72-Hour Constant-rate Pumping Test #2
Observation Well TW-4
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
249.50
249.30
249.10
248.90
248.70
248.50
248.30
248.10
247.90
247.70
247.50
Start of TW-3 pumping test
Start of TW-4AD pumping test
End of TW-3 pumping test
End of TW-4AD pumping test
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
5/30/2003 0:00
5/31/2003 0:00
6/1/2003 0:00
6/2/2003 0:00
6/3/2003 0:00
6/4/2003 0:00
6/5/2003 0:00
6/6/2003 0:00
6/7/2003 0:00
6/8/2003 0:00
6/9/2003 0:00
6/10/2003 0:00
6/11/2003 0:00
6/12/2003 0:00
Date

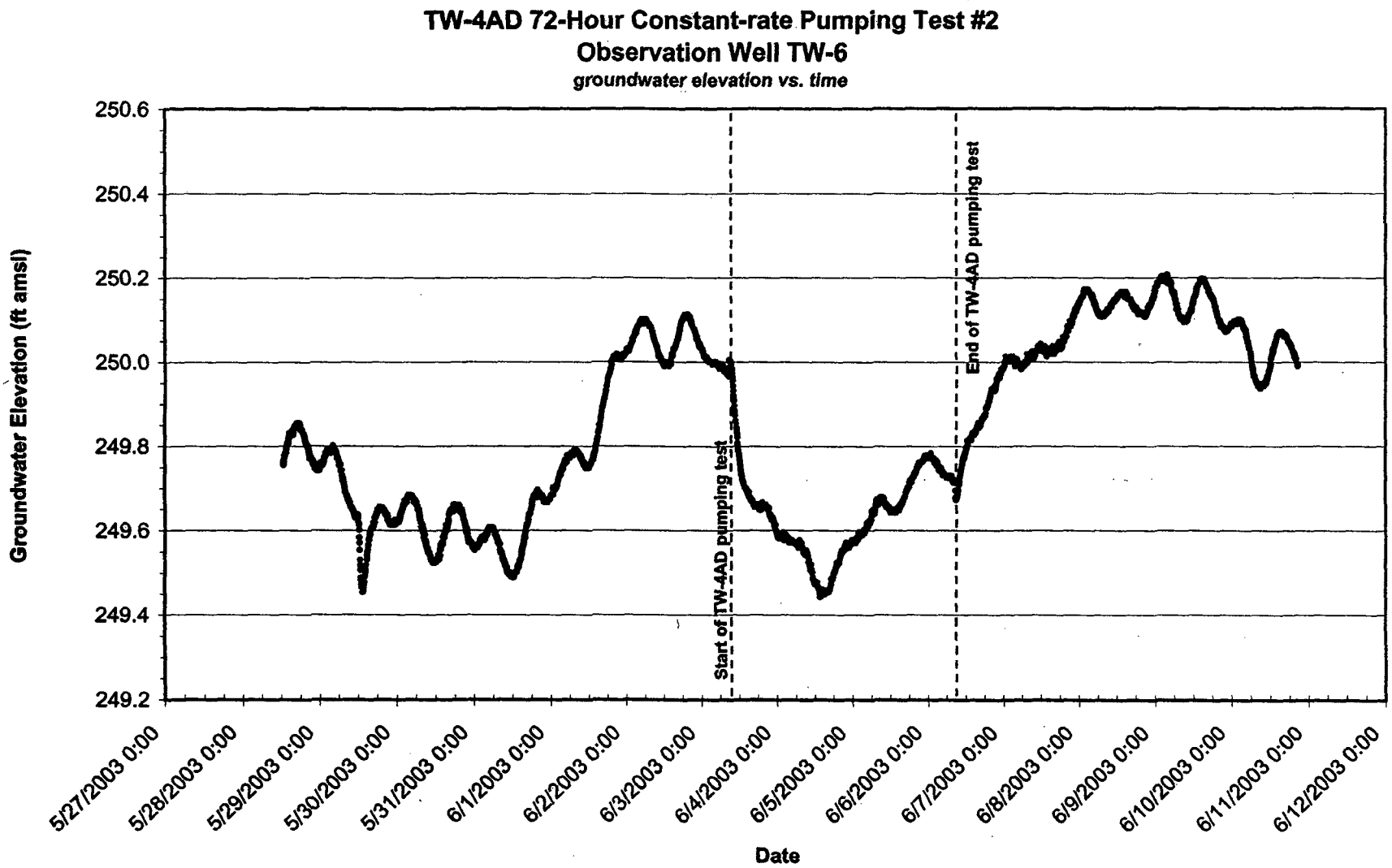
TW-4AD 72-Hour Constant-rate Pumping Test #2
Observation Well TW-4A
time vs. drawdown



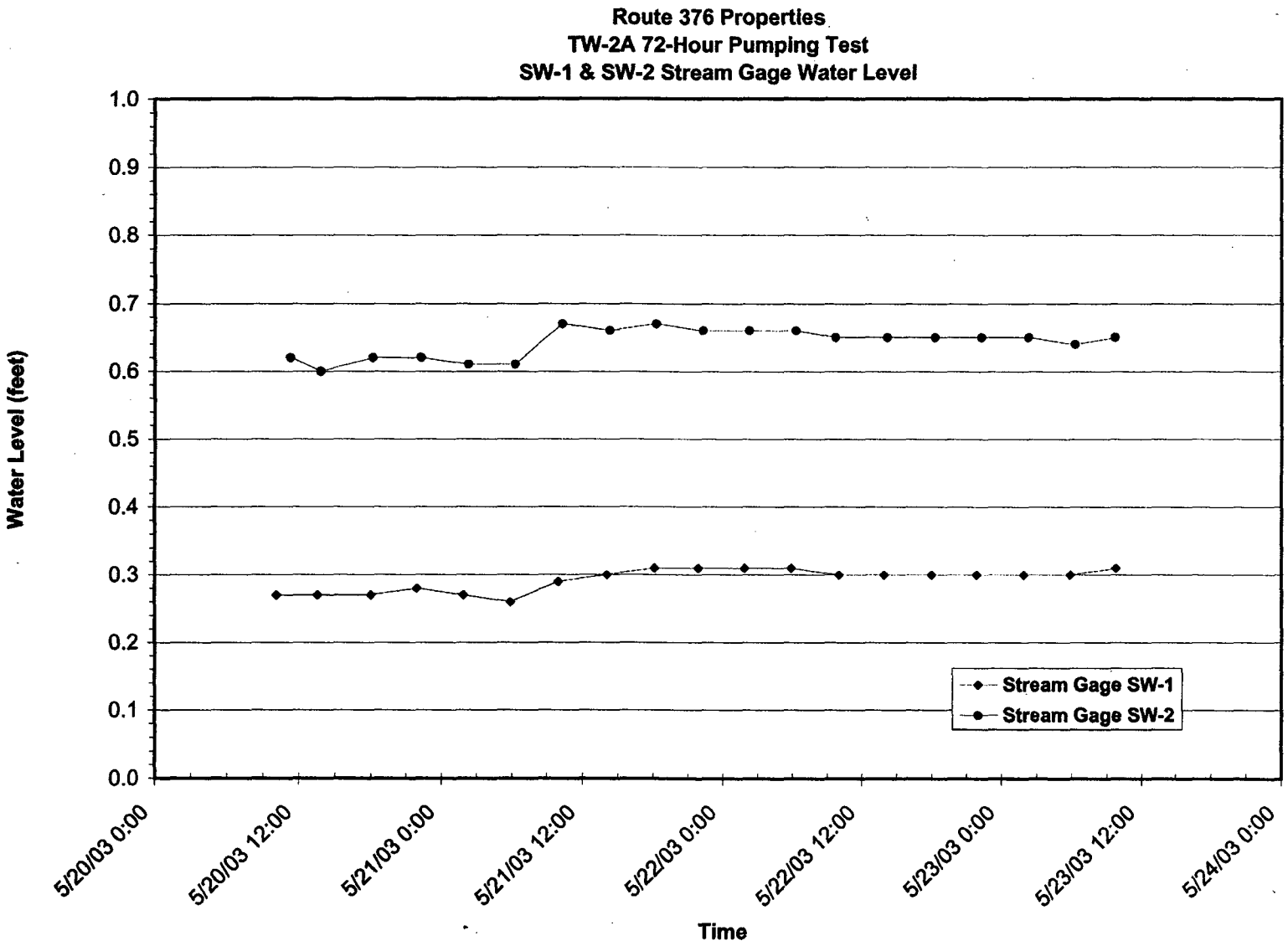

TW-4AD 72-Hour Constant-rate Pumping Test #2
Observation Well TW-4A
groundwter elevation vs. time
Groundwater elevation (ft amsl)
252.0
250.0
248.0
246.0
244.0
242.0
240.0
238.0
236.0
234.0
232.0
Start of TW-4AD pumping test
End of TW-4AD pumping test
6/2/2003 0:00
6/3/2003 0:00
6/4/2003 0:00
6/5/2003 0:00
6/6/2003 0:00
6/7/2003 0:00
6/8/2003 0:00
6/9/2003 0:00
6/10/2003 0:00
6/11/2003 0:00
6/12/2003 0:00
Date

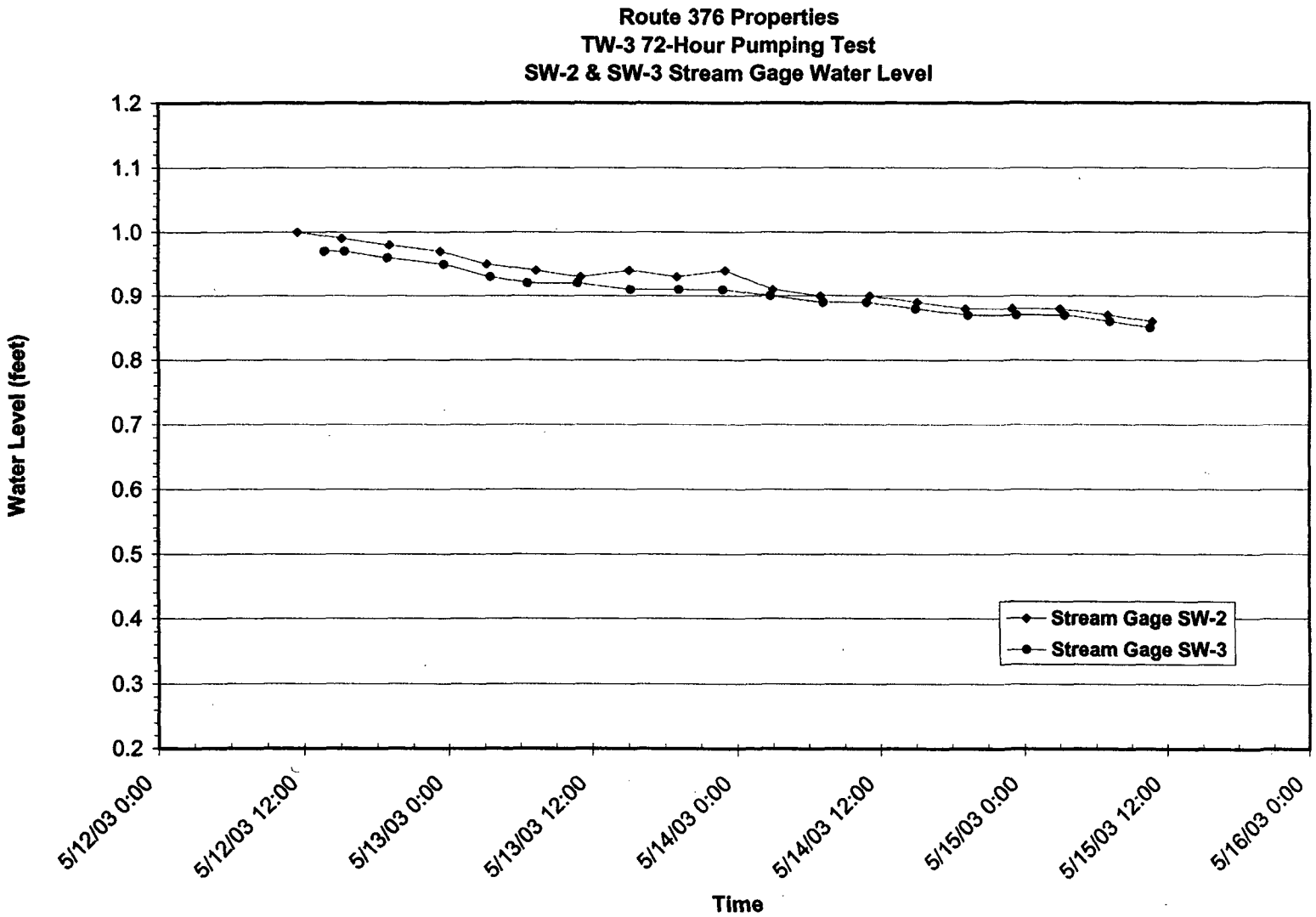
TW-4AD 72-Hour Constant-rate Pumping Test #2
Observation Well TW-6
time vs. drawdown

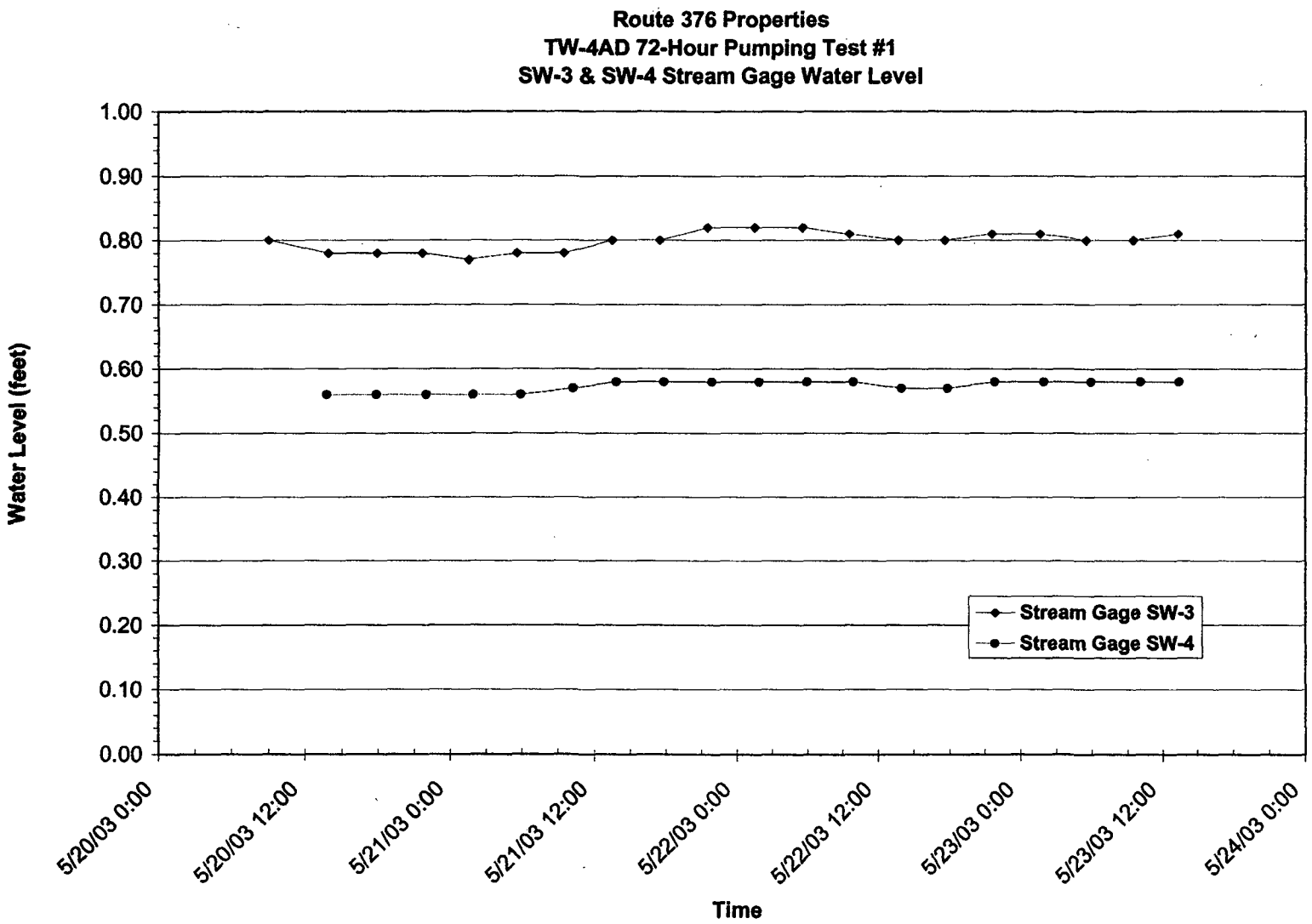


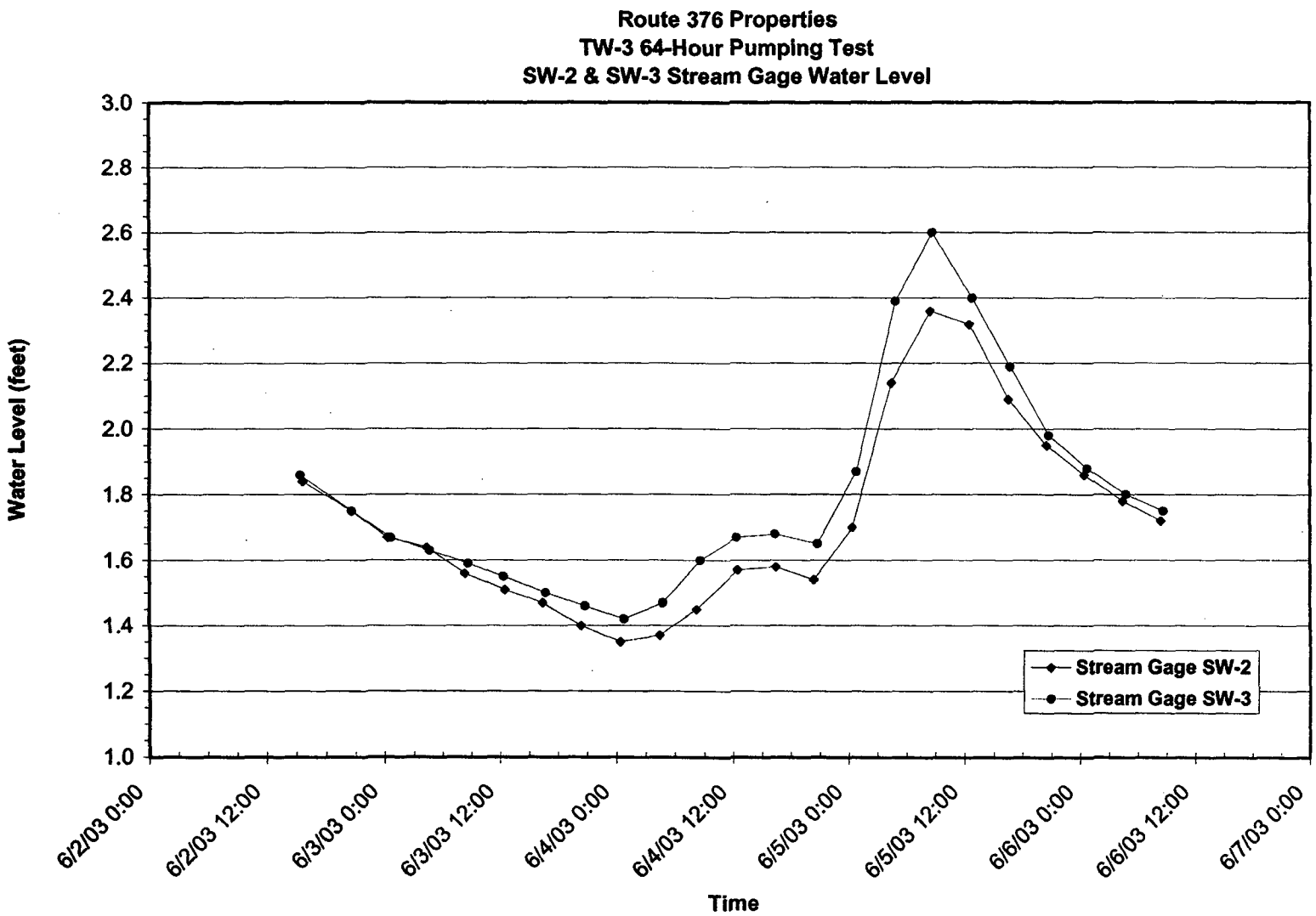

TW-4AD 72-Hour Constant-rate Pumping Test #2
Observation Well TW-6
groundwater elevation vs. time
Groundwater Elevation (ft amsl)
250.6
250.4
250.2
250.0
249.8
249.6
249.4
249.2
Start of TW-4AD pumping test
End of TW-4AD pumping test
5/27/2003 0:00
5/28/2003 0:00
5/29/2003 0:00
5/30/2003 0:00
5/31/2003 0:00
6/1/2003 0:00
6/2/2003 0:00
6/3/2003 0:00
6/4/2003 0:00
6/5/2003 0:00
6/6/2003 0:00
6/7/2003 0:00
6/8/2003 0:00
6/9/2003 0:00
6/10/2003 0:00
6/11/2003 0:00
6/12/2003 0:00
Date

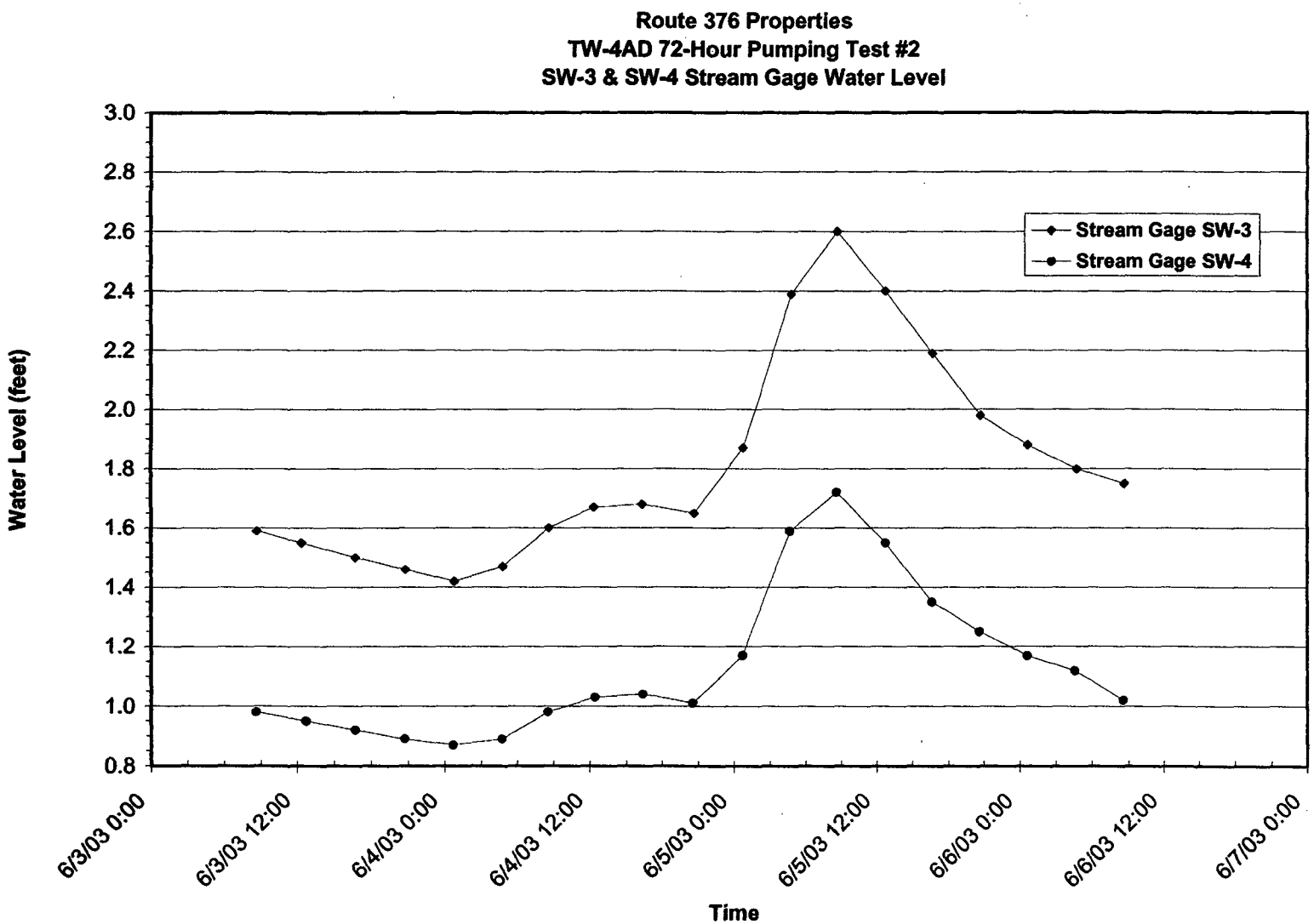
Stream Gage Data


Route 376 Properties
TW-2A 72-Hour Pumping Test
SW-1 & SW-2 Stream Gage Water Level
Water Level (feet)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
5/20/03 0:00
5/20/03 12:00
5/21/03 0:00
5/21/03 12:00
5/22/03 0:00
5/22/03 12:00
5/23/03 0:00
5/23/03 12:00
5/24/03 0:00
Time
Stream Gage SW-1
Stream Gage SW-2


Route 376 Properties
TW-3 72-Hour Pumping Test
SW-2 & SW-3 Stream Gage Water Level
Water Level (feet)
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
5/12/03 0:00
5/12/03 12:00
5/13/03 0:00
5/13/03 12:00
5/14/03 0:00
5/14/03 12:00
5/15/03 0:00
5/15/03 12:00
5/16/03 0:00
Time
Stream Gage SW-2
Stream Gage SW-3


Route 376 Properties
TW-4AD 72-Hour Pumping Test #1
SW-3 & SW-4 Stream Gage Water Level
Water Level (feet)
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
5/20/03 0:00
5/20/03 12:00
5/21/03 0:00
5/21/03 12:00
5/22/03 0:00
5/22/03 12:00
5/23/03 0:00
5/23/03 12:00
5/24/03 0:00
Time
Stream Gage SW-3
Stream Gage SW-4


Route 376 Properties
TW-3 64-Hour Pumping Test
SW-2 & SW-3 Stream Gage Water Level
Water Level (feet)
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
6/2/03 0:00
6/2/03 12:00
6/3/03 0:00
6/3/03 12:00
6/4/03 0:00
6/4/03 12:00
6/5/03 0:00
6/5/03 12:00
6/6/03 0:00
6/6/03 12:00
6/7/03 0:00
Time
Stream Gage SW-2
Stream Gage SW-3


Route 376 Properties
TW-4AD 72-Hour Pumping Test #2
SW-3 & SW-4 Stream Gage Water Level
Water Level (feet)
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
Stream Gage SW-3
Stream Gage SW-4
6/3/03 0:00
6/3/03 12:00
6/4/03 0:00
6/4/03 12:00
6/5/03 0:00
6/5/03 12:00
6/6/03 0:00
6/6/03 12:00
6/7/03 0:00
Time

APPENDIX C-2

Water Quality Data: Laboratory and Field

Groundwater Analytical Data

Sample ID		SPTW0230522G	SRTW0330515	SPTW0430522G
Location		TW-2A	TW-3	TW-4AD
Collection Date		05/22/2003	05/15/2003	05/22/2003
Endothall	ug/l	<9.0	<9.0	<9.0
Radon	pCi/l	600(+-30)	170(+-20)	210(+-20)
Asbestos	million fiber/l	<0.177	<0.177	<0.177
Hexachlorocyclopentadiene	ug/l	<0.6	<0.6	<0.6
Propachlor	ug/l	<1	<1	<1
Hexachlorobenzene	ug/l	<0.3	<0.3	<0.3
Simazine	ug/l	<0.5	<0.5	<0.5
Atrazine	ug/l	<0.5	<0.5	<0.5
Metribuzin	ug/l	<0.5	<0.5	<0.5
Alachlor	ug/l	<1	<1	<1
Metolachlor	ug/l	<1	<1	<1
Butachlor	ug/l	<1	<1	<1
bis (2-Ethylhexyl) adipate	ug/l	<1	<1	<1
Bis (2-ethylhexyl) phthalate	ug/l	1 BJ	0.4 BJ	0.6 BJ
Benzo (a) pyrene	ug/l	<0.1	<0.1	<0.1
Aldrin	ug/l	<0.03	<0.03	<0.03
Lindane	ug/l	<0.03	<0.03	<0.03
Heptachlor	ug/l	<0.03	<0.03	<0.03
Chlordane	ug/l	<0.5	<0.5	<0.5
Heptachlor epoxide	ug/l	<0.03	<0.03	<0.03
Total PCBs	ug/l	<0.5	<0.5	<0.5
Dieldrin	ug/l	<0.05	<0.05	<0.05
Endrin	ug/l	<0.05	<0.05	<0.05
Methoxychlor	ug/l	<0.03	<0.03	<0.03
Toxaphene	ug/l	<3	<3	<3
Aldicarb sulfoxide	ug/l	<1	<1	<1
Aldicarb sulfone	ug/l	<1	<1	<1
Oxamyl	ug/l	<1	<1	<1
Methomyl	ug/l	<1	<1	<1
3--Hydroxycarbofuran	ug/l	<1	<1	<1
Aldicarb	ug/l	<1	<1	<1
Carbofuran	ug/l	<1	<1	<1
Carbaryl	ug/l	<1	<1	<1
Glyphosate	ug/l	<10	<10	<10
Dalapon	ug/l	<1.0	<1.0	<1.0
Dicamba	ug/l	<0.080	<0.080	<0.080
2,4-D	ug/l	<0.25	<0.25	<0.25
Pentachlorophenol	ug/l	<0.20	<0.20	<0.20
2,4,5-TP (Silvex)	ug/l	<0.13	<0.13	<0.13
Dinoseb	ug/l	<0.20	<0.20	<0.20
Picloram	ug/l	<1.3	<1.3	<1.3
Diquat	ug/l	<1	<1	<1
Dichlorodifluoromethane	ug/l	<0.50	<0.50	<0.50
Chloromethane	ug/l	<0.50	<0.50	<0.50
Vinyl chloride	ug/l	<0.50	<0.50	<0.50
Bromomethane	ug/l	<0.50	<0.50	<0.50
Chloroethane	ug/l	<0.50	<0.50	<0.50
Trichlorofluoromethane	ug/l	<0.50	<0.50	<0.50
1,1-Dichloroethene	ug/l	<0.50	<0.50	<0.50
Methylene chloride	ug/l	<1.0	<1.0	0.54 J
trans-1,2-Dichloroethene	ug/l	<0.50	<0.50	<0.50
Methyl-tert-butyl-ether (MTBE)	ug/l	<0.50	<0.50	<0.50

1,1-Dichloroethane	ug/l	<0.50	<0.50	<0.50
2,2-Dichloropropane	ug/l	<0.50	<0.50	<0.50
cis-1,2-Dichloroethene	ug/l	<0.50	<0.50	<0.50
Bromochloromethane	ug/l	<0.50	<0.50	<0.50
Chloroform	ug/l	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	ug/l	<0.50	<0.50	<0.50
1,1-Dichloropropene	ug/l	<0.50	<0.50	<0.50
Carbon tetrachloride	ug/l	<0.50	<0.50	<0.50
Benzene	ug/l	<0.50	<0.50	<0.50
1,2-Dichloroethane	ug/l	<0.50	<0.50	<0.50
Trichloroethene	ug/l	<0.50	<0.50	<0.50
1,2-Dichloropropane	ug/l	<0.50	<0.50	<0.50
Dibromomethane	ug/l	<0.50	<0.50	<0.50
Bromodichloromethane	ug/l	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	ug/l	<0.50	<0.50	<0.50
Toluene	ug/l	<0.50	<0.50	<0.50
trans-1,3-Dichloropropene	ug/l	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	ug/l	<0.50	<0.50	<0.50
Tetrachloroethene	ug/l	<0.50	<0.50	<0.50
1,3-Dichloropropane	ug/l	<0.50	<0.50	<0.50
Dibromochloromethane	ug/l	<0.50	<0.50	<0.50
1,2-Dibromoethane (EDB)	ug/l	<0.50	<0.50	<0.50
Chlorobenzene	ug/l	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	ug/l	<0.50	<0.50	<0.50
Ethylbenzene	ug/l	<0.50	<0.50	<0.50
m&p-Xlyenes	ug/l	<0.50	<0.50	<0.50
o-Xylene	ug/l	<0.50	<0.50	<0.50
Styrene	ug/l	<0.50	<0.50	<0.50
Bromoform	ug/l	<0.50	<0.50	<0.50
Isopropylbenzene	ug/l	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	ug/l	<0.50	<0.50	<0.50
Bromobenzene	ug/l	<0.50	<0.50	<0.50
1,2,3-Trichloropropane	ug/l	<0.50	<0.50	<0.50
n-Propylbenzene	ug/l	<0.50	<0.50	<0.50
2--Chlorotoluene	ug/l	<0.50	<0.50	<0.50
1,3,5-Trimethylbenzene	ug/l	<0.50	<0.50	<0.50
4--Chlorotoluene	ug/l	<0.50	<0.50	<0.50
tert-Butylbenzene	ug/l	<0.50	<0.50	<0.50
1,2,4-Trimethylbenzene	ug/l	<0.50	<0.50	<0.50
sec-Butylbenzene	ug/l	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	ug/l	<0.50	<0.50	<0.50
p-Isopropyltoluene	ug/l	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	ug/l	<0.50	<0.50	<0.50
n-Butlybenzene	ug/l	<0.50	<0.50	<0.50
1,2-Dichlorobenzene	ug/l	<0.50	<0.50	<0.50
1,2-Dibromo-3-chloropropane	ug/l	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	ug/l	<0.50	<0.50	<0.50
Hexachlorobutadiene	ug/l	<0.50	<0.50	<0.50
Naphthalene	ug/l	<0.50	<0.50	<0.50
1,2,3-Trichlorobenzene	ug/l	<0.50	<0.50	<0.50
tert-Butyl alcohol	ug/l	<5.0	<5.0	<5.0
1,2-Dibromoethane (EDB)	ug/l	<0.020	<0.020	<0.020
1,2-Dibromo-3-chloropropane	ug/l	<0.020	<0.020	<0.020
Antimony	ug/l	<1.3 W	<1.3 W	<1.3 W
Antimony, Diss.	ug/l	<1.3 W	NA	<1.3 W
Selenium	ug/l	<1.4	<1.4	<1.4
Selenium, Diss.	ug/l	<1.4	NA	<1.4
Mercury	ug/l	<0.20	<0.20	<0.20
Mercury, Diss.	ug/l	<0.20	NA	<0.20
Thallium	ug/l	<1.6	<1.6	<1.6
Thallium, Diss.	ug/l	<1.6	NA	<1.6 W
Arsenic	ug/l	<2.4	<2.4	<2.4
Arsenic, Diss.	ug/l	<2.4	NA	<2.4

Barium	ug/l	26.2 B	120 B	141 B
Barium, Diss.	ug/l	26.4 B	NA	151 B
Beryllium	ug/l	<0.20	<0.20	<0.20
Beryllium, Diss.	ug/l	<0.20	NA	<0.20
Cadmium	ug/l	<0.30	<0.30	<0.30
Cadmium, Diss.	ug/l	<0.30	NA	<0.30
Chromium	ug/l	4.7 B	3.1 B	3.2 B
Chromium, Diss.	ug/l	4.8 B	NA	4.1 B
Iron	ug/l	<47.0	<47.0	<47.0
Iron, Diss.	ug/l	<47.0	NA	<47.0
Manganese	ug/l	<0.60	537	636
Manganese, Diss.	ug/l	<0.60	NA	681
Nickel	ug/l	<1.2	<1.2	<1.2
Nickel, Diss.	ug/l	<1.2	NA	1.2 B
Silver	ug/l	<1.8	<1.8	<1.8
Silver, Diss.	ug/l	<1.8	NA	<1.8
Sodium	ug/l	91500 E	8010 E	5260 E
Sodium, Diss.	ug/l	92100 E	NA	5430 E
Zinc	ug/l	19.2 B	15.2 B	6.3 B
Zinc, Diss.	ug/l	24.8	NA	<2.9
E. Coliform	MPN/100ml	<1.00	<1.00	<1.00
Total Coliform	MPN/100ml	<1.00	<1.00	<1.00
Color	Pt/Co	5.0	15	5.0
Odor	T.O.N.	1	1	1
Chloride	mg/l	184	21.5	14.1
Cyanide, Total	mg/l	<0.0100	<0.0100	<0.0100
Nitrite as N (NO2-N)	mg/l	<0.01	<0.01	<0.01
Fluoride	mg/l	<1	<1	<0.500
Nitrate as N (NO3-N)	mg/l	4.25	<1	<0.500
Sulfate	mg/l	28.7	19.7	22.1
Gross Alpha	pCi/l	<0.8	7.1	2.8 J
Gross Beta	pCi/l	4.4	4.2	2.2 J
Radium (226)	pCi/l	<0.051	<0.085	0.18 J
Radium (228)	pCi/l	<0.16	<0.26	<0.41
2,3,7,8-TCDD	pg/l	<5.0	<5.0	<5.0
Diatoms	Observed	0	0	0
Algae	Observed	0	0	0
Insect Parts	Observed	0	0	0
Crustacean	Observed	0	0	0
Rotifers	Observed	0	0	0
Plant Debris	Observed	0	0	0
Coccidian Oocysts	Observed	0	0	0
Giardia	Observed	0	0	0

J = Compound detetected above the IDL but less than the CRDL
B = Compound found in the assocated blank (Organic data)
B = Compound detected above the IDL but less than the CRDL (Inorganic data)
E = Estimated value
NA = Not analyzed

Field Parameters

Sample ID		SPTW0230522G	SRTW0330515G	SPTW0430522G
Location		TW-2A	TW-3	TW-4AD
Collection Date		05/22/2003	05/15/2003	05/22/2003
pH	pH	7.94	7.81	7.31
Specific Conductance	umhos/cm	570	601	1260
Temperature	C	11.00	12.80	13.33
Turbidity	NTU	1.61	1.02	1.50

Additional Sampling

Sample ID		SPTW0330605G	SROTW230212G	SR004A30124G	SR003A30124G
Location		TW-3	TW-2A	TW-4A	TW-3A
Collection Date		06/05/2003	2/12/2003	1/24/2003	1/24/2003
Diatoms	Observed	0	NA	NA	NA
Algae	Observed	0	NA	NA	NA
Insect Parts	Observed	0	NA	NA	NA
Crustacean	Observed	0	NA	NA	NA
Rotifers	Observed	0	NA	NA	NA
Plant Debris	Observed	0	NA	NA	NA
Coccidian Oocysts	Observed	0	NA	NA	NA
Giardia	Observed	0	NA	NA	NA
Total Hardness as CaCO3	mg/l	NA	328	263	330
Calcium	ug/l	NA	80700	NA	NA
Iron	ug/l	NA	<5.0	NA	NA
Iron, Diss.	ug/l	NA	16.7 B	NA	NA
Manganese	ug/l	NA	<1.3	NA	NA
Manganese, Diss.	ug/l	NA	2.5 B	NA	NA
Sodium	ug/l	NA	78900	NA	NA
Fecal Coliform	col/100ml	NA	<1.0	NA	NA
E. Coliform	MPN/100ml	NA	<1.00	NA	NA
Total Coliform	MPN/100ml	NA	<1.00	NA	NA
Total Dissolved Solids	mg/l	NA	552	NA	NA
Total Suspended Solids	mg/l	NA	<4.00	NA	NA
Chloride	mg/l	NA	136	NA	NA
Sulfide	mg/l	NA	<0.10	NA	NA
Nitrate as N (NO3-N)	mg/l	NA	4.08	NA	NA
Sulfate	mg/l	NA	24.9	NA	NA

B = Compound found above the IDL but less than the CRDL
NA = Not analyzed

LABORATORY TEST RESULTS

Job Number: 221033 Date: 02/21/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SROTW230212G
Date Sampled.....: 02/12/2003
Time Sampled.....: 10:20
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 221033-1
Date Received.....: 02/12/2003
Time Received.....: 12:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
SW846 5030(5mL	Sample Preparation	Complete				Text	02/14/03	pcp
EPA 524.2	Volatile Organics							
	Dichlorodifluoromethane	0.50	U		0.50	ug/L	02/13/03	pcp
	Chloromethane	0.50	U		0.50	ug/L	02/13/03	pcp
	Vinyl chloride	0.50	U		0.50	ug/L	02/13/03	pcp
	Bromomethane	0.50	U		0.50	ug/L	02/13/03	pcp
	Chloroethane	0.50	U		0.50	ug/L	02/13/03	pcp
	Trichlorofluoromethane	0.50	U		0.50	ug/L	02/13/03	pcp
	1,1-Dichloroethene	0.50	U		0.50	ug/L	02/13/03	pcp
	Methylene chloride	1.0	U		1.0	ug/L	02/13/03	pcp
	trans-1,2-Dichloroethene	0.50	U		0.50	ug/L	02/13/03	pcp
	Methyl-tert-butyl-ether (MTBE)	0.50	U		0.50	ug/L	02/13/03	pcp
	1,1-Dichloroethane	0.50	U		0.50	ug/L	02/13/03	pcp
	2,2-Dichloropropane	0.50	U		0.50	ug/L	02/13/03	pcp
	cis-1,2-Dichloroethene	0.50	U		0.50	ug/L	02/13/03	pcp
	Bromochloromethane	0.50	U		0.50	ug/L	02/13/03	pcp
	Chloroform	0.50	U		0.50	ug/L	02/13/03	pcp
	1,1,1-Trichloroethane	0.50	U		0.50	ug/L	02/13/03	pcp
	1,1-Dichloropropene	0.50	U		0.50	ug/L	02/13/03	pcp
	Carbon tetrachloride	0.50	U		0.50	ug/L	02/13/03	pcp
	Benzene	0.50	U		0.50	ug/L	02/13/03	pcp
	1,2-Dichloroethane	0.50	U		0.50	ug/L	02/13/03	pcp
	Trichloroethene	0.50	U		0.50	ug/L	02/13/03	pcp
	1,2-Dichloropropane	0.50	U		0.50	ug/L	02/13/03	pcp
	Dibromomethane	0.50	U		0.50	ug/L	02/13/03	pcp
	Bromodichloromethane	0.50	U		0.50	ug/L	02/13/03	pcp
	cis-1,3-Dichloropropene	0.50	U		0.50	ug/L	02/13/03	pcp
	Toluene	0.50	U		0.50	ug/L	02/13/03	pcp
	trans-1,3-Dichloropropene	0.50	U		0.50	ug/L	02/13/03	pcp
	1,1,2-Trichloroethane	0.50	U		0.50	ug/L	02/13/03	pcp
	Tetrachloroethene	0.50	U		0.50	ug/L	02/13/03	pcp
	1,3-Dichloropropane	0.50	U		0.50	ug/L	02/13/03	pcp
	Dibromochloromethane	0.50	U		0.50	ug/L	02/13/03	pcp
	1,2-Dibromoethane (EDB)	0.50	U		0.50	ug/L	02/13/03	pcp
	Chlorobenzene	0.50	U		0.50	ug/L	02/13/03	pcp
	1,1,1,2-Tetrachloroethane	0.50	U		0.50	ug/L	02/13/03	pcp
	Ethylbenzene	0.50	U		0.50	ug/L	02/13/03	pcp
	m&p-Xylenes	0.50	U		0.50	ug/L	02/13/03	pcp
	o-Xylene	0.50	U		0.50	ug/L	02/13/03	pcp
	Styrene	0.50	U		0.50	ug/L	02/13/03	pcp
	Bromoform	0.50	U		0.50	ug/L	02/13/03	pcp
	Isopropylbenzene	0.50	U		0.50	ug/L	02/13/03	pcp
	1,1,2,2-Tetrachloroethane	0.50	U		0.50	ug/L	02/13/03	pcp
	Bromobenzene	0.50	U		0.50	ug/L	02/13/03	pcp
	1,2,3-Trichloropropane	0.50	U		0.50	ug/L	02/13/03	pcp
	n-Propylbenzene	0.50	U		0.50	ug/L	02/13/03	pcp
	2-Chlorotoluene	0.50	U		0.50	ug/L	02/13/03	pcp

* In Description = Dry Wgt.

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SEVERN TRENT STL
NYSDOH 10142 NJDEP 73015 CTDOHS PH-0554 EPA NY049 PA 68-376 M-NY049
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315 Fullerton Avenue
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Fax (845) 562-0841

LABORATORY TEST RESULTS

Job Number: 221033 Date: 02/21/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SROTW230212G
Date Sampled.....: 02/12/2003
Time Sampled.....: 10:20
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 221033-1
Date Received.....: 02/12/2003
Time Received.....: 12:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
	1,3,5-Trimethylbenzene	0.50	U		0.50	ug/L	02/13/03	pcp
	4-Chlorotoluene	0.50	U		0.50	ug/L	02/13/03	pcp
	tert-Butylbenzene	0.50	U		0.50	ug/L	02/13/03	pcp
	1,2,4-Trimethylbenzene	0.50	U		0.50	ug/L	02/13/03	pcp
	sec-Butylbenzene	0.50	U		0.50	ug/L	02/13/03	pcp
	1,3-Dichlorobenzene	0.50	U		0.50	ug/L	02/13/03	pcp
	p-Isopropyltoluene	0.50	U		0.50	ug/L	02/13/03	pcp
	1,4-Dichlorobenzene	0.50	U		0.50	ug/L	02/13/03	pcp
	n-Butylbenzene	0.50	U		0.50	ug/L	02/13/03	pcp
	1,2-Dichlorobenzene	0.50	U		0.50	ug/L	02/13/03	pcp
	1,2-Dibromo-3-chloropropane	0.50	U		0.50	ug/L	02/13/03	pcp
	1,2,4-Trichlorobenzene	0.50	U		0.50	ug/L	02/13/03	pcp
	Hexachlorobutadiene	0.50	U		0.50	ug/L	02/13/03	pcp
	Naphthalene	0.50	U		0.50	ug/L	02/13/03	pcp
	1,2,3-Trichlorobenzene	0.50	U		0.50	ug/L	02/13/03	pcp

* In Description = Dry Wgt.

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315 Fullerton Avenue
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Fax (845) 562-0841

LABORATORY TEST RESULTS

Job Number: 221033 Date:02/21/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SROTW230212G
Date Sampled.....: 02/12/2003
Time Sampled.....: 10:20
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 221033-1
Date Received.....: 02/12/2003
Time Received.....: 12:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	IDL	RL	DILUTION	UNITS	DT	DATE	TECH
EPA 200.7	Hardness by calculation	328				2.50	1	mg/L		02/20/03	mad
	Hardness, Total as CaCO3										
EPA 200.7	Metals Analysis (ICP)	80700			59.1	500	1	ug/L		02/20/03	mad
	Calcium (Ca)	5.0	U		5.0	60.0	1	ug/L		02/20/03	mad
	Iron (Fe)	16.7	B		5.0	60.0	1	ug/L		02/20/03	mad
	Iron (Fe), Diss.	1.3	U		1.3	10.0	1	ug/L		02/20/03	mad
	Manganese (Mn)	2.5	B		1.3	10.0	1	ug/L		02/20/03	mad
	Manganese (Mn), Diss.	78900			212	200	1	ug/L		02/20/03	mad
	Sodium (Na)										

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 221033 Date: 02/21/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SROTW230212G
Date Sampled.....: 02/12/2003
Time Sampled.....: 10:20
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 221033-1
Date Received.....: 02/12/2003
Time Received.....: 12:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TEC
SM18 9222D	Coliform, Fecal	1.0	U		1.0	col/100ml	02/12/03	man
SM18 9223	E. Coliform Count	1.00	U		1.00	MPN/100ml	02/12/03	man
SM18 9223	Total Coliform Count	1.00	U		1.00	MPN/100ml	02/12/03	mam
EPA 160.1	Solids, Total Dissolved (TDS)	552			5.0	mg/L	02/19/03	lms
EPA 160.2	Solids, Total Suspended (TSS)	4.00	U		4.00	mg/L	02/13/03	pjs
SM18 4500Cl	Chloride	136			25	mg/L	02/18/03	mam
SM18 4500SD	Sulfide	0.10	U		0.10	mg/L	02/18/03	nmd
EPA 300.0	Ion Chromatography Analysis							
	Nitrate as N (NO3-N)	4.08			0.500	mg/L	02/13/03	bg
	Sulfate	24.9			5.00	mg/L	02/13/03	bg

* In Description = Dry Wgt.

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STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
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Fax (845) 562-0841

LABORATORY TEST RESULTS

Job Number: 224327 Date: 06/13/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SPTW0230522G
Date Sampled.....: 05/22/2003
Time Sampled.....: 14:05
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 224327-1
Date Received.....: 05/22/2003
Time Received.....: 17:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
SW846 5030(5mL	Sample Preparation	Complete				Text	05/30/03	pcp
EPA 524.2	Volatile Organics							
	Dichlorodifluoromethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Chloromethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Vinyl chloride	0.50	U		0.50	ug/L	05/24/03	pcp
	Bromomethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Chloroethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Trichlorofluoromethane	0.50	U		0.50	ug/L	05/24/03	pcp
	1,1-Dichloroethene	0.50	U		0.50	ug/L	05/24/03	pcp
	Methylene chloride	1.0	U		1.0	ug/L	05/24/03	pcp
	trans-1,2-Dichloroethene	0.50	U		0.50	ug/L	05/24/03	pcp
	Methyl-tert-butyl-ether (MTBE)	0.50	U		0.50	ug/L	05/24/03	pcp
	1,1-Dichloroethane	0.50	U		0.50	ug/L	05/24/03	pcp
	2,2-Dichloropropane	0.50	U		0.50	ug/L	05/24/03	pcp
	cis-1,2-Dichloroethene	0.50	U		0.50	ug/L	05/24/03	pcp
	Bromochloromethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Chloroform	0.50	U		0.50	ug/L	05/24/03	pcp
	1,1,1-Trichloroethane	0.50	U		0.50	ug/L	05/24/03	pcp
	1,1-Dichloropropene	0.50	U		0.50	ug/L	05/24/03	pcp
	Carbon tetrachloride	0.50	U		0.50	ug/L	05/24/03	pcp
	Benzene	0.50	U		0.50	ug/L	05/24/03	pcp
	1,2-Dichloroethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Trichloroethene	0.50	U		0.50	ug/L	05/24/03	pcp
	1,2-Dichloropropane	0.50	U		0.50	ug/L	05/24/03	pcp
	Dibromomethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Bromodichloromethane	0.50	U		0.50	ug/L	05/24/03	pcp
	cis-1,3-Dichloropropene	0.50	U		0.50	ug/L	05/24/03	pcp
	Toluene	0.50	U		0.50	ug/L	05/24/03	pcp
	trans-1,3-Dichloropropene	0.50	U		0.50	ug/L	05/24/03	pcp
	1,1,2-Trichloroethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Tetrachloroethene	0.50	U		0.50	ug/L	05/24/03	pcp
	1,3-Dichloropropane	0.50	U		0.50	ug/L	05/24/03	pcp
	Dibromochloromethane	0.50	U		0.50	ug/L	05/24/03	pcp
	1,2-Dibromoethane (EDB)	0.50	U		0.50	ug/L	05/24/03	pcp
	Chlorobenzene	0.50	U		0.50	ug/L	05/24/03	pcp
	1,1,1,2-Tetrachloroethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Ethylbenzene	0.50	U		0.50	ug/L	05/24/03	pcp
	m&p-Xylenes	0.50	U		0.50	ug/L	05/24/03	pcp
	o-Xylene	0.50	U		0.50	ug/L	05/24/03	pcp
	Styrene	0.50	U		0.50	ug/L	05/24/03	pcp
	Bromoform	0.50	U		0.50	ug/L	05/24/03	pcp
	Isopropylbenzene	0.50	U		0.50	ug/L	05/24/03	pcp
	1,1,2,2-Tetrachloroethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Bromobenzene	0.50	U		0.50	ug/L	05/24/03	pcp
	1,2,3-Trichloropropane	0.50	U		0.50	ug/L	05/24/03	pcp
	n-Propylbenzene	0.50	U		0.50	ug/L	05/24/03	pcp
	2-Chlorotoluene	0.50	U		0.50	ug/L	05/24/03	pcp

* In Description = Dry Wgt.

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SEVERN TRENT STL

000022

NYSDOH 10142 NJDEP 73015 CTDOHS PH-0564 EPA NY049 PA 68-378 M-NY049

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 562-0890

LABORATORY TEST RESULTS

Job Number: 224327 Date: 06/13/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SPTW0230522G
Date Sampled.....: 05/22/2003
Time Sampled.....: 14:05
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 224327-1
Date Received.....: 05/22/2003
Time Received.....: 17:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TE
	1,3,5-Trimethylbenzene	0.50	U		0.50	ug/L	05/24/03	pc
	4-Chlorotoluene	0.50	U		0.50	ug/L	05/24/03	pc
	tert-Butylbenzene	0.50	U		0.50	ug/L	05/24/03	pc
	1,2,4-Trimethylbenzene	0.50	U		0.50	ug/L	05/24/03	pc
	sec-Butylbenzene	0.50	U		0.50	ug/L	05/24/03	pc
	1,3-Dichlorobenzene	0.50	U		0.50	ug/L	05/24/03	pc
	p-Isopropyltoluene	0.50	U		0.50	ug/L	05/24/03	pc
	1,4-Dichlorobenzene	0.50	U		0.50	ug/L	05/24/03	pc
	n-Butylbenzene	0.50	U		0.50	ug/L	05/24/03	pc
	1,2-Dichlorobenzene	0.50	U		0.50	ug/L	05/24/03	pc
	1,2-Dibromo-3-chloropropane	0.50	U		0.50	ug/L	05/24/03	pc
	1,2,4-Trichlorobenzene	0.50	U		0.50	ug/L	05/24/03	pc
	Hexachlorobutadiene	0.50	U		0.50	ug/L	05/24/03	pc
	Naphthalene	0.50	U		0.50	ug/L	05/24/03	pc
	1,2,3-Trichlorobenzene	0.50	U		0.50	ug/L	05/24/03	pc
	tert-Butyl alcohol	~~5.0~~	~~U~~	R	5.0	ug/L	05/24/03	pc

07/15/03

* In Description = Dry Wgt.

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SEVERN TRENT STL

NYSDOH 10142 NJDEP 73015 CTDOHS PH-0564 EPA NY049

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550

LABORATORY TEST RESULTS

Job Number: 224327 Date: 06/02/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SPTW0230522G
Date Sampled.....: 05/22/2003
Time Sampled.....: 14:05
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 224327-1
Date Received.....: 05/22/2003
Time Received.....: 17:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
EPA 504	GC Micro-Extractable Volatiles							
	1,2-Dibromoethane (EDB)	0.020	U		0.020	ug/L	05/27/03	smo
	1,2-Dibromo-3-chloropropane	0.020	U		0.020	ug/L	05/27/03	smo

* In Description = Dry Wgt.

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000116

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NYSDOH 10142 NJDEP 73015 CTDOHS PH-0554 EPA NY049
STL Newburgh
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Tel (845) 562-0890

LABORATORY TEST RESULTS

Job Number: 224327 Date:06/26/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SPTW0230522G
Date Sampled.....: 05/22/2003
Time Sampled.....: 14:05
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 224327-1
Date Received.....: 05/22/2003
Time Received.....: 17:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	IDL	RL	DILUTION	UNITS	DT	DATE	TECH
SM18 3113B	Antimony (Sb)	1.3	~~U~~	MUJ	1.3	3.0	1	ug/L		06/04/03	mwh
SM18 3113B	Antimony (Sb), Diss.	1.3	~~U~~	MUJ	1.3	3.0	1	ug/L		06/04/03	mwh
SM18 3113B	Selenium (Se)	1.4	U		1.4	5.0	1	ug/L		06/02/03	mwh
SM18 3113B	Selenium (Se), Diss.	1.4	U		1.4	5.0	1	ug/L		06/02/03	mwh
EPA 245.1	Mercury (Hg)	0.20	U		0.20	0.20	1	ug/L		05/27/03	lms
EPA 245.1	Mercury (Hg), Diss.	0.20	U		0.20	0.20	1	ug/L		05/27/03	lms
EPA 200.9	Metals Analysis (GFAA)										
	Thallium (Tl)	1.6	U		1.6	1.5	1	ug/L		05/28/03	mwh
	Thallium (Tl), Diss.	1.6	U		1.6	1.5	1	ug/L		05/28/03	mwh
EPA 200.7	Metals Analysis (ICP)										
	Arsenic (As)	2.4	U		2.4	5.0	1	ug/L		06/06/03	mad
	Arsenic (As), Diss.	2.4	U		2.4	10.0	1	ug/L		06/06/03	mad
	Barium (Ba)	26.2	~~B~~		4.7	150	1	ug/L		06/04/03	mad
	Barium (Ba), Diss.	26.4	~~B~~		4.7	200	1	ug/L		06/04/03	mad
	Beryllium (Be)	0.20	~~U~~	UJ	0.20	1.0	1	ug/L		06/04/03	mad
	Beryllium (Be), Diss.	0.20	~~U~~	UJ	0.20	5.0	1	ug/L		06/04/03	mad
	Cadmium (Cd)	0.30	~~U~~	UJ	0.30	2.0	1	ug/L		06/04/03	mad
	Cadmium (Cd), Diss.	0.30	~~U~~	UJ	0.30	5.0	1	ug/L		06/04/03	mad
	Chromium (Cr)	4.7	~~B~~	J	0.70	10.0	1	ug/L		06/04/03	mad
	Chromium (Cr), Diss.	4.8	~~B~~	J	0.70	10.0	1	ug/L		06/04/03	mad
	Iron (Fe)	47.0	U		47.0	60.0	1	ug/L		06/04/03	mad

CAJ Jackson 7/22/03

* In Description = Dry Wgt.

000153

LABORATORY TEST RESULTS

Job Number: 224327 Date:06/26/2003

CUSTOMER: Groundwater Sciences PROJECT: 01103.10.0203 SHEM ATTN: Dorothy Bergmann

Customer Sample ID: SPTW0230522G
Date Sampled.....: 05/22/2003
Time Sampled.....: 14:05
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 224327-1
Date Received.....: 05/22/2003
Time Received.....: 17:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	IDL	RL	DILUTION	UNITS	QT	DATE	TECH
	Iron (Fe), Diss.	47.0	U		47.0	60.0	1	ug/L		06/04/03	mad
	Manganese (Mn)	0.60	M	UJ	0.60	10.0	1	ug/L		06/04/03	mad
	Manganese (Mn), Diss.	0.60	M	UJ	0.60	10.0	1	ug/L		06/04/03	mad
	Nickel (Ni)	1.2	M	UJ	1.2	10.0	1	ug/L		06/04/03	mad
	Nickel (Ni), Diss.	1.2	M	UJ	1.2	40.0	1	ug/L		06/04/03	mad
	Silver (Ag)	1.8	M	UJ	1.8	10.0	1	ug/L		06/04/03	mad
	Silver (Ag), Diss.	1.8	M	UJ	1.8	10.0	1	ug/L		06/04/03	mad
	Sodium (Na)	91500		E J	138	200	1	ug/L		06/04/03	mad
	Sodium (Na), Diss.	92100		E J	138	500	1	ug/L		06/04/03	mad
	Zinc (Zn)	19.2		J	2.9	20.0	1	ug/L		06/04/03	mad
	Zinc (Zn), Diss.	24.8		J	2.9	20.0	1	ug/L		06/04/03	mad

CA Erickson 7/22/03

* In Description = Dry Wgt.

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Environmental Health Laboratories
Sample Result Record Sheet

Sample Matrix: DW
Acquisition File: Not Available
Data Directory: 052703a
Instrument: GC/MS - T
Extracted Date: 05/27/2003
Sample Number: 890575
Dilution Factor: 10
Sample Site: 224327-1 SPTW0230522G
Sample Location: SPTW0230522G EED 7/18/03

Method: 548.1
Calibration File: m-548 1-t-042403.mth
Analysis Date: 05/27/2003
Analysis Time: 20:48
Analyst: werbians
Results Submitted By: werbians
Run Number: 54601

Sample Quality Control

Internal Standards Parameter	Area	CCC Area	CCC % Resp	CCC Area Limits Lwr	CCC Area Limits Upr	CCC Pass / Fail	IC Avg Area	IC % Resp	IC Area Limits Lwr	IC Area Limits Upr	IC Pass / Fail
IS-4,4'-Dibromooctafluorobiphenyl	86593	71874	120	70	130	PASS	Not Found	N/A	N/A	N/A	N/A

Surrogate Standards Parameter	Amount	Units	Target	%Rec	Limits Lower	Limits Upper	Pass/Fail
SS-2,4-Dichlorophenylacetic acid	396.037	ug/L	50	79	70	130	PASS

Ordered Parameter Results

Parameter	Amount	MRL	Units
Endothall	< 9.0	9.0	ug/L

Additional Found Parameters

Parameter	Amount	MRL	Units

The symbol * in the Amount column above indicates that the sample was re-analyzed for that parameter and the results are presented on another page.

SEVERN TRENT **STL**

Doug Tawse
STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550

June 6, 2003

Dear Doug:

Please find enclosed results for three (3) samples, Billing Ref: Shanandoah, STL Job #207275, which you submitted for asbestos analysis by Transmission Electron Microscopy (TEM).

The results are listed according to the NYELAP Certification Manual and USEPA Phase II Primary and Secondary Drinking Water Regulations EPA Method 100.2 ("<" is equal to the value of the detection limit).

CLIENT SAMPLE ID	A (million fibers/liter)	DATE FILTERED	DATE ANALYZED
224090-1	<0.177	05/16/03; 10:48	06/06/03; 14:20
224327-1 SPTW0230522G	<0.177	05/23/03; 11:11	06/06/03; 14:42
224327-2	<0.177	05/23/03; 11:17	06/06/03; 15:03

The final maximum contaminant level goal (MCLG) and maximum contaminant level (MCL) for asbestos in water is 7.0 Million fibers/liter.

STL Billerica is accredited by NYELAP (#10838) and the Commonwealth of Massachusetts (#M-MA038) for asbestos analysis of water samples

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted above.

Severn Trent Laboratories is not responsible for incorrect sampling procedures since these water samples were not collected by our lab personnel. STL is only responsible for the analysis and reporting of submitted samples. Accreditation in no way constitutes or implies product certification, approval, or endorsement by NELAC. This report relates only to the specific samples tested herein. The enclosed report shall not be reproduced except in full, without the written approval of STL.

Should you have further questions, or need additional information, please feel free to contact Client Services or me at any time.

Sincerely,

Ernest T. Dobi

Ernest T. Dobi, Ph.D.
Manager-Microscopy Service

Severn Trent Laboratories, Inc.
STL Billerica • 149 Rangeway Road, North Billerica, MA 01862
Tel 978 667 1400 Fax 978 667 7871 • *www.stl-inc.com*

A part of Severn Trent plc

Hazen Research, Inc.
4601 Indiana Street
Golden, CO 80403 USA
Tel: (303) 279-4501
Fax: (303) 278-1528

DATE	June 12, 2003
HRI PROJECT	002-DF3
HRI SERIES NO.	E460/03
DATE REC'D	05/23/2003
CUST. P.O.#	05-18

STL Newburgh
D. Tause
315 Fullerton Avenue
Newburgh, NY 12550

REPORT OF ANALYSIS

SAMPLE NO. E460/03-1

SAMPLE IDENTIFICATION: 224327-1 - SPTW0230522G - Shenandoah - sampled on 05/22/2003 @ 1405

PARAMETER	RESULT	DETECTION LIMIT	METHOD	ANALYSIS DATE	ANALYST
Radon (+-Precision*), pCi/l (T)	600(+-30)	14	SM 7500-Rn B	05/23/2003 @ 1540	MRA

*Variability of the radioactive decay process (counting error) at the 95% confidence level, 1.96 sigma.
Certification ID's: CO/EPA - CO00008; CT - PH-0152; KY - 90076; KS - E-10265; NH - 232801-A; NY ELAP - 11417; PA DEP 68551; WI - 998376610

CODES:
(T) = Total (D) = Dissolved
(S) = Suspended (R) = Total Recoverable
(PD) = Potentially Dissolved
< = Less Than

By: Robert Rostad
Laboratory Manager

An Employee-Owned Company

STL ST. LOUIS

STL NEWBURGH

Client Sample ID: 224327-1 SPTW0230522G

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F3E230213-002
Work Order: FPA2H
Matrix: WATER

Date Collected: 05/22/03 1405
Date Received: 05/23/03 0900

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
GROSS A/B BY GFPC EPA 900.0 MOD				pCi/L	900.0 MOD			
Gross Alpha	~~0.4~~ 5.4	U	3.0	5.4	06/16/03	06/19/03	3167313	
Gross Beta	4.4		2.5	3.8	06/16/03	06/19/03	3167313	
RA-226 BY EPA-903.0 MOD				pCi/L	903.0 MOD			
Radium (226)	~~0.051~~ 0.13	U	0.078	0.13	05/27/03	06/11/03	3147208	100
RA-228 BY GFPC EPA 904 MOD				pCi/L	904 MOD			
Radium 228	~~0.46~~ 0.65	U	0.39	0.65	05/27/03	06/11/03	3147209	97

DAS 7/21/03

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

U Result is less than the sample detection limit.

STL NEWBURGH

Client Sample ID: SPTW0230522G

Trace Level Organic Compounds

Lot-Sample #...: G3E230368-002 Work Order #...: FPC7J1AA Matrix.....: WATER
Date Sampled...: 05/22/03 Date Received..: 05/23/03
Prep Date.....: 05/31/03 Analysis Date..: 06/01/03
Prep Batch #...: 3151166
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	5.0	pg/L	EPA-5 1613B-Tetra

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	85	(25 - 141)

LABORATORY TEST RESULTS

Job Number: 224327 Date: 06/26/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SPTW0230522G
Date Sampled.....: 05/22/2003
Time Sampled.....: 14:05
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 224327-1
Date Received.....: 05/22/2003
Time Received.....: 17:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
SM18 9223	E. Coliform Count	1.00	U		1.00	MPN/100ml	05/23/03	mam
SM18 9223	Total Coliform Count	1.00	U		1.00	MPN/100ml	05/23/03	mam
SM18 2120B	Color	5.0			2.5	Pt/Co	05/23/03	mam
SM18 2150B	Odor	1			1	T.O.N.	05/23/03	mam
SM18 4500Cl	Chloride	184			25	mg/L	05/27/03	mam
SM18 4500CNE	Cyanide, Total	0.0100	U		0.0100	mg/L	05/27/03	nmd
SM18 4500NO2B	Nitrite as N (NO2-N)	0.01	U		0.01	mg/L	05/23/03	nmd
EPA 300.0	Ion Chromatography Analysis							
	Fluoride	1.00	U		1.00	mg/L	05/23/03	rmc
	Nitrate as N (NO3-N)	4.25			1.00	mg/L	05/23/03	rmc
	Sulfate	28.7			10.0	mg/L	05/23/03	rmc

* In Description = Dry Wgt.

STL Newburgh is a part of Severn Trent Laboratories, Inc.

000155

STL Newburgh
316 Fullerton Avenue
Newburgh, NY 12550

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

224327-1
SPTW0230522G

Lab Name: H2M LABS, INC. Contract: ____

Lab Code: 10478 Case No.: STL-NEWBU SAS No.: _____ SDG No.: STLN002

Matrix: (soil/water) WATER Lab Sample ID: 0305665-001B

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 3A\N3343.D

Level: (low/med) LOW Date Received: 05/23/03

% Moisture: Decanted: (Y/N) N Date Extracted: 05/29/03

Concentrated Extract Volume: 1000 (µL) Date Analyzed: 05/29/03

Injection Volume: 1 (µL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) SPE

CONCENTRATION UNITS: (µg/L or µg/Kg) UG/L

CAS NO.	COMPOUND		Q
77-47-4	Hexachlorocyclopentadiene	0.6	U J
1918-16-7	Propachlor	1	U J
118-74-1	Hexachlorobenzene	0.3	U J
122-34-9	Simazine	0.5	U J
1912-24-9	Atrazine	0.5	U J
21087-64-9	Metribuzin	0.5	U J
15972-60-8	Alachlor	1	U J
51218-45-2	Metolachlor	1	U J
23184-66-9	Butachlor	1	U J
103-23-1	bis(2-Ethylhexyl)adipate	1	U J
117-81-7	Bis(2-ethylhexyl)phthalate	~~1~~ 3	~~U~~ U J
50-32-8	Benzo(a)pyrene	0.1	U J

07/17/03

FORM I SV- 1 OLM04.2

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

224327-1RE

SPTW0230522GRE

Lab Name: H2M LABS, INC. Contract: ____

Lab Code: 10478 Case No.: STL-NEWBU SAS No.: _____ SDG No.: STLN002

Matrix: (soil/water) WATER Lab Sample ID: 0305665-001BRE

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 3A\N3365.D

Level: (low/med) LOW Date Received: 05/23/03

% Moisture: Decanted: (Y/N) N Date Extracted: 05/30/03

Concentrated Extract Volume: 1000 (µL) Date Analyzed: 06/03/03

Injection Volume: 1 (µL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) SPE

CONCENTRATION UNITS: (µg/L or µg/Kg) UG/L

CAS NO.	COMPOUND		Q
77-47-4	Hexachlorocyclopentadiene	0.6	U J
1918-16-7	Propachlor	1	U J
118-74-1	Hexachlorobenzene	0.3	U J
122-34-9	Simazine	0.5	U J
1912-24-9	Atrazine	0.5	U J
21087-64-9	Metribuzin	0.5	U J
15972-60-8	Alachlor	1	U J
51218-45-2	Metolachlor	1	U J
23184-66-9	Butachlor	1	U J
103-23-1	bis(2-Ethylhexyl)adipate	1	U J
117-81-7	Bis(2-ethylhexyl)phthalate	~~0.7~~ 3	~~BJ~~ U J
50-32-8	Benzo(a)pyrene	0.1	U J

07/17/03

Do Not Use

FORM I SV- 1 OLM04.2

STLN002 S42

Form 1

CLIENT SAMPLE NO.

224327-1

SPTW0230522G

Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN002

Matrix: (soil/water) Potable Water Lab Sample ID: 0305665-001C

Sample wt/vol: 35 (g/mL) ML Lab File ID: B00501.RAW

Level: (low/med) LOW Date Received: 5/23/03

% Moisture: not dec. Date Extracted: 5/30/03

GC Column: R-35 ID: .53 (mm) Date Analyzed: 5/31/03

Extract Volume: 2000 (µl) Dilution Factor: 1.00

Injection Volume: 1 (µl)

CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L

CAS NO.	COMPOUND		Q
309-00-2	Aldrin	0.03	U J
58-89-9	Lindane	0.03	U J
76-44-8	Heptachlor	0.03	U J
57-74-9	Chlordane	0.5	U J
1024-57-3	Heptachlor epoxide	0.03	U J
	Total PCBs	0.5	U J
60-57-1	Dieldrin	0.05	U J
72-20-8	Endrin	0.05	U J
72-43-5	Methoxychlor	0.3	U J
8001-35-2	Toxaphene	3	U J

07/17/03

FORM I VOA E505

Form 1

CLIENT SAMPLE NO.

224327-1
SPTW0230522G

Lab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN002 07/17/03

Matrix: (soil/water) Potable Water Lab Sample ID: 0305665-001E

Sample wt/vol: (g/mL) ML Lab File ID: C1_195.RAW

Level: (low/med) LOW Date Received: 5/23/03

% Moisture: not dec. Date Extracted:

GC Column: C-18 ID: 46 (mm) Date Analyzed: 6/4/03

Extract Volume: _____ (µl) Dilution Factor: 1.00

Injection Volume: 400 (µl)

CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L

CAS NO.	COMPOUND	µg/L	Q
1646-87-3	Aldicarb sulfoxide	1	U J
1646-88-4	Aldicarb sulfone	1	U
23135-22-0	Oxamyl	1	U
16752-77-5	Methomyl	1	U
16655-82-6	3-Hydroxycarbofuran	1	U
116-06-3	Aldicarb	1	U J
1563-66-2	Carbofuran	1	U
63-25-2	Carbaryl	1	U

07/17/03

FORM I VOA E531.1

STLN002 S44

Form 1

CLIENT SAMPLE NO.

224327-1
SPTW0230522G

Lab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN002 07/17/

Matrix: (soil/water) Potable Water Lab Sample ID: 0305665-001F

Sample wt/vol: (g/mL) ML Lab File ID: C1_141.RAW

Level: (low/med) LOW Date Received: 5/23/03

% Moisture: not dec. Date Extracted:

GC Column: K-CATION ID: 46 (mm) Date Analyzed: 5/30/03

Extract Volume: _____ (µl) Dilution Factor: 1.00

Injection Volume: 100 (µl)

CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L

CAS NO.	COMPOUND	µg/L	Q
1071-83-6	Glyphosate	10	U

FORM I VOA E547

STLN002 S45

1E

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

224327-1
SPTW0230522G

ee 07/17/03

Lab Name: H2M LABS, INC. Contract: ____

Lab Code: 10478 Case No.: STL-NEWBUR SAS No.: ____ SDG No.: STLN002

Matrix: (soil/water) WATER Lab Sample ID: 0305665-001A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A00482.RAW

% Moisture: Decanted: (Y/N) N Date Received: 05/23/03

Extraction: (Type) Date Extracted: 05/27/03

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/29/03

Injection Volume: 0.5 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) UG/L	Q
75-99-0	Dalapon	1.0	U J
1918-00-9	Dicamba	0.080	U
94-75-7	2,4-D	0.25	U
87-86-5	Pentachlorophenol	0.20	U
93-72-1	2,4,5-TP (Silvex)	0.13	U
88-85-7	Dinoseb	0.20	U
1918-02-1	Picloram	1.3	U

ee 07/17/03

FORM I PEST OLM04.2

STLN002 S46

Form 1

CLIENT SAMPLE NO.

224327-1
SPTW0230522
ee 07/17

Lab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN002

Matrix: (soil/water) Potable Water Lab Sample ID: 0305665-001G

Sample wt/vol: 250 (g/mL) ML Lab File ID: C2_108.RAW

Level: (low/med) LOW Date Received: 5/23/03

% Moisture: not dec. Date Extracted: 5/27/03

GC Column: PRP-1 ID: 46 (mm) Date Analyzed: 5/29/03

Extract Volume: 10000 (µl) Dilution Factor: 1.00

Injection Volume: 200 (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L	Q
85-00-7	Diquat	1	U

FORM I VOA E549.1

STLN002 S47

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SR003A30121G

Lab Name: STL Newburgh Contract: 01003.10

Lab Code: 10142 Case No.: ____ SAS No.: ____ SDG No.: 220264

Matrix: (soil/water) WATER Lab Sample ID: 220264-003

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V5289.D

Level: (low/med) LOW Date Received: 1/22/2003

% Moisture: not dec. ____ Date Analyzed: 1/23/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: ____ (uL) Soil Aliquot Volume: ____ (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND (ug/L or ug/Kg) UG/L		Q
75-71-8	Dichlorodifluoromethane	0.5	U
74-87-3	Chloromethane	0.5	U
74-83-9	Bromomethane	0.5	U
75-01-4	Vinyl Chloride	0.5	U
75-00-3	Chloroethane	0.5	U
75-69-4	Trichlorofluoromethane	0.5	U
76-13-1	Freon 113	0.5	U
67-64-1	Acetone	0.5	U
75-15-0	Carbon Disulfide	0.5	U
75-09-2	Methylene Chloride	0.5	U
75-35-4	1,1-Dichloroethene	0.5	U
75-34-4	1,1-Dichloroethane	0.5	U
156-60-5	trans-1,2-Dichloroethylene	0.5	U
540-59-0	cis-1,2-Dichloroethene	0.5	U
67-66-3	Chloroform	0.5	U
107-06-2	1,2-Dichloroethane	0.5	U
78-93-3	2-Butanone	0.5	U
71-55-6	1,1,1-Trichloroethane	0.5	U
56-23-5	Carbon Tetrachloride	0.5	U
75-27-4	Bromodichloromethane	0.5	U
78-87-5	1,2-Dichloropropane	0.5	U
10061-01-5	cis-1,3-Dichloropropene	0.5	U
79-01-6	Trichloroethene	0.5	U
71-43-2	Benzene	0.5	U
124-48-1	Dibromochloromethane	0.5	U
10061-02-6	trans-1,3-Dichloropropene	0.5	U
79-00-5	1,1,2-Trichloroethane	0.5	U
75-25-2	Bromoform	0.5	U
108-10-1	4-Methyl-2-Pentanone	0.5	U
591-78-6	2-Hexanone	0.5	U
127-18-4	Tetrachloroethene	0.5	U
108-88-3	Toluene	0.5	U
108-90-7	Chlorobenzene	0.5	U
100-41-4	Ethylbenzene	0.5	U
100-42-5	Styrene	0.5	U
1634-04-4	MTBE	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U
1330-20-7	Xylenes, total	0.5	U

000034

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 562-0890
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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SR003A30121X

Lab Name: STL Newburgh Contract: 01003.10

Lab Code: 10142 Case No.: ____ SAS No.: ____ SDG No.: 220264

Matrix: (soil/water) WATER Lab Sample ID: 220264-004

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V5290.D

Level: (low/med) LOW Date Received: 1/22/2003

% Moisture: not dec. ____ Date Analyzed: 1/23/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: ____ (uL) Soil Aliquot Volume: ____ (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND (ug/L or ug/Kg) UG/L		Q
75-71-8	Dichlorodifluoromethane	0.5	U
74-87-3	Chloromethane	0.5	U
74-83-9	Bromomethane	0.5	U
75-01-4	Vinyl Chloride	0.5	U
75-00-3	Chloroethane	0.5	U
75-69-4	Trichlorofluoromethane	0.5	U
76-13-1	Freon 113	0.5	U
67-64-1	Acetone	0.5	U
75-15-0	Carbon Disulfide	0.5	U
75-09-2	Methylene Chloride	0.5	U
75-35-4	1,1-Dichloroethene	0.5	U
75-34-4	1,1-Dichloroethane	0.5	U
156-60-5	trans-1,2-Dichloroethylene	0.5	U
540-59-0	cis-1,2-Dichloroethene	0.5	U
67-66-3	Chloroform	0.5	U
107-06-2	1,2-Dichloroethane	0.5	U
78-93-3	2-Butanone	0.5	U
71-55-6	1,1,1-Trichloroethane	0.5	U
56-23-5	Carbon Tetrachloride	0.5	U
75-27-4	Bromodichloromethane	0.5	U
78-87-5	1,2-Dichloropropane	0.5	U
10061-01-5	cis-1,3-Dichloropropene	0.5	U
79-01-6	Trichloroethene	0.5	U
71-43-2	Benzene	0.5	U
124-48-1	Dibromochloromethane	0.5	U
10061-02-6	trans-1,3-Dichloropropene	0.5	U
79-00-5	1,1,2-Trichloroethane	0.5	U
75-25-2	Bromoform	0.5	U
108-10-1	4-Methyl-2-Pentanone	0.5	U
591-78-6	2-Hexanone	0.5	U
127-18-4	Tetrachloroethene	0.5	U
108-88-3	Toluene	0.5	U
108-90-7	Chlorobenzene	0.5	U
100-41-4	Ethylbenzene	0.5	U
100-42-5	Styrene	0.5	U
1634-04-4	MTBE	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U
1330-20-7	Xylenes, total	0.5	U

000041

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 562-0890
Fax (845) 562-0841

LABORATORY TEST RESULTS

Job Number: 220400 Date:02/04/2003

BUSINESS: Schneider Electric ATTN: Dorothy Bergman

PROJECT: 0100C.10.0203.SIDL

Customer Sample ID: SR003A30124G
Date Sampled.....: 01/24/2003
Time Sampled.....: 11:00
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 220400-2
Date Received.....: 01/24/2003
Time Received.....: 12:25

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q FLAGS	DF	RL	DILUTION	UNITS	DT	DATE	TECH
EPA 200.7	Hardness by calculation									
	Hardness, Total as CaCO3	330			2.50	1	mg/L		01/28/03	mad
EPA 200.7	Metals Analysis (ICP)									
	Calcium (Ca)	71000		123	500	1	ug/L		01/28/03	mad
	Magnesium (Mg)	37200		6.8	500	1	ug/L		01/28/03	mad

000010

* In Description = Dry Wgt.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. SR003A30302G

Lab Name: STL Newburgh Contract: 01003.10

Lab Code: 10142 Case No.: ____ SAS No.: ____ SDG No.: ____

Matrix: (soil/water) WATER Lab Sample ID: 221570-001

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: A8255.D

Level: (low/med) LOW Date Received: 3/3/2003

% Moisture: not dec. ____ Date Analyzed: 3/6/2003

GC Column: RTX-502.2 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: ____ (uL) Soil Aliquot Volume: ____ (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
1634-04-4	MTBE		U	0.5
71-43-2	Benzene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
108-38-3/106-42-	m,p-Xylene		U	0.5
95-47-6	o-Xylene		U	0.5
100-42-5	Styrene		U	0.5
98-82-8	Isopropylbenzene		U	0.5
103-65-1	n-Propylbenzene		U	0.5
108-67-8	1,3,5-Trimethylbenzene		U	0.5
98-06-6	tert-Butylbenzene		U	0.5
95-63-6	1,2,4-Trimethylbenzene		U	0.5
135-98-8	sec-Butylbenzene		U	0.5
99-87-6	p-Isopropyltoluene		U	0.5
541-73-1	1,3-Dichlorobenzene		U	0.5
106-46-7	1,4-Dichlorobenzene		U	0.5
104-51-8	n-Butylbenzene		U	0.5
95-50-1	1,2-Dichlorobenzene		U	0.5
120-82-1	1,2,4-Trichlorobenzene		U	0.5
91-20-3	Naphthalene		U	0.5
87-61-6	1,2,3-Trichlorobenzene		U	0.5
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
74-83-9	Bromomethane		U	0.5
75-00-3	Chloroethane	0.5UJ	U	0.5
75-69-4	Trichlorofluoromethane	0.5UJ	U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-09-2	Methylene Chloride		U	0.5
156-60-5	trans-1,2-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
590-20-7	2,2-Dichloropropane		U	0.5
67-66-3	Chloroform		U	0.5
74-97-5	Bromochloromethane		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
563-58-6	1,1-Dichloropropene	0.5UJ	U	0.5
56-23-5	Carbon Tetrachloride		U	0.5

L. Drakulich 7/10/03

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SR003A30302G

Lab Name: STL Newburgh Contract: 01003.10

Lab Code: 10142 Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: 221570-001

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: A8255.D

Level: (low/med) LOW Date Received: 3/3/2003

% Moisture: not dec. _____ Date Analyzed: 3/6/2003

GC Column: RTX-502.2 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
106-93-4	1,2-Dichloroethane		U	0.5
79-01-6	Trichloroethene		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
75-27-4	Bromodichloromethane		U	0.5
74-95-3	Dibromomethane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
142-28-9	1,3-Dichloropropane		U	0.5
127-18-4	Tetrachloroethene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
106-93-4	1,2-Dibromoethane		U	0.5
79-34-5	1,1,1,2-Tetrachloroethane		U	0.5
75-25-2	Bromoform		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
96-18-4	1,2,3-Trichloropropane		U	0.5
108-86-1	Bromobenzene		U	0.5
95-49-8	2-Chlorotoluene		U	0.5
106-43-4	4-Chlorotoluene		U	0.5
96-12-8	1,2-Dibromo-3-chloropropane		U	0.5
87-68-3	Hexachlorobutadiene		U	0.5

LABORATORY TEST RESULTS

Job Number: 221570 Date: 03/12/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SR003A30302G
Date Sampled.....: 03/02/2003
Time Sampled.....: 18:35
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 221570-1
Date Received.....: 03/03/2003
Time Received.....: 10:10

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TEC
EPA 504	GC Micro-Extractable Volatiles							
	1,2-Dibromoethane (EDB)	0.020	U		0.020	ug/L	03/10/03	smo
	1,2-Dibromo-3-chloropropane	0.020	U		0.020	ug/L	03/10/03	smo

* In Description = Dry Wgt.

LABORATORY TEST RESULTS

Job Number: 221570 Date:03/26/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SR003A30302G
Date Sampled.....: 03/02/2003
Time Sampled.....: 18:35
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 221570-1
Date Received.....: 03/03/2003
Time Received.....: 10:10

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	RL	DILUTION	UNITS	BY	DATE	TECH
SM18 3113B	Antimony (Sb)	1.9	U	U	1.9	3.0	1	ug/L	03/10/03	mah
SM18 3113B	Selenium (Se)	1.4	U		1.4	5.0	1	ug/L	03/05/03	mah
EPA 245.1	Mercury (Hg)	0.20	U		0.20	0.20	1	ug/L	03/04/03	lms
EPA 200.9	Metals Analysis (GFAA)									
	Thallium (Tl)	1.0	U	U	1.0	1.5	1	ug/L	03/09/03	mah
EPA 200.7	Metals Analysis (ICP)									
	Arsenic (As)	3.2	U		3.2	10.0	1	ug/L	03/07/03	mad
	Barium (Ba)	177	B		0.50	200	1	ug/L	03/07/03	mad
	Beryllium (Be)	0.40	U		0.40	5.0	1	ug/L	03/07/03	mad
	Cadmium (Cd)	0.30	U		0.30	5.0	1	ug/L	03/07/03	mad
	Chromium (Cr)	1.2	U		1.2	10.0	1	ug/L	03/07/03	mad
	Iron (Fe)	5.0	U	U	5.0	100	1	ug/L	03/07/03	mad
	Manganese (Mn)	460			1.3	15.0	1	ug/L	03/07/03	mad
	Nickel (Ni)	2.4	U		2.4	40.0	1	ug/L	03/07/03	mad
	Silver (Ag)	2.5	U		2.5	10.0	1	ug/L	03/07/03	mad
	Sodium (Na)	10400			212	5000	1	ug/L	03/07/03	mad
	Zinc (Zn)	1.9	U		1.9	20.0	1	ug/L	03/07/03	mad

DOE.KSM — 7/11/03

* In Description = Dry Wgt.

000134

LABORATORY TEST RESULTS

Job Number: 221570 Date: 07/08/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SR003A30302G
Date Sampled.....: 03/02/2003
Time Sampled.....: 18:35
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 221570-1
Date Received.....: 03/03/2003
Time Received.....: 10:10

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
SM18 2120B	Color	10			2.5	Pt/Co	03/03/03	mam
SM18 2150B	Odor	1			1	T.O.N.	03/03/03	mam
SM18 4500Cl	Chloride	16.1			5.0	mg/L	03/04/03	mam
SM18 4500CNE	Cyanide, Total	0.0100	U		0.0100	mg/L	03/07/03	nmd
SM18 4500NO2B	Nitrite as N (NO2-N)	0.01	U		0.01	mg/L	03/04/03	nmd
EPA 300.0	Ion Chromatography Analysis							
	Fluoride	0.500	U		0.500	mg/L	03/04/03	bg
	Nitrate as N (NO3-N)	0.500	U		0.500	mg/L	03/04/03	bg
	Sulfate	81.4			20.0	mg/L	03/05/03	bg

* In Description = Dry Wgt.

STL Newburgh is a part of Severn Trent Laboratories, Inc.

SEVERN TRENT STL

NYSDOH 10142 NJDEP 73015 CTDOHS PH-0554 EPA NY049 PA 68-[illegible]

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 562-0890

Environmental Health Laboratories
Sample Result Record Sheet

Sample Matrix: DW
Acquisition File: Not Available
Data Directory: 030603a
Instrument: GC/MS - T
Extracted Date: 03/06/2003
Sample Number: 857593
Dilution Factor: 10
Sample Site: 221570-1
Sample Location: SR003A303026

Method: 548.1
Calibration File: m-548 1-t-070502.mth
Analysis Date: 03/06/2003
Analysis Time: 22:41
Analyst: werbians
Results Submitted By: werbians
Run Number: 52129

Sample Quality Control

Internal Standards Parameter	Area	CCC Area	CCC % Resp	CCC Area Limits Lwr	CCC Area Limits Upr	CCC Pass /Fail	IC Avg Area	IC % Resp	IC Area Limits Lwr	IC Area Limits Upr	IC Pass /Fail
IS-4,4'-Dibromooctafluorobiphenyl	223879	313273	71	70	130	PASS	Not Found	N/A	N/A	N/A	N/A

Surrogate Standards Parameter	Amount	Units	Target	%Rec	Limits Lower	Limits Upper	Pass/Fail
SS-2,4-Dichlorophenylacetic acid	475.337	ug/L	50	95	70	130	PASS

Ordered Parameter Results

Parameter	Amount	MRL	Units
Endothall	< 9.0	9.0	ug/L

Additional Found Parameters

Parameter	Amount	MRL	Units

The symbol * in the Amount column above indicates that the sample was re-analyzed for that parameter and the results are presented on another page.

SEVERN TRENT STL

Doug Tawse
STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550

March 28, 2003

Dear Doug:

Please find enclosed results for three (3) samples, Billing Ref: Shenandoah, STL Job #205996, which you submitted for asbestos analysis by Transmission Electron Microscopy (TEM).

The results are listed according to the NYELAP Certification Manual and USEPA Phase II Primary and Secondary Drinking Water Regulations EPA Method 100.2 ("<" is equal to the value of the detection limit).

CLIENT SAMPLE ID	A (million fibers/liter)	DATE FILTERED	DATE ANALYZED
221570-1 SR003A303026	<0.178	03/04/03; 11:25	03/28/03; 10:40
221715-1	<0.178	03/06/03; 11:41	03/28/03; 11:00
221992-1	<0.195	03/13/03; 11:18	03/28/03; 11:59

The final maximum contaminant level goal (MCLG) and maximum contaminant level (MCL) for asbestos in water is 7.0 Million fibers/liter.

STL Billerica is accredited by NYELAP (#10838) and the Commonwealth of Massachusetts (#M-MA038) for asbestos analysis of water samples

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted above.

Severn Trent Laboratories is not responsible for incorrect sampling procedures since these water samples were not collected by our lab personnel. STL is only responsible for the analysis and reporting of submitted samples. Accreditation in no way constitutes or implies product certification, approval, or endorsement by NELAC. This report relates only to the specific samples tested herein. The enclosed report shall not be reproduced except in full, without the written approval of STL.

Should you have further questions, or need additional information, please feel free to contact Client Services or me at any time.

Sincerely,

Ernest T. Dobi

Ernest T. Dobi, Ph.D.
Manager-Microscopy Service

A part of Severn Trent plc

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Hazen Research, Inc.
4601 Indiana Street
Golden, CO 80403 USA
Tel: (303) 279-4501
Fax: (303) 278-1528

DATE	March 25, 2003
HRI PROJECT	002-CE3
HRI SERIES NO.	C046/03
DATE REC'D	03/05/2003
CUST. P.O.#	3-03

STL Newburgh
D. Tause
315 Fullerton Avenue
Newburgh, NY 12550

REPORT OF ANALYSIS

SAMPLE NO. C046/03-1

SAMPLE IDENTIFICATION: 221570-1 - SR003A30302G - Shenandoah - sampled on 03/02/2003 @ 1835

PARAMETER	RESULT	DETECTION LIMIT	METHOD	ANALYSIS DATE	ANALYST
Radon (+-Precision*), pCi/l (T)	240(+-20)	15	SM 7500-Rn B	03/05/2003 @ 1915	MRA

*Variability of the radioactive decay process (counting error) at the 95% confidence level, 1.96 sigma.
Certification ID's: CO/EPA - CO00008; CT - PH-0152; KY - 90076; KS - E-10265; NH - 232801-A;
NY ELAP - 11417; PA DEP 68551; WI - 998376610

CODES:
(T) = Total (D) = Dissolved
(S) = Suspended (R) = Total Recoverable
(PD) = Potentially Dissolved
< = Less Than

By: Robert Rostad
Laboratory Manager

An Employee-Owned Company

STL ST. LOUIS

STL NEWBURGH

Client Sample ID: SR003A30302G

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F3C140360-001
Work Order: FJ7WV
Matrix: WATER

Date Collected: 03/02/03 1835
Date Received: 03/14/03 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
GROSS A/B BY GFPC EPA 900.0 MOD				pCi/L	900.0 MOD			
Gross Alpha	8.9		3.5	3.4	03/18/03	03/22/03	3078224	
Gross Beta	~~4.4~~ 4.2	U	2.7	4.2	03/18/03	03/22/03	3078224	
RA-226 BY EPA-903.0 MOD				pCi/L	903.0 MOD			
Radium (226)	0.25	J	0.15	0.20	03/25/03	04/11/03	3084253	73
RA-228 BY GFPC EPA 904 MOD				pCi/L	904 MOD			
Radium 228	~~0.60~~ 0.78	UJ	0.49	0.78	03/25/03	04/11/03	3084254	73

DAR 7/20/03

NOTE(S)
Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Bold results are greater than the MDC
J Result is greater than sample detection limit but less than stated reporting limit.
U Result is less than the sample detection limit.

LOT# F3C140360

STL NEWBURGH

Client Sample ID: SR003A30302G

Trace Level Organic Compounds

Lot-Sample #...: G3C140254-001 Work Order #...: FJ65R1AA Matrix.....: WATER
Date Sampled...: 03/02/03 Date Received..: 03/14/03
Prep Date.....: 03/17/03 Analysis Date..: 03/20/03
Prep Batch #...: 3076561
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	5.0	pg/L	EPA-5 1613B-Tetra

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	107	(25 - 141)

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

221570-1
SR003A30302G

Lab Name: H2M LABS, INC. Contract: ____

Lab Code: 10478 Case No.: STL-NEWBU SAS No.: _____ SDG No.: STLN001

Matrix: (soil/water) WATER Lab Sample ID: 0303083-001B

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 3A\N2610.D

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: Decanted: (Y/N) N Date Extracted: 03/11/03

Concentrated Extract Volume: 1000 (µL) Date Analyzed: 03/14/03

Injection Volume: 1 (µL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) SPE

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) UG/L	Q
77-47-4	Hexachlorocyclopentadiene	0.6	U
1918-16-7	Propachlor	1	U
118-74-1	Hexachlorobenzene	0.3	U J
122-34-9	Simazine	0.5	U J
1912-24-9	Atrazine	0.5	U
21087-64-9	Metribuzin	0.5	U
15972-60-8	Alachlor	1	U J
51218-45-2	Metolachlor	1	U J
23184-66-9	Butachlor	1	U
103-23-1	bis(2-Ethylhexyl)adipate	1	U J
117-81-7	Bis(2-ethylhexyl)phthalate	3	U
50-32-8	Benzo(a)pyrene	0.1	U J

FORM I SV- 1 OLM04.2

Form 1

CLIENT SAMPLE NO.

221570-1
SR003A30302G

Lab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN001 ee 07/04/6

Matrix: (soil/water) Potable Water Lab Sample ID: 0303083-001C

Sample wt/vol: 35 (g/mL) ML Lab File ID: B00123.RAW

Level: (low/med) LOW Date Received: 3/5/03

% Moisture: not dec. Date Extracted: 3/7/03

GC Column: R-35 ID: .53 (mm) Date Analyzed: 3/11/03

Extract Volume: 2000 (µl) Dilution Factor: 1.00

Injection Volume: 1 (µl)

CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L

CAS NO.	COMPOUND	µg/L	Q
309-00-2	Aldrin	0.03	U
58-89-9	Lindane	0.03	U
76-44-8	Heptachlor	0.03	U
57-74-9	Chlordane	0.5	U
1024-57-3	Heptachlor epoxide	0.03	U
	Total PCBs	0.5	U
60-57-1	Dieldrin	0.05	U
72-20-8	Endrin	0.05	U
72-43-5	Methoxychlor	0.3	U
8001-35-2	Toxaphene	3	U

FORM I VOA E505

STLN001 S42

Form 1

CLIENT SAMPLE NO.

221570-1
SR003A30302G ee 07/0

Lab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN001

Matrix: (soil/water) Potable Water Lab Sample ID: 0303083-001E

Sample wt/vol: (g/mL) ML Lab File ID: C1-021.RAW

Level: (low/med) LOW Date Received: 3/5/03

% Moisture: not dec. Date Extracted:

GC Column: C-18 ID: 46 (mm) Date Analyzed: 3/15/03

Extract Volume: _____ (µl) Dilution Factor: 1.00

Injection Volume: 400 (µl)

CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L

CAS NO.	COMPOUND	µg/L	Q
1646-87-3	Aldicarb sulfoxide	1	U
1646-88-4	Aldicarb sulfone	1	U
23135-22-0	Oxamyl	1	U
16752-77-5	Methomyl	1	U
16655-82-6	3-Hydroxycarbofuran	1	U
116-06-3	Aldicarb	1	U
1563-66-2	Carbofuran	1	U
63-25-2	Carbaryl	1	U

FORM I VOA E531.1

Form 1

CLIENT SAMPLE NO.

221570-1
SR003A303 02G
07/04/01

Lab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN001

Matrix: (soil/water) Potable Water Lab Sample ID: 0303083-001F

Sample wt/vol: (g/mL) ML Lab File ID: C1-058.RAW

Level: (low/med) LOW Date Received: 3/5/03

% Moisture: not dec. Date Extracted:

GC Column: ID: (mm) Date Analyzed: 3/16/03

Extract Volume: _____ (µl) Dilution Factor: 1.00

Injection Volume: 100 (µl)

CONCENTRATION UNITS:

CAS NO.	COMPOUND (ug/L or ug/Kg)	µg/L	Q
1071-83-6	Glyphosate	10	U

FORM I VOA

E547

STLN001 S44

Form 1

CLIENT SAMPLE NO.

221570-1
SR003A303 02G
07/

ab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN001

Matrix: (soil/water) Potable Water Lab Sample ID: 0303083-001G

Sample wt/vol: 250 (g/mL) ML Lab File ID: C2-073.RAW

Level: (low/med) LOW Date Received: 3/5/03

% Moisture: not dec. Date Extracted: 3/7/03

GC Column: PRP-1 ID: 4.1 (mm) Date Analyzed: 3/26/03

Extract Volume: 10000 (µl) Dilution Factor: 1.00

Injection Volume: 100 (µl)

CONCENTRATION UNITS:

CAS NO.	COMPOUND (ug/L or ug/Kg)	µg/L	Q
85-00-7	Diquat	1	U

FORM I VOA

E549.1

STLN001 S45

LABORATORY TEST RESULTS

Job Number: 224090

Date: 05/21/2003

CUSTOMER: Groundwater Sciences | PROJECT: 01003.10.0203 | ATTN: Dorothy Bergmann

Customer Sample ID: SRTW03305156
Date Sampled.....: 05/15/2003
Time Sampled.....: 09:30
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 224090-1
Date Received.....: 05/15/2003
Time Received.....: 11:18

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
SW846 5030(5mL	Sample Preparation	Complete				Text	05/20/03	pcp
EPA 524.2	Volatile Organics							
	Dichlorodifluoromethane	0.50	U		0.50	ug/L	05/19/03	pcp
	Chloromethane	0.50	U		0.50	ug/L	05/19/03	pcp
	Vinyl chloride	0.50	U		0.50	ug/L	05/19/03	pcp
	Bromomethane	0.50	U		0.50	ug/L	05/19/03	pcp
	Chloroethane	0.50	U		0.50	ug/L	05/19/03	pcp
	Trichlorofluoromethane	0.50	U		0.50	ug/L	05/19/03	pcp
	1,1-Dichloroethene	0.50	U		0.50	ug/L	05/19/03	pcp
	Methylene chloride	1.0	U		1.0	ug/L	05/19/03	pcp
	trans-1,2-Dichloroethene	0.50	U		0.50	ug/L	05/19/03	pcp
	Methyl-tert-butyl-ether (MTBE)	0.50	U		0.50	ug/L	05/19/03	pcp
	1,1-Dichloroethane	0.50	U		0.50	ug/L	05/19/03	pcp
	2,2-Dichloropropane	0.50	U		0.50	ug/L	05/19/03	pcp
	cis-1,2-Dichloroethene	0.50	U		0.50	ug/L	05/19/03	pcp
	Bromochloromethane	0.50	U		0.50	ug/L	05/19/03	pcp
	Chloroform	0.50	U		0.50	ug/L	05/19/03	pcp
	1,1,1-Trichloroethane	0.50	U		0.50	ug/L	05/19/03	pcp
	1,1-Dichloropropene	0.50	U		0.50	ug/L	05/19/03	pcp
	Carbon tetrachloride	0.50	U		0.50	ug/L	05/19/03	pcp
	Benzene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,2-Dichloroethane	0.50	U		0.50	ug/L	05/19/03	pcp
	Trichloroethene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,2-Dichloropropane	0.50	U		0.50	ug/L	05/19/03	pcp
	Dibromomethane	0.50	U		0.50	ug/L	05/19/03	pcp
	Bromodichloromethane	0.50	U		0.50	ug/L	05/19/03	pcp
	cis-1,3-Dichloropropene	0.50	U		0.50	ug/L	05/19/03	pcp
	Toluene	0.50	U		0.50	ug/L	05/19/03	pcp
	trans-1,3-Dichloropropene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,1,2-Trichloroethane	0.50	U		0.50	ug/L	05/19/03	pcp
	Tetrachloroethene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,3-Dichloropropane	0.50	U		0.50	ug/L	05/19/03	pcp
	Dibromochloromethane	0.50	U		0.50	ug/L	05/19/03	pcp
	1,2-Dibromoethane (EDB)	0.50	U		0.50	ug/L	05/19/03	pcp
	Chlorobenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,1,1,2-Tetrachloroethane	0.50	U		0.50	ug/L	05/19/03	pcp
	Ethylbenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	m&p-Xylenes	0.50	U		0.50	ug/L	05/19/03	pcp
	o-Xylene	0.50	U		0.50	ug/L	05/19/03	pcp
	Styrene	0.50	U		0.50	ug/L	05/19/03	pcp
	Bromoform	0.50	U		0.50	ug/L	05/19/03	pcp
	Isopropylbenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,1,2,2-Tetrachloroethane	0.50	U		0.50	ug/L	05/19/03	pcp
	Bromobenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,2,3-Trichloropropane	0.50	U		0.50	ug/L	05/19/03	pcp
	n-Propylbenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	2-Chlorotoluene	0.50	U		0.50	ug/L	05/19/03	pcp

* In Description = Dry Wgt.

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SEVERN TRENT STL

NYSDOH 10142 NJDEP 73015 CTDOHS PH-0554 EPA NY049 PA 68-378

000022

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 562-0890

LABORATORY TEST RESULTS

Job Number: 224090

Date: 05/21/2003

CUSTOMER: Groundwater Sciences | PROJECT: 01003.10.0203 | ATTN: Dorothy Bergmann

Customer Sample ID: SRTW03305156
Date Sampled.....: 05/15/2003
Time Sampled.....: 09:30
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 224090-1
Date Received.....: 05/15/2003
Time Received.....: 11:18

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TEC
	1,3,5-Trimethylbenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	4-Chlorotoluene	0.50	U		0.50	ug/L	05/19/03	pcp
	tert-Butylbenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,2,4-Trimethylbenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	sec-Butylbenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,3-Dichlorobenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	p-Isopropyltoluene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,4-Dichlorobenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	n-Butylbenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,2-Dichlorobenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,2-Dibromo-3-chloropropane	0.50	U		0.50	ug/L	05/19/03	pcp
	1,2,4-Trichlorobenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	Hexachlorobutadiene	0.50	U		0.50	ug/L	05/19/03	pcp
	Naphthalene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,2,3-Trichlorobenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	tert-Butyl alcohol	~~5.0~~	~~U~~	R	5.0	ug/L	05/19/03	pcp

mu 07/15/03

* In Description = Dry Wgt.

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SEVERN TRENT STL

NYSDOH 10142 NJDEP 73015 CTDOHS PH-0554 EPA NY049 PA 68-378 M-NY049

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 562-0890

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SRTW0330515G

Lab Name: STL Newburgh Contract: 01003.10

Lab Code: 10142 Case No.: _____ SAS No.: _____ SDG No.: 224090

Matrix: (soil/water) WATER Lab Sample ID: 224090-001

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6785.D

Level: (low/med) LOW Date Received: 5/15/2003

% Moisture: not dec. _____ Date Analyzed: 5/19/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Number TICs found: 1

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1 ~~000071-23-8~~	~~1-Propanol~~	~~8.60~~	~~2~~	~~JN~~ R

07/15/03

LABORATORY TEST RESULTS

Job Number: 224090 Date: 05/21/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 ATTN: Dorothy Bergmann

Customer Sample ID: ST1305150515
Date Sampled.....: 05/15/2003
Time Sampled.....: 00:00
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 224090-2
Date Received.....: 05/15/2003
Time Received.....: 11:18

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TE
SW846 5030(5mL	Sample Preparation	Complete				Text	05/20/03	pc
EPA 524.2	Volatile Organics							
	Dichlorodifluoromethane	0.50	U		0.50	ug/L	05/19/03	pc
	Chloromethane	0.50	U		0.50	ug/L	05/19/03	pc
	Vinyl chloride	0.50	U		0.50	ug/L	05/19/03	pc
	Bromomethane	0.50	U		0.50	ug/L	05/19/03	pc
	Chloroethane	0.50	U		0.50	ug/L	05/19/03	pc
	Trichlorofluoromethane	0.50	U		0.50	ug/L	05/19/03	pc
	1,1-Dichloroethene	0.50	U		0.50	ug/L	05/19/03	pc
	Methylene chloride	1.0	U		1.0	ug/L	05/19/03	pc
	trans-1,2-Dichloroethene	0.50	U		0.50	ug/L	05/19/03	pc
	Methyl-tert-butyl-ether (MTBE)	0.50	U		0.50	ug/L	05/19/03	pc
	1,1-Dichloroethane	0.50	U		0.50	ug/L	05/19/03	pc
	2,2-Dichloropropane	0.50	U		0.50	ug/L	05/19/03	pc
	cis-1,2-Dichloroethene	0.50	U		0.50	ug/L	05/19/03	pcp
	Bromochloromethane	0.50	U		0.50	ug/L	05/19/03	pcp
	Chloroform	0.50	U		0.50	ug/L	05/19/03	pcp
	1,1,1-Trichloroethane	0.50	U		0.50	ug/L	05/19/03	pcp
	1,1-Dichloropropene	0.50	U		0.50	ug/L	05/19/03	pcp
	Carbon tetrachloride	0.50	U		0.50	ug/L	05/19/03	pcp
	Benzene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,2-Dichloroethane	0.50	U		0.50	ug/L	05/19/03	pcp
	Trichloroethene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,2-Dichloropropane	0.50	U		0.50	ug/L	05/19/03	pcp
	Dibromomethane	0.50	U		0.50	ug/L	05/19/03	pcp
	Bromodichloromethane	0.50	U		0.50	ug/L	05/19/03	pcp
	cis-1,3-Dichloropropene	0.50	U		0.50	ug/L	05/19/03	pcp
	Toluene	0.50	U		0.50	ug/L	05/19/03	pcp
	trans-1,3-Dichloropropene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,1,2-Trichloroethane	0.50	U		0.50	ug/L	05/19/03	pcp
	Tetrachloroethene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,3-Dichloropropane	0.50	U		0.50	ug/L	05/19/03	pcp
	Dibromochloromethane	0.50	U		0.50	ug/L	05/19/03	pcp
	1,2-Dibromoethane (EDB)	0.50	U		0.50	ug/L	05/19/03	pcp
	Chlorobenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,1,1,2-Tetrachloroethane	0.50	U		0.50	ug/L	05/19/03	pcp
	Ethylbenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	m&p-Xylenes	0.50	U		0.50	ug/L	05/19/03	pcp
	o-Xylene	0.50	U		0.50	ug/L	05/19/03	pcp
	Styrene	0.50	U		0.50	ug/L	05/19/03	pcp
	Bromoform	0.50	U		0.50	ug/L	05/19/03	pcp
	Isopropylbenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,1,2,2-Tetrachloroethane	0.50	U		0.50	ug/L	05/19/03	pcp
	Bromobenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,2,3-Trichloropropane	0.50	U		0.50	ug/L	05/19/03	pcp
	n-Propylbenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	2-Chlorotoluene	0.50	U		0.50	ug/L	05/19/03	pcp

* In Description = Dry Wgt.

LABORATORY TEST RESULTS

Job Number: 224090 Date: 05/21/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 ATTN: Dorothy Bergmann

Customer Sample ID: ST1305150515
Date Sampled.....: 05/15/2003
Time Sampled.....: 00:00
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 224090-2
Date Received.....: 05/15/2003
Time Received.....: 11:18

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
	1,3,5-Trimethylbenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	4-Chlorotoluene	0.50	U		0.50	ug/L	05/19/03	pcp
	tert-Butylbenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,2,4-Trimethylbenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	sec-Butylbenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,3-Dichlorobenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	p-Isopropyltoluene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,4-Dichlorobenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	n-Butylbenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,2-Dichlorobenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,2-Dibromo-3-chloropropane	0.50	U		0.50	ug/L	05/19/03	pcp
	1,2,4-Trichlorobenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	Hexachlorobutadiene	0.50	U		0.50	ug/L	05/19/03	pcp
	Naphthalene	0.50	U		0.50	ug/L	05/19/03	pcp
	1,2,3-Trichlorobenzene	0.50	U		0.50	ug/L	05/19/03	pcp
	tert-Butyl alcohol	~~5.0~~	~~U~~	R	5.0	ug/L	05/19/03	pcp

mm 07/15/03

* In Description = Dry Wgt.

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STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550

SEVERN TRENT STL
NYSDOH 10142 NJDEP 73015

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
ST1305150515

Lab Name: STL Newburgh Contract: 01003.10
Lab Code: 10142 Case No.: SAS No.: SDG No.: 224090
Matrix: (soil/water) WATER Lab Sample ID: 224090-002
Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6786.D
Level: (low/med) LOW Date Received: 5/15/2003
% Moisture: not dec. Date Analyzed: 5/19/2003
GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0
Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

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NYSDOH 10142 NJDEP 73015 CTDOHS PH-0554 EPA NY049

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550

LABORATORY TEST RESULTS

Job Number: 224090 Date: 06/02/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SRTW0330515G
Date Sampled.....: 05/15/2003
Time Sampled.....: 09:30
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 224090-1
Date Received.....: 05/15/2003
Time Received.....: 11:18

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
EPA 504	GC Micro-Extractable Volatiles							
	1,2-Dibromoethane (EDB)	0.020	U		0.020	ug/L	05/23/03	smo
	1,2-Dibromo-3-chloropropane	0.020	U		0.020	ug/L	05/23/03	smo

* In Description = Dry Wgt.

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SEVERN TRENT STL

NYSDOH 10142 NJDEP 73016 CTDOHS PH-0444 EPA NY046

000096

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 563-1000

LABORATORY TEST RESULTS

Job Number: 224090 Date:06/18/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SRTW0330515G
Date Sampled.....: 05/15/2003
Time Sampled.....: 09:30
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 224090-1
Date Received.....: 05/15/2003
Time Received.....: 11:18

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	IDL	RL	DILUTION	UNITS	BY	DATE	TECH
SM18 3113B	Antimony (Sb)	1.3	B	X UJ	1.3	3.0	1	ug/L		05/23/03	mvh
SM18 3113B	Selenium (Se)	1.4	U		1.4	5.0	1	ug/L		05/23/03	mvh
EPA 245.1	Mercury (Hg)	0.20	U		0.20	0.20	1	ug/L		05/18/03	rmc
EPA 200.9	Metals Analysis (GFAA)										
	Thallium (Tl)	1.6	Y	UJ	1.6	1.5	1	ug/L		05/27/03	mvh
EPA 200.7	Metals Analysis (ICP)										
	Arsenic (As)	2.4	U		2.4	5.0	1	ug/L		05/23/03	mad
	Barium (Ba)	120	B	UJ	4.7	150	1	ug/L		05/23/03	mad
	Beryllium (Be)	0.20	U		0.20	1.0	1	ug/L		05/23/03	mad
	Cadmium (Cd)	0.30	U		0.30	2.0	1	ug/L		05/23/03	mad
	Chromium (Cr)	3.1	B		0.70	10.0	1	ug/L		05/23/03	mad
	Iron (Fe)	47.0	U		47.0	60.0	1	ug/L		05/23/03	mad
	Manganese (Mn)	537			0.60	10.0	1	ug/L		05/23/03	mad
	Nickel (Ni)	1.2	U		1.2	10.0	1	ug/L		05/23/03	mad
	Silver (Ag)	2.6	U		2.6	10.0	1	ug/L		05/23/03	mad
	Sodium (Na)	8010		F J	138	200	1	ug/L		05/23/03	mad
	Zinc (Zn)	15.2	B		2.9	20.0	1	ug/L		05/23/03	mad

(Ag Wilkinson) 7/21/03

* In Description = Dry Wgt.

LABORATORY TEST RESULTS

Job Number: 226090 Date: 07/17/2003

Customer Sample ID: SRTW0330515G
Date Sampled.....: 05/15/2003
Time Sampled.....: 09:30
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 226090-1
Date Received.....: 05/15/2003
Time Received.....: 11:18

SM18 9223	E. Coliform Count	1.00	U	1.00	MPN/100ml	05/15/03	tab
SM18 9223	Total Coliform Count	1.00	U	1.00	MPN/100ml	05/15/03	tab
SM18 2120B	Color	15		2.5	Pt/Co	05/15/03	tab
SM18 2150B	Odor	1		1	T.O.N.	05/15/03	tab
SM18 4500Cl	Chloride	21.5		5.0	mg/L	05/19/03	mam
SM18 4500CNE	Cyanide, Total	0.0100	U	0.0100	mg/L	05/20/03	rmd
SM18 4500NO2B	Nitrite as N (NO2-N)	0.01	U	0.01	mg/L	05/16/03	rmd
EPA 300.0	Ion Chromatography Analysis						
	Fluoride	0.500	U	0.500	mg/L	05/15/03	bg
	Nitrate as N (NO3-N)	0.500	U	0.500	mg/L	05/15/03	bg
	Sulfate	39.5		10.0	mg/L	05/16/03	bg

* In Description = Dry Wgt.

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000129R

STL

NYSDOH 10948 NJDEP Tests CT/DOHS Provide EML Evers PA 68-270 MAPHAN

STL Newburgh
319 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 562-0890
Fax (845) 562-0841

Environmental Health Laboratories
Sample Result Record Sheet

Sample Matrix: DW
Acquisition File: Not Available
Data Directory: 052003a
Instrument: GC/MS - T
Extracted Date: 05/20/2003
Sample Number: 887946
Dilution Factor: 10
Sample Site: 0305470-001C SRTW0330515G
Sample Location: Not Available

ECD 7/17/03

Method: 548.1
Calibration File: m-548 1-t-042403.mth
Analysis Date: 05/20/2003
Analysis Time: 22:09
Analyst: werblans
Results Submitted By: werblans
Run Number: 54400

Sample Quality Control

Internal Standards Parameter	Area	CCC Area	CCC % Resp	CCC Area Limits Lwr	CCC Area Limits Upr	CCC Pass /Fail	IC Avg Area	IC % Resp	IC Area Limits Lwr	IC Area Limits Upr	IC Pass /Fail
IS-4,4'-Dibromooctafluorobiphenyl	65646	70202	94	70	130	PASS	Not Found	N/A	N/A	N/A	N/A

Surrogate Standards Parameter	Amount	Units	Target	%Rec	Limits Lower	Limits Upper	Pass/Fail
SS-2,4-Dichlorophenylacetic acid	417.101	ug/L	50	83	70	130	PASS

Ordered Parameter Results

Parameter	Amount	MRL	Units
Endothall	< 9.0	9.0	ug/L

Additional Found Parameters

Parameter	Amount	MRL	Units

The symbol * in the Amount column above indicates that the sample was re-analyzed for that parameter and the results are presented on another page.

SEVERN TRENT **STL**

Doug Tawse
STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550

June 6, 2003

Dear Doug:

Please find enclosed results for three (3) samples, Billing Ref: Shanandoah, STL Job #207275, which you submitted for asbestos analysis by Transmission Electron Microscopy (TEM).

The results are listed according to the NYELAP Certification Manual and USEPA Phase II Primary and Secondary Drinking Water Regulations EPA Method 100.2 ("<" is equal to the value of the detection limit).

CLIENT SAMPLE ID	A (million fibers/liter)	DATE FILTERED	DATE ANALYZED
224090-1 SRTW03305156	<0.177	05/16/03; 10:48	06/06/03; 14:20
224327-1	<0.177	05/23/03; 11:11	06/06/03; 14:42
224327-2	<0.177	05/23/03; 11:17	06/06/03; 15:03

The final maximum contaminant level goal (MCLG) and maximum contaminant level (MCL) for asbestos in water is 7.0 Million fibers/liter.

STL Billerica is accredited by NYELAP (#10838) and the Commonwealth of Massachusetts (#M-MA038) for asbestos analysis of water samples

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted above.

Severn Trent Laboratories is not responsible for incorrect sampling procedures since these water samples were not collected by our lab personnel. STL is only responsible for the analysis and reporting of submitted samples. Accreditation in no way constitutes or implies product certification, approval, or endorsement by NELAC. This report relates only to the specific samples tested herein. The enclosed report shall not be reproduced except in full, without the written approval of STL.

Should you have further questions, or need additional information, please feel free to contact Client Services or me at any time.

Sincerely,

Ernest T. Dobi

Ernest T. Dobi, Ph.D.
Manager-Microscopy Service

STL NEWBURGH

Client Sample ID: 224090-1 SRTW03305156

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F3E230213-001
Work Order: FPA2E
Matrix: WATER

Date Collected: 05/15/03 0930
Date Received: 05/23/03 0900

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
GROSS A/B BY GFPC EPA 900.0 MOD				pCi/L	900.0 MOD			
Gross Alpha	7.1		2.3	2.2	06/16/03	06/19/03	3167313	
Gross Beta	4.2		1.4	1.9	06/16/03	06/19/03	3167313	
RA-226 BY EPA-903.0 MOD				pCi/L	903.0 MOD			
Radium (226)	~~0.005~~ 0.14	U	0.092	0.14	05/27/03	06/11/03	3147208	100
RA-228 BY GFPC EPA 904 MOD				pCi/L	904 MOD			
Radium 228	~~0.96~~ 0.65	U	0.39	0.65	05/27/03	06/11/03	3147209	97

DAS 7/21/03

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

U Result is less than the sample detection limit.

VT# F3E230213

STL NEWBURGH

Client Sample ID: SRTW0330515G

Trace Level Organic Compounds

Lot-Sample #...: G3E230368-001 Work Order #...: FPC651AA Matrix.....: WATER
Date Sampled...: 05/15/03 Date Received..: 05/23/03
Prep Date.....: 05/31/03 Analysis Date..: 06/01/03
Prep Batch #...: 3151166
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	5.0	pg/L	EPA-5 1613B-Tetra

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	83	(25 - 141)

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

224090-1
SRTW0330515G

Lab Name: H2M LABS, INC. Contract: ____

Lab Code: 10478 Case No.: STL-NEWBU SAS No.: _____ SDG No.: STLN002

Matrix: (soil/water) WATER Lab Sample ID: 0305470-001B

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 3A\N3329.D

Level: (low/med) LOW Date Received: 05/16/03

% Moisture: Decanted: (Y/N) N Date Extracted: 05/23/03

Concentrated Extract Volume: 1000 (µL) Date Analyzed: 05/29/03

Injection Volume: 1 (µL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) SPE

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(µg/L or µg/Kg) UG/L	Q
77-47-4	Hexachlorocyclopentadiene	0.6	U J
1918-16-7	Propachlor	1	U J
118-74-1	Hexachlorobenzene	0.3	U J
122-34-9	Simazine	0.5	U J
1912-24-9	Atrazine	0.5	U J
21087-64-9	Metribuzin	0.5	U J
15972-60-8	Alachlor	1	U J
51218-45-2	Metolachlor	1	U J
23184-66-9	Butachlor	1	U J
103-23-1	bis(2-Ethylhexyl)adipate	1	U J
117-81-7	Bis(2-ethylhexyl)phthalate	~~0.4~~ 3	~~BJ~~ U J
50-32-8	Benzo(a)pyrene	0.1	U J

07/17/03

FORM I SV- 1 OLM04.2

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

224090-1RE
SRTW0330515GRE

Lab Name: H2M LABS, INC. Contract: ____

Lab Code: 10478 Case No.: STL-NEWBU SAS No.: _____ SDG No.: STLN002 07/17/03

Matrix: (soil/water) WATER Lab Sample ID: 0305470-001BRE

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 3A\N3364.D

Level: (low/med) LOW Date Received: 05/16/03

% Moisture: Decanted: (Y/N) N Date Extracted: 05/30/03

Concentrated Extract Volume: 1000 (µL) Date Analyzed: 06/03/03

Injection Volume: 1 (µL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) SPE

CONCENTRATION UNITS: (µg/L or µg/Kg) UG/L

CAS NO.	COMPOUND		Q
77-47-4	Hexachlorocyclopentadiene	0.6	U
1918-16-7	Propachlor	1	U
118-74-1	Hexachlorobenzene	0.3	U
122-34-9	Simazine	0.5	U
1912-24-9	Atrazine	0.5	U
21087-64-9	Metribuzin	0.5	U
15972-60-8	Alachlor	1	U
51218-45-2	Metolachlor	1	U
23184-66-9	Butachlor	1	U
103-23-1	bis(2-Ethylhexyl)adipate	1	U
117-81-7	Bis(2-ethylhexyl)phthalate	~~0.6~~ 3	~~BJ~~ C
50-32-8	Benzo(a)pyrene	0.1	U

07/17/03

Do Not Use

07/17/03

FORM I SV- 1 OLM04.2

Form 1

CLIENT SAMPLE NO.

224090-1
SRTW0330515G

Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN002 07/17

Matrix: (soil/water) Potable Water Lab Sample ID: 0305470-001E

Sample wt/vol: 35 (g/mL) ML Lab File ID: B00377.RAW

Level: (low/med) LOW Date Received: 5/16/03

% Moisture: not dec. Date Extracted: 5/19/03

GC Column: R-35 ID: .53 (mm) Date Analyzed: 5/20/03

Extract Volume: 2000 (µl) Dilution Factor: 1.00

Injection Volume: 1 (µl)

CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L

CAS NO.	COMPOUND		Q
309-00-2	Aldrin	0.03	U
58-89-9	Lindane	0.03	U
76-44-8	Heptachlor	0.03	U
57-74-9	Chlordane	0.5	U
1024-57-3	Heptachlor epoxide	0.03	U
	Total PCBs	0.5	U
60-57-1	Dieldrin	0.05	U
72-20-8	Endrin	0.05	U
72-43-5	Methoxychlor	0.3	U
8001-35-2	Toxaphene	3	U

FORM I VOA E505

STLN002 S35

Form 1

CLIENT SAMPLE NO.

224090-1

SRTW0330515G

b Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN002 07/17/03

Matrix: (soil/water) Potable Water Lab Sample ID: 0305470-001G

Sample wt/vol: (g/mL) ML Lab File ID: C1_194.RAW

Level: (low/med) LOW Date Received: 5/16/03

% Moisture: not dec. Date Extracted:

GC Column: C-18 ID: 46 (mm) Date Analyzed: 6/3/03

Extract Volume: _____ (µl) Dilution Factor: 1.00

Injection Volume: 400 (µl)

CONCENTRATION UNITS: (ug/L or ug/Kg)

CAS NO.	COMPOUND	µg/L	Q
1646-87-3	Aldicarb sulfoxide	1	U J
1646-88-4	Aldicarb sulfone	1	U
23135-22-0	Oxamyl	1	U
16752-77-5	Methomyl	1	U
16655-82-6	3-Hydroxycarbofuran	1	U
116-06-3	Aldicarb	1	U J
1563-66-2	Carbofuran	1	U
63-25-2	Carbaryl	1	U

07/17/03

FORM I VOA E531.1

STLN002 S37

Form 1

CLIENT SAMPLE NO.

224090-1

SRTW0330515G

b Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN002 07/17

Matrix: (soil/water) Potable Water Lab Sample ID: 0305470-001F

Sample wt/vol: (g/mL) ML Lab File ID: C1_136.RAW

Level: (low/med) LOW Date Received: 5/16/03

% Moisture: not dec. Date Extracted:

GC Column: K-CATION ID: 46 (mm) Date Analyzed: 5/30/03

Extract Volume: _____ (µl) Dilution Factor: 1.00

Injection Volume: 100 (µl)

CONCENTRATION UNITS: (ug/L or ug/Kg)

CAS NO.	COMPOUND	µg/L	Q
1071-83-6	Glyphosate	10	U J

07/17/03

FORM I VOA E547

IE

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

224090-1
SRTW0230515G

Lab Name: H2M LABS, INC. Contract: ____

Lab Code: 10478 Case No.: STL-NEWBUR SAS No.: ____ SDG No.: STLN002

Matrix: (soil/water) WATER Lab Sample ID: 0305470-001A

Sample wt/vol: (g/mL) Lab File ID: A00409.RAW

% Moisture: Decanted: (Y/N) N Date Received: 05/16/03

Extraction: (Type) Date Extracted: 05/22/03

Concentrated Extract Volume: (uL) Date Analyzed: 05/23/03

Injection Volume: 0.5 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(µg/L or µg/Kg) UG/L	Q
75-99-0	Dalapon	1.0	U J
1918-00-9	Dicamba	0.080	U
94-75-7	2,4-D	0.25	U
87-86-5	Pentachlorophenol	0.20	U
93-72-1	2,4,5-TP (Silvex)	0.13	U
88-85-7	Dinoseb	0.20	U
1918-02-1	Picloram	1.3	U

07/17/03

FORM I PEST OLM04.2

Form 1

CLIENT SAMPLE NO.

224090-1
SRTW0230515G

b Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN002

Matrix: (soil/water) Potable Water Lab Sample ID: 0305470-001H

Sample wt/vol: 250 (g/mL) ML Lab File ID: C2_069.RAW

Level: (low/med) LOW Date Received: 5/16/03

% Moisture: not dec. Date Extracted: 5/21/03

GC Column: PRP-1 ID: 46 (mm) Date Analyzed: 5/21/03

Extract Volume: 10000 (µl) Dilution Factor: 1.00

Injection Volume: 100 (µl)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) µg/L	Q
85-00-7	Diquat	1	U

07/17/03

FORM I VOA E549.1

STLN002 S39

LABORATORY TEST RESULTS

Job Number: 218853 Date: 07/31/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SR004A21204G
Date Sampled.....: 12/04/2002
Time Sampled.....: 17:45
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 218853-3
Date Received.....: 12/05/2002
Time Received.....: 12:20

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
SW846 8260B	Volatile Organics							
	Dichlorodifluoromethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Chloromethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Vinyl chloride	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Bromomethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Chloroethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Trichlorofluoromethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	1,1-Dichloroethene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Carbon disulfide	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Acetone	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Methylene chloride	0.50	U	U	0.50	ug/L	12/10/02	pcp
	trans-1,2-Dichloroethene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Methyl-tert-butyl-ether (MTBE)	1.0	U	U	1.0	ug/L	12/10/02	pcp
	1,1-Dichloroethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	cis-1,2-Dichloroethene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	2-Butanone (MEK)	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Chloroform	0.50	U	U	0.50	ug/L	12/10/02	pcp
	1,1,1-Trichloroethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Carbon tetrachloride	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Benzene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	1,2-Dichloroethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Trichloroethene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	1,2-Dichloropropane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Bromodichloromethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	cis-1,3-Dichloropropene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	4-Methyl-2-pentanone (MIBK)	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Toluene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	trans-1,3-Dichloropropene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	1,1,2-Trichloroethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Tetrachloroethene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	2-Hexanone	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Dibromochloromethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Chlorobenzene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Ethylbenzene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Styrene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Bromoform	0.50	U	U	0.50	ug/L	12/10/02	pcp
	1,1,2,2-Tetrachloroethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Xylenes (total)	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Freon 113	0.50	U	U	0.50	ug/L	12/10/02	pcp

* In Description = Dry Wgt.

LABORATORY TEST RESULTS

Job Number: 218853 Date: 07/31/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SR004A21204X
Date Sampled.....: 12/04/2002
Time Sampled.....: 17:45
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 218853-4
Date Received.....: 12/05/2002
Time Received.....: 12:20

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
SW846 8260B	Volatile Organics							
	Dichlorodifluoromethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Chloromethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Vinyl chloride	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Bromomethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Chloroethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Trichlorofluoromethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	1,1-Dichloroethene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Carbon disulfide	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Acetone	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Methylene chloride	0.50	U	U	0.50	ug/L	12/10/02	pcp
	trans-1,2-Dichloroethene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Methyl-tert-butyl-ether (MTBE)	1.0	U	U	1.0	ug/L	12/10/02	pcp
	1,1-Dichloroethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	cis-1,2-Dichloroethene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	2-Butanone (MEK)	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Chloroform	0.50	U	U	0.50	ug/L	12/10/02	pcp
	1,1,1-Trichloroethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Carbon tetrachloride	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Benzene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	1,2-Dichloroethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Trichloroethene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	1,2-Dichloropropane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Bromodichloromethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	cis-1,3-Dichloropropene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	4-Methyl-2-pentanone (MIBK)	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Toluene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	trans-1,3-Dichloropropene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	1,1,2-Trichloroethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Tetrachloroethene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	2-Hexanone	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Dibromochloromethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Chlorobenzene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Ethylbenzene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Styrene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Bromoform	0.50	U	U	0.50	ug/L	12/10/02	pcp
	1,1,2,2-Tetrachloroethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Xylenes (total)	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Freon 113	0.50	U	U	0.50	ug/L	12/10/02	pcp

* In Description = Dry Wgt.

LABORATORY TEST RESULTS

Job Number: 220400 Date:02/04/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SR004A30124G
Date Sampled.....: 01/24/2003
Time Sampled.....: 09:56
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 220400-1
Date Received.....: 01/24/2003
Time Received.....: 12:25

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	TDL	RL	DILUTION	UNITS	DT	DATE	TECH
EPA 200.7	Hardness by calculation Hardness, Total as CaCO3	263				2.50	1	mg/L		01/28/03	mad
EPA 200.7	Metals Analysis (ICP) Calcium (Ca) Magnesium (Mg)	55300 30300			123 6.8	500 500	1 1	ug/L ug/L		01/28/03 01/28/03	mad mad

* In Description = Dry Wgt.

Page 2

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SR04AD30304G

Lab Name: STL Newburgh Contract: 01003.10

Lab Code: 10142 Case No.: SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 221715-001

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: A8259.D

Level: (low/med) LOW Date Received: 3/5/2003

% Moisture: not dec. Date Analyzed: 3/6/2003

GC Column: RTX-502.2 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
1634-04-4	MTBE		U	0.5
71-43-2	Benzene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
108-38-3/106-42-	m,p-Xylene		U	0.5
95-47-6	o-Xylene		U	0.5
100-42-5	Styrene		U	0.5
98-82-8	Isopropylbenzene		U	0.5
103-65-1	n-Propylbenzene		U	0.5
108-67-8	1,3,5-Trimethylbenzene		U	0.5
98-06-6	tert-Butylbenzene		U	0.5
95-63-6	1,2,4-Trimethylbenzene		U	0.5
135-98-8	sec-Butylbenzene		U	0.5
99-87-6	p-Isopropyltoluene		U	0.5
541-73-1	1,3-Dichlorobenzene		U	0.5
106-46-7	1,4-Dichlorobenzene		U	0.5
104-51-8	n-Butylbenzene		U	0.5
95-50-1	1,2-Dichlorobenzene		U	0.5
120-82-1	1,2,4-Trichlorobenzene		U	0.5
91-20-3	Naphthalene		U	0.5
87-61-6	1,2,3-Trichlorobenzene		U	0.5
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
74-83-9	Bromomethane	0.5uJ	U	0.5
75-00-3	Chloroethane	0.5uJ	U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-09-2	Methylene Chloride		U	0.5
156-60-5	trans-1,2-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
590-20-7	2,2-Dichloropropane		U	0.5
67-66-3	Chloroform		U	0.5
74-97-5	Bromochloromethane		U	0.5
71-55-6	1,1,1-Trichloroethane	0.5uJ	U	0.5
563-58-6	1,1-Dichloropropene		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5

E. Dickinson 7/10/03

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 562-0890
Fax (845) 562-0841

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SR04AD30304G

Lab Name: STL Newburgh Contract: 01003.10

Lab Code: 10142 Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: 221715-001

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: A8259.D

Level: (low/med) LOW Date Received: 3/5/2003

% Moisture: not dec. _____ Date Analyzed: 3/6/2003

GC Column: RTX-502.2 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
106-93-4	1,2-Dichloroethane		U	0.5
79-01-6	Trichloroethene		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
75-27-4	Bromodichloromethane		U	0.5
74-95-3	Dibromomethane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
142-28-9	1,3-Dichloropropane		U	0.5
127-18-4	Tetrachloroethene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
106-93-4	1,2-Dibromoethane		U	0.5
79-34-5	1,1,1,2-Tetrachloroethane		U	0.5
75-25-2	Bromoform		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
96-18-4	1,2,3-Trichloropropane		U	0.5
108-86-1	Bromobenzene		U	0.5
95-49-8	2-Chlorotoluene		U	0.5
106-43-4	4-Chlorotoluene		U	0.5
96-12-8	1,2-Dibromo-3-chloropropane		U	0.5
87-68-3	Hexachlorobutadiene		U	0.5

LABORATORY TEST RESULTS

Job Number: 221715 Date: 03/12/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SR04AD30304G
Date Sampled.....: 03/04/2003
Time Sampled.....: 19:40
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 221715-1
Date Received.....: 03/05/2003
Time Received.....: 08:30

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	
EPA 504	GC Micro-Extractable Volatiles				-			
	1,2-Dibromoethane (EDB)	0.020	U		0.020	ug/L	03/10/03	sm
	1,2-Dibromo-3-chloropropane	0.020	U		0.020	ug/L	03/10/03	sm

* In Description = Dry Wgt.

000139

LABORATORY TEST RESULTS

Job Number: 221715 Date:03/26/2003

CUSTOMER: Groundwater Sciences PROJECT: D1003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SR04AD30304G
Date Sampled.....: 03/04/2003
Time Sampled.....: 19:40
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 221715-1
Date Received.....: 03/05/2003
Time Received.....: 08:30

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	ID.	RL	DILUTION	UNITS	DT	DATE	TECH
SM18 3113B	Antimony (Sb)	1.9	U	U	1.9	3.0	1	ug/L		03/10/03	mah
SM18 3113B	Selenium (Se)	1.4	U	U	1.4	5.0	1	ug/L		03/11/03	mah
EPA 245.1	Mercury (Hg)	0.20	U		0.20	0.20	1	ug/L		03/07/03	lms
EPA 200.9	Metals Analysis (GFAA)										
	Thallium (Tl)	1.0	U	U	1.0	1.5	1	ug/L		03/09/03	mah
EPA 200.7	Metals Analysis (ICP)										
	Arsenic (As)	3.2	U		3.2	5.0	1	ug/L		03/07/03	mad
	Barium (Ba)	152			0.50	150	1	ug/L		03/07/03	mad
	Beryllium (Be)	0.40	U		0.40	1.0	1	ug/L		03/07/03	mad
	Cadmium (Cd)	0.30	U		0.30	2.0	1	ug/L		03/07/03	mad
	Chromium (Cr)	1.2	U		1.2	10.0	1	ug/L		03/07/03	mad
	Iron (Fe)	89.6			5.0	60.0	1	ug/L		03/07/03	mad
	Manganese (Mn)	653			1.3	10.0	1	ug/L		03/07/03	mad
	Nickel (Ni)	2.4	U		2.4	10.0	1	ug/L		03/07/03	mad
	Silver (Ag)	2.5	U		2.5	10.0	1	ug/L		03/07/03	mad
	Sodium (Na)	4970			212	200	1	ug/L		03/07/03	mad
	Zinc (Zn)	1.9	U		1.9	20.0	1	ug/L		03/07/03	mad

UJ UJ UJ
CaEnkerson 7/16/03

* In Description = Dry Wgt.

LABORATORY TEST RESULTS

Job Number: 221715 Date: 03/27/2003

CUSTOMER: Groundwater Sciences PROJECT: D1003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SR04AD30304G
Date Sampled.....: 03/04/2003
Time Sampled.....: 19:40
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 221715-1
Date Received.....: 03/05/2003
Time Received.....: 08:30

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
SM18 9223	E. Coliform Count	1.00	U		1.00	MPN/100ml	03/05/03	mam
SM18 9223	Total Coliform Count	1.00	U		1.00	MPN/100ml	03/05/03	mam
SM18 2120B	Color	5.0			2.5	Pt/Co	03/05/03	mam
SM18 2150B	Odor	1			1	T.O.N.	03/05/03	mam
SM18 4500Cl	Chloride	5.2			5.0	mg/L	03/10/03	mam
SM18 4500CNE	Cyanide, Total	0.0100	U		0.0100	mg/L	03/07/03	nmd
SM18 4500NO2B	Nitrite as N (NO2-N)	0.01		UJ	0.01	mg/L	03/05/03	nmd
EPA 300.0	Ion Chromatography Analysis							
	Fluoride	0.500	U		0.500	mg/L	03/05/03	bg
	Nitrate as N (NO3-N)	0.500	U		0.500	mg/L	03/05/03	bg
	Sulfate	21.4			5.00	mg/L	03/05/03	bg

CaEnkerson 7/16/03

* In Description = Dry Wgt.

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000140

SEVERN TRENT STL
NYSDOH 10142 NJDEP 73015 CTDOHS PH-0554 EPA NY049 PA 68-378 M-NY049
STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 562-0890
Fax (845) 562-0841

Environmental Health Laboratories
Sample Result Record Sheet

Sample Matrix: DW
Acquisition File: Not Available
Data Directory: 031103a
Instrument: GC/MS - T
Extracted Date: 03/10/2003
Sample Number: 857948
Dilution Factor: 10
Sample Site: 221715-1
Sample Location: SR Newburgh SR04AD30304G Shena

Method: 548.1
Calibration File: m-548 1-t-031003.mth
Analysis Date: 03/11/2003
Analysis Time: 12:48
Analyst: werbians
Results Submitted By: werbians
Run Number: 52275

Sample Quality Control

Internal Standards Parameter	Area	CCC Area	CCC % Resp	CCC Area Limits Lwr	CCC Area Limits Upr	CCC Pass / Fail	IC Avg Area	IC % Resp	IC Area Limits Lwr	IC Area Limits Upr	IC Pass / Fail
IS-4,4'-Dibromooctafluorobiphenyl	72401	61477	118	70	130	PASS	Not Found	N/A	N/A	N/A	N/A

Surrogate Standards Parameter	Amount	Units	Target	%Rec	Limits Lower	Limits Upper	Pass/Fail
SS-2,4-Dichlorophenylacetic acid	494.753	ug/L	50	99	70	130	PASS

Ordered Parameter Results

Parameter	Amount	MRL	Units
Endothall	< 9.0	9.0	ug/L

Additional Found Parameters

Parameter	Amount	MRL	Units

The symbol * in the Amount column above indicates that the sample was re-analyzed for that parameter and the results are presented on another page.

SEVERN TRENT STL

Doug Tawse
STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550

March 28, 2003

Dear Doug:

Please find enclosed results for three (3) samples, Billing Ref: Shenandoah, STL Job #205996, which you submitted for asbestos analysis by Transmission Electron Microscopy (TEM).

The results are listed according to the NYELAP Certification Manual and USEPA Phase II Primary and Secondary Drinking Water Regulations EPA Method 100.2 ("<" is equal to the value of the detection limit).

CLIENT SAMPLE ID	A (million fibers/liter)	DATE FILTERED	DATE ANALYZED
221570-1	<0.178	03/04/03; 11:25	03/28/03; 10:40
221715-1 SR04AD30304G	<0.178	03/06/03; 11:41	03/28/03; 11:00
221992-1	<0.195	03/13/03; 11:18	03/28/03; 11:59

The final maximum contaminant level goal (MCLG) and maximum contaminant level (MCL) for asbestos in water is 7.0 Million fibers/liter.

STL Billerica is accredited by NYELAP (#10838) and the Commonwealth of Massachusetts (#M-MA038) for asbestos analysis of water samples

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted above.

Severn Trent Laboratories is not responsible for incorrect sampling procedures since these water samples were not collected by our lab personnel. STL is only responsible for the analysis and reporting of submitted samples. Accreditation in no way constitutes or implies product certification, approval, or endorsement by NELAC. This report relates only to the specific samples tested herein. The enclosed report shall not be reproduced except in full, without the written approval of STL.

Should you have further questions, or need additional information, please feel free to contact Client Services or me at any time.

Sincerely,

Ernest T. Dobi

Ernest T. Dobi, Ph.D.
Manager-Microscopy Service

Severn Trent Laboratories, Inc.
STL Billerica • 149 Rangeway Road, North Billerica, MA 01862
Tel 978 667 1400 Fax 978 667 7871 • www.stl-inc.com

A part of Severn Trent plc

Hazen Research, Inc.
4601 Indiana Street
Golden, CO 80403 USA
Tel: (303) 279-4501
Fax: (303) 278-1528

DATE	March 25, 2003
HRI PROJECT	002-CE7
HRI SERIES NO.	C068/03
DATE REC'D	03/06/2003
CUST. P.O.#	3-06

STL Newburgh
D. Tause
315 Fullerton Avenue
Newburgh, NY 12550

REPORT OF ANALYSIS

SAMPLE NO. C068/03-1

SAMPLE IDENTIFICATION: 221715-1 - SR04AD30304G - Shenandoah - sampled on 03/04/2003 @ 1940

PARAMETER	RESULT	DETECTION LIMIT	METHOD	ANALYSIS DATE	ANALYST
Radon (+-Precision*), pCi/l (T)	230(+-20)	14	SM 7500-Rn B	03/06/2003 @ 1836	MRA

*Variability of the radioactive decay process (counting error) at the 95% confidence level, 1.96 sigma.
Certification ID's: CO/EPA - CO00008; CT - PH-0152; KY - 90076; KS - E-10265; NH - 232801-A;
NY ELAP - 11417; PA DEP 68551; WI - 998376610

CODES:
(T) = Total (D) = Dissolved
(S) = Suspended (R) = Total Recoverable
(PD) = Potentially Dissolved
< = Less Than

By: Robert Rostad
Laboratory Manager

An Employee-Owned Company

STL ST. LOUIS

STL NEWBURGH

Client Sample ID: SR04AD30304G

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F3C140360-002
Work Order: FJ7WX
Matrix: WATER

Date Collected: 03/04/03 1940
Date Received: 03/14/03 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
GROSS A/B BY GFPC EPA 900.0 MOD				pCi/L	900.0 MOD			
Gross Alpha	4.0		2.6	3.6	03/18/03	03/22/03	3078224	
Gross Beta	~~3.2~~ 3.9	U	2.4	3.9	03/18/03	03/22/03	3078224	
RA-226 BY EPA-903.0 MOD				pCi/L	903.0 MOD			
Radium (226)	0.23	U	0.17	0.23	03/25/03	04/11/03	3084253	56
RA-228 BY GFPC EPA 904 MOD				pCi/L	904 MOD			
Radium 228	1.14		0.70	1.1	03/25/03	04/11/03	3084254	54

DAS 7/20/03

NOTE(S)
Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Bold results are greater than the MDC
U Result is less than the sample detection limit.

LOT# F3C140360

STL NEWBURGH

Client Sample ID: SR04AD30304G

Trace Level Organic Compounds

Lot-Sample #...: G3C140254-002 Work Order #...: FJ65V1AA Matrix.....: WATER
Date Sampled...: 03/04/03 Date Received..: 03/14/03
Prep Date.....: 03/17/03 Analysis Date..: 03/20/03
Prep Batch #...: 3076561
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	5.0	pg/L	EPA-5 1613B-Tetra

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	271 *	(25 - 141)

NOTE(S):

* Surrogate recovery is outside stated control limits.

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

221715-1
SR04AD303 04G

Lab Name: H2M LABS, INC. Contract: ____

Lab Code: 10478 Case No.: STL-NEWBU SAS No.: _____ SDG No.: STLN001

Matrix: (soil/water) WATER Lab Sample ID: 0303128-001B

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 3A\N2605.D

Level: (low/med) LOW Date Received: 03/06/03

% Moisture: Decanted: (Y/N) N Date Extracted: 03/11/03

Concentrated Extract Volume: 1000 (µL) Date Analyzed: 03/14/03

Injection Volume: 1 (µL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) SPE

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(µg/L or µg/Kg) UG/L	Q
77-47-4	Hexachlorocyclopentadiene	0.6	U
1918-16-7	Propachlor	1	U
118-74-1	Hexachlorobenzene	0.3	U J
122-34-9	Simazine	0.5	U J
1912-24-9	Atrazine	0.5	U
21087-64-9	Metribuzin	0.5	U
15972-60-8	Alachlor	1	U J
51218-45-2	Metolachlor	1	U J
23184-66-9	Butachlor	1	U
103-23-1	bis(2-Ethylhexyl)adipate	1	U J
117-81-7	Bis(2-ethylhexyl)phthalate	3	U
50-32-8	Benzo(a)pyrene	0.1	U J

FORM I SV- 1 OLM04.2

Form 1

CLIENT SAMPLE NO.

221715-1
SR04AD30304G

ab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN001 mc 07/04/03

Matrix: (soil/water) Potable Water Lab Sample ID: 0303128-001C

Sample wt/vol: 35 (g/mL) ML Lab File ID: B00117.RAW

Level: (low/med) LOW Date Received: 3/6/03

% Moisture: not dec. Date Extracted: 3/7/03

GC Column: R-35 ID: .53 (mm) Date Analyzed: 3/11/03

Extract Volume: 2000 (µl) Dilution Factor: 1.00

Injection Volume: 1 (µl)

CONCENTRATION UNITS:

CAS NO.	COMPOUND (ug/L or ug/Kg)	µg/L	Q
309-00-2	Aldrin	0.03	U
58-89-9	Lindane	0.03	U
76-44-8	Heptachlor	0.03	U
57-74-9	Chlordane	0.5	U
1024-57-3	Heptachlor epoxide	0.03	U
	Total PCBs	0.5	U
60-57-1	Dieldrin	0.05	U
72-20-8	Endrin	0.05	U
72-43-5	Methoxychlor	0.3	U
8001-35-2	Toxaphene	3	U

FORM I VOA E505

Form 1

CLIENT SAMPLE NO.

221715-1
SR04AD30304G

ab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN001 mc 07/

Matrix: (soil/water) Potable Water Lab Sample ID: 0303128-001E

Sample wt/vol: (g/mL) ML Lab File ID: C1-022.RAW

Level: (low/med) LOW Date Received: 3/6/03

% Moisture: not dec. Date Extracted:

GC Column: C-18 ID: 46 (mm) Date Analyzed: 3/15/03

Extract Volume: _____ (µl) Dilution Factor: 1.00

Injection Volume: 400 (µl)

CONCENTRATION UNITS:

CAS NO.	COMPOUND (ug/L or ug/Kg)	µg/L	Q
1646-87-3	Aldicarb sulfoxide	1	U
1646-88-4	Aldicarb sulfone	1	U
23135-22-0	Oxamyl	1	U
16752-77-5	Methomyl	1	U
16655-82-6	3-Hydroxycarbofuran	1	U
116-06-3	Aldicarb	1	U
1563-66-2	Carbofuran	1	U
63-25-2	Carbaryl	1	U

FORM I VOA E531.1

STLN001 S47

Form 1

CLIENT SAMPLE NO.

221715-1

SR04AD30304G

07/04/03

Lab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN001

Matrix: (soil/water) Potable Water Lab Sample ID: 0303128-001F

Sample wt/vol: (g/mL) ML Lab File ID: C1-059.RAW

Level: (low/med) LOW Date Received: 3/6/03

% Moisture: not dec. Date Extracted:

GC Column: ID: (mm) Date Analyzed: 3/16/03

Extract Volume: _____ (µl) Dilution Factor: 1.00

Injection Volume: 100 (µl)

CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L

CAS NO.	COMPOUND	µg/L	Q
1071-83-6	Glyphosate	10	U

FORM I VOA

E547

STLN001 S49

Form 1

CLIENT SAMPLE NO.

221715-1

SR04AD30304

07/

Lab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN001

Matrix: (soil/water) Potable Water Lab Sample ID: 0303128-001G

Sample wt/vol: 250 (g/mL) ML Lab File ID: C2-074.RAW

Level: (low/med) LOW Date Received: 3/6/03

% Moisture: not dec. Date Extracted: 3/7/03

GC Column: PRP-1 ID: 4.1 (mm) Date Analyzed: 3/26/03

Extract Volume: 10000 (µl) Dilution Factor: 1.00

Injection Volume: 100 (µl)

CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L

CAS NO.	COMPOUND	µg/L	Q
85-00-7	Diquat	1	U

FORM I VOA

E549.1

LABORATORY TEST RESULTS

Job Number: 224327 Date: 06/13/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203.SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SPTW0430522G
Date Sampled.....: 05/22/2003
Time Sampled.....: 15:40
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 224327-2
Date Received.....: 05/22/2003
Time Received.....: 17:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
SW846 5030(5mL	Sample Preparation	Complete				Text	05/30/03	pcp
EPA 524.2	Volatile Organics							
	Dichlorodifluoromethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Chloromethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Vinyl chloride	0.50	U		0.50	ug/L	05/24/03	pcp
	Bromomethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Chloroethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Trichlorofluoromethane	0.50	U		0.50	ug/L	05/24/03	pcp
	1,1-Dichloroethene	0.50	U		0.50	ug/L	05/24/03	pcp
	Methylene chloride	0.54	J		1.0	ug/L	05/24/03	pcp
	trans-1,2-Dichloroethene	0.50	U		0.50	ug/L	05/24/03	pcp
	Methyl-tert-butyl-ether (MTBE)	0.50	U		0.50	ug/L	05/24/03	pcp
	1,1-Dichloroethane	0.50	U		0.50	ug/L	05/24/03	pcp
	2,2-Dichloropropane	0.50	U		0.50	ug/L	05/24/03	pcp
	cis-1,2-Dichloroethene	0.50	U		0.50	ug/L	05/24/03	pcp
	Bromochloromethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Chloroform	0.50	U		0.50	ug/L	05/24/03	pcp
	1,1,1-Trichloroethane	0.50	U		0.50	ug/L	05/24/03	pcp
	1,1-Dichloropropene	0.50	U		0.50	ug/L	05/24/03	pcp
	Carbon tetrachloride	0.50	U		0.50	ug/L	05/24/03	pcp
	Benzene	0.50	U		0.50	ug/L	05/24/03	pcp
	1,2-Dichloroethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Trichloroethene	0.50	U		0.50	ug/L	05/24/03	pcp
	1,2-Dichloropropane	0.50	U		0.50	ug/L	05/24/03	pcp
	Dibromomethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Bromodichloromethane	0.50	U		0.50	ug/L	05/24/03	pcp
	cis-1,3-Dichloropropene	0.50	U		0.50	ug/L	05/24/03	pcp
	Toluene	0.50	U		0.50	ug/L	05/24/03	pcp
	trans-1,3-Dichloropropene	0.50	U		0.50	ug/L	05/24/03	pcp
	1,1,2-Trichloroethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Tetrachloroethene	0.50	U		0.50	ug/L	05/24/03	pcp
	1,3-Dichloropropane	0.50	U		0.50	ug/L	05/24/03	pcp
	Dibromochloromethane	0.50	U		0.50	ug/L	05/24/03	pcp
	1,2-Dibromoethane (EDB)	0.50	U		0.50	ug/L	05/24/03	pcp
	Chlorobenzene	0.50	U		0.50	ug/L	05/24/03	pcp
	1,1,1,2-Tetrachloroethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Ethylbenzene	0.50	U		0.50	ug/L	05/24/03	pcp
	m&p-Xylenes	0.50	U		0.50	ug/L	05/24/03	pcp
	o-Xylene	0.50	U		0.50	ug/L	05/24/03	pcp
	Styrene	0.50	U		0.50	ug/L	05/24/03	pcp
	Bromoform	0.50	U		0.50	ug/L	05/24/03	pcp
	Isopropylbenzene	0.50	U		0.50	ug/L	05/24/03	pcp
	1,1,2,2-Tetrachloroethane	0.50	U		0.50	ug/L	05/24/03	pcp
	Bromobenzene	0.50	U		0.50	ug/L	05/24/03	pcp
	1,2,3-Trichloropropane	0.50	U		0.50	ug/L	05/24/03	pcp
	n-Propylbenzene	0.50	U		0.50	ug/L	05/24/03	pcp
	2-Chlorotoluene	0.50	U		0.50	ug/L	05/24/03	pcp

* In Description = Dry Wgt.

STL Newburgh is a part of Severn Trent Laboratories, Inc.

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 562-0890

SEVERN TRENT STL
NYSDOH 10142 NJDEP 73015 CTDOHS PH-0554 EPA NY049 PA 68-378 M-NY049

LABORATORY TEST RESULTS

Job Number: 224327 Date: 06/13/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203.SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SPTW0430522G
Date Sampled.....: 05/22/2003
Time Sampled.....: 15:40
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 224327-2
Date Received.....: 05/22/2003
Time Received.....: 17:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TE
	1,3,5-Trimethylbenzene	0.50	U		0.50	ug/L	05/24/03	pc
	4-Chlorotoluene	0.50	U		0.50	ug/L	05/24/03	pc
	tert-Butylbenzene	0.50	U		0.50	ug/L	05/24/03	pc
	1,2,4-Trimethylbenzene	0.50	U		0.50	ug/L	05/24/03	pc
	sec-Butylbenzene	0.50	U		0.50	ug/L	05/24/03	pc
	1,3-Dichlorobenzene	0.50	U		0.50	ug/L	05/24/03	pc
	p-Isopropyltoluene	0.50	U		0.50	ug/L	05/24/03	pc
	1,4-Dichlorobenzene	0.50	U		0.50	ug/L	05/24/03	pc
	n-Butylbenzene	0.50	U		0.50	ug/L	05/24/03	pc
	1,2-Dichlorobenzene	0.50	U		0.50	ug/L	05/24/03	pcp
	1,2-Dibromo-3-chloropropane	0.50	U		0.50	ug/L	05/24/03	pcp
	1,2,4-Trichlorobenzene	0.50	U		0.50	ug/L	05/24/03	pcp
	Hexachlorobutadiene	0.50	U		0.50	ug/L	05/24/03	pcp
	Naphthalene	0.50	U		0.50	ug/L	05/24/03	pcp
	1,2,3-Trichlorobenzene	0.50	U		0.50	ug/L	05/24/03	pcp
	tert-Butyl alcohol	~~5.0~~	~~U~~	R	5.0	ug/L	05/24/03	pcp

em 07/15/03

* In Description = Dry Wgt.

STL Newburgh is a part of Severn Trent Laboratories, Inc.

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550

SEVERN TRENT STL
NYSDOH 10142 NJDEP 73015 CTDOHS PH-0554 EPA NY049

LABORATORY TEST RESULTS

Job Number: 224327 Date: 06/02/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SMEN ATTN: Dorothy Bergmann

Customer Sample ID: SPTW0430522G
Date Sampled.....: 05/22/2003
Time Sampled.....: 15:40
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 224327-2
Date Received.....: 05/22/2003
Time Received.....: 17:45

TEST METHOD	PARAMETER/TEST DESCRIPTION*	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
EPA 504	GC Micro-Extractable Volatiles							
	1,2-Dibromoethane (EDB)	0.020	U		0.020	ug/L	05/27/03	smo
	1,2-Dibromo-3-chloropropane	0.020	U		0.020	ug/L	05/27/03	smo

* In Description = Dry Wgt.

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000119

SEVERN TRENT STL
NYSDOH 10142 NJDEP 73015 CTDOHS PH-0554 EPA NY049 PA 68-378 M-NY049
STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 562-0890

LABORATORY TEST RESULTS

Job Number: 224327 Date:06/26/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SMEN ATTN: Dorothy Bergmann

Customer Sample ID: SPTW0430522G
Date Sampled.....: 05/22/2003
Time Sampled.....: 15:40
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 224327-2
Date Received.....: 05/22/2003
Time Received.....: 17:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	IDL	RL	DILUTION	UNITS	DT	DATE	TECH
SM18 3113B	Antimony (Sb)	1.3	~~U~~	~~U~~ UJ	1.3	3.0	1	ug/L		06/06/03	mwh
SM18 3113B	Antimony (Sb), Diss.	1.3	~~U~~	~~U~~ UJ	1.3	3.0	1	ug/L		06/06/03	mwh
SM18 3113B	Selenium (Se)	1.4	U		1.4	5.0	1	ug/L		06/02/03	mwh
SM18 3113B	Selenium (Se), Diss.	1.4	U		1.4	5.0	1	ug/L		06/02/03	mwh
EPA 245.1	Mercury (Hg)	0.20	U		0.20	0.20	1	ug/L		05/27/03	lms
EPA 245.1	Mercury (Hg), Diss.	0.20	U		0.20	0.20	1	ug/L		05/27/03	lms
EPA 200.9	Metals Analysis (GFAA)										
	Thallium (Tl)	1.6	U		1.6	1.5	1	ug/L		05/28/03	mwh
	Thallium (Tl), Diss.	1.6	U	~~U~~	1.6	1.5	1	ug/L		05/28/03	mwh
EPA 200.7	Metals Analysis (ICP)										
	Arsenic (As)	2.4	U		2.4	5.0	1	ug/L		06/06/03	mad
	Arsenic (As), Diss.	2.4	U		2.4	10.0	1	ug/L		06/06/03	mad
	Barium (Ba)	141	~~B~~		4.7	150	1	ug/L		06/04/03	mad
	Barium (Ba), Diss.	151	~~B~~		4.7	200	1	ug/L		06/04/03	mad
	Beryllium (Be)	0.20	~~U~~	UJ	0.20	1.0	1	ug/L		06/04/03	mad
	Beryllium (Be), Diss.	0.20	~~U~~	UJ	0.20	5.0	1	ug/L		06/04/03	mad
	Cadmium (Cd)	0.30	~~U~~	UJ	0.30	2.0	1	ug/L		06/04/03	mad
	Cadmium (Cd), Diss.	0.30	~~U~~	UJ	0.30	5.0	1	ug/L		06/04/03	mad
	Chromium (Cr)	3.2	~~B~~	J	0.70	10.0	1	ug/L		06/04/03	mad
	Chromium (Cr), Diss.	4.1	~~B~~	J	0.70	10.0	1	ug/L		06/04/03	mad
	Iron (Fe)	47.0	U		47.0	60.0	1	ug/L		06/04/03	mad

CAEnikson 7/22/03

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 224327 Date:06/26/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SPTW0430522G
Date Sampled.....: 05/22/2003
Time Sampled.....: 15:40
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 224327-2
Date Received.....: 05/22/2003
Time Received.....: 17:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	TDL	RL	DILUTION	UNITS	BY	DATE	TECH
	Iron (Fe), Diss.	47.0	U		47.0	60.0	1	ug/L		06/04/03	mad
	Manganese (Mn)	636			0.60	10.0	1	ug/L		06/04/03	mad
	Manganese (Mn), Diss.	681			0.60	10.0	1	ug/L		06/04/03	mad
	Nickel (Ni)	1.2		UJ	1.2	10.0	1	ug/L		06/04/03	mad
	Nickel (Ni), Diss.	1.2		UJ	1.2	40.0	1	ug/L		06/04/03	mad
	Silver (Ag)	1.8		UJ	1.8	10.0	1	ug/L		06/04/03	mad
	Silver (Ag), Diss.	1.8		UJ	1.8	10.0	1	ug/L		06/04/03	mad
	Sodium (Na)	5260			138	200	1	ug/L		06/04/03	mad
	Sodium (Na), Diss.	5430			138	500	1	ug/L		06/04/03	mad
	Zinc (Zn)	6.3		J	2.9	20.0	1	ug/L		06/04/03	mad
	Zinc (Zn), Diss.	2.9		UJ	2.9	20.0	1	ug/L		06/04/03	mad

CAEnikson 7/22/03

* In Description = Dry Wgt.

Page 5

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Environmental Health Laboratories
Sample Result Record Sheet

Sample Matrix: DW
Acquisition File: Not Available
Data Directory: 052703a
Instrument: GC/MS - T
Extracted Date: 05/27/2003
Sample Number: 890576
Dilution Factor: 10
Sample Site: 224327-2 SPTW0430522G
Sample Location: SPTW040522G ECD 7/18/03

Method: 548.1
Calibration File: m-548 1-t-042403.mth
Analysis Date: 05/27/2003
Analysis Time: 21:09
Analyst: werbians
Results Submitted By: werbians
Run Number: 54601

Sample Quality Control

Internal Standards Parameter	Area	CCC Area	CCC % Resp	CCC Area Limits Lwr	CCC Area Limits Upr	CCC Pass / Fail	IC Avg Area	IC % Resp	IC Area Limits Lwr	IC Area Limits Upr	IC Pass / Fail
IS-4,4'-Dibromooctafluorobiphenyl	87381	71874	122	70	130	PASS	Not Found	N/A	N/A	N/A	N/A

Surrogate Standards Parameter	Amount	Units	Target	%Rec	Limits Lower	Limits Upper	Pass/Fail
SS-2,4-Dichlorophenylacetic acid	428.503	ug/L	50	86	70	130	PASS

Ordered Parameter Results

Parameter	Amount	MRL	Units
Endothall	< 9.0	9.0	ug/L

Additional Found Parameters

Parameter	Amount	MRL	Units

The symbol * in the Amount column above indicates that the sample was re-analyzed for that parameter and the results are presented on another page.

SEVERN TRENT STL

Doug Tawse
STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550

June 6, 2003

Dear Doug:

Please find enclosed results for three (3) samples, Billing Ref: Shanandoah, STL Job #207275, which you submitted for asbestos analysis by Transmission Electron Microscopy (TEM).

The results are listed according to the NYELAP Certification Manual and USEPA Phase II Primary and Secondary Drinking Water Regulations EPA Method 100.2 ("<" is equal to the value of the detection limit).

CLIENT SAMPLE ID	A (million fibers/liter)	DATE FILTERED	DATE ANALYZED
224090-1	<0.177	05/16/03; 10:48	06/06/03; 14:20
224327-1	<0.177	05/23/03; 11:11	06/06/03; 14:42
224327-2 SPTW0430522G	<0.177	05/23/03; 11:17	06/06/03; 15:03

The final maximum contaminant level goal (MCLG) and maximum contaminant level (MCL) for asbestos in water is 7.0 Million fibers/liter.

STL Billerica is accredited by NYELAP (#10838) and the Commonwealth of Massachusetts (#M-MA038) for asbestos analysis of water samples

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted above.

Severn Trent Laboratories is not responsible for incorrect sampling procedures since these water samples were not collected by our lab personnel. STL is only responsible for the analysis and reporting of submitted samples. Accreditation in no way constitutes or implies product certification, approval, or endorsement by NELAC. This report relates only to the specific samples tested herein. The enclosed report shall not be reproduced except in full, without the written approval of STL.

Should you have further questions, or need additional information, please feel free to contact Client Services or me at any time.

Sincerely,

Ernest T. Dobi

Ernest T. Dobi, Ph.D.
Manager-Microscopy Service

Severn Trent Laboratories, Inc.
STL Billerica • 149 Rangeway Road, North Billerica, MA 01862
Tel 978 667 1400 Fax 978 667 7871 • www.stl-inc.com

A part of Severn Trent plc

HAZEN
Hazen Research, Inc.
4601 Indiana Street
Golden, CO 80403 USA
Tel: (303) 279-4501
Fax: (303) 278-1528

DATE	June 12, 2003
HRI PROJECT	002-DF3
HRI SERIES NO.	E460/03
DATE REC'D	05/23/2003
CUST. P.O.#	05-18

STL Newburgh
D. Tause
315 Fullerton Avenue
Newburgh, NY 12550

REPORT OF ANALYSIS

SAMPLE NO. E460/03-2

SAMPLE IDENTIFICATION: 224327-2 - SPTW0430522G - Shenandoah - sampled on 05/22/2003 @ 1540

PARAMETER	RESULT	DETECTION LIMIT	METHOD	ANALYSIS DATE	ANALYS
Radon (+-Precision*), pCi/l (T)	210(+-20)	14	SM 7500-Rn B	05/23/2003 @ 1542	MRA

*Variability of the radioactive decay process (counting error) at the 95% confidence level, 1.96 sigma.
Certification ID's: CO/EPA - CO00008; CT - PH-0152; KY - 90076; KS - E-10265; NH - 232801-A; NY ELAP - 11417; PA DEP 68551; WI - 998376610

CODES:
(T) = Total (D) = Dissolved
(S) = Suspended (R) = Total Recoverable
(PD) = Potentially Dissolved
< = Less Than

By:
Robert Rostad
Laboratory Manager

An Employee-Owned Company

STL ST. LOUIS

STL NEWBURGH

Client Sample ID: 224327-2 SPTW04305226

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F3E230213-003
Work Order: FPA2M
Matrix: WATER

Date Collected: 05/22/03 1540
Date Received: 05/23/03 0900

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
GROSS A/B BY GFPC EPA 900.0 MOD				pCi/L	900.0 MOD			
Gross Alpha	2.8	J	1.7	2.2	06/16/03	06/19/03	3167313	
Gross Beta	3.2	J	1.2	1.9	06/16/03	06/19/03	3167313	
RA-226 BY EPA-903.0 MOD				pCi/L	903.0 MOD			
Radium (226)	0.18	J	0.10	0.13	05/27/03	06/11/03	3147208	100
RA-228 BY GFPC EPA 904 MOD				pCi/L	904 MOD			
Radium 228	~~0.41~~ 0.63	U	0.39	0.63	05/27/03	06/11/03	3147209	96

DAS 7/21/03

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

U Result is less than the sample detection limit.

LOT# F3E230213

STL NEWBURGH

Client Sample ID: SPTW04305226

Trace Level Organic Compounds

Lot-Sample #...: G3E230368-003 Work Order #...: FPC7N1AA Matrix.....: WATER
Date Sampled...: 05/22/03 Date Received..: 05/23/03
Prep Date.....: 05/31/03 Analysis Date..: 06/01/03
Prep Batch #...: 3151166
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	5.0	pg/L	EPA-5 1613B-Tetra

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	86	(25 - 141)

LABORATORY TEST RESULTS

Job Number: 224327 Date: 06/26/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SPTW0430522G
Date Sampled.....: 05/22/2003
Time Sampled.....: 15:40
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 224327-2
Date Received.....: 05/22/2003
Time Received.....: 17:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
SM18 9223	E. Coliform Count	1.00	U		1.00	MPN/100ml	05/23/03	mam
SM18 9223	Total Coliform Count	1.00	U		1.00	MPN/100ml	05/23/03	mam
SM18 2120B	Color	5.0			2.5	Pt/Co	05/23/03	mam
SM18 2150B	Odor	1			1	T.O.N.	05/23/03	mam
SM18 4500Cl	Chloride	14.1			5.0	mg/L	05/27/03	mam
SM18 4500CNE	Cyanide, Total	0.0100	U		0.0100	mg/L	05/27/03	nmd
SM18 4500NO2B	Nitrite as N (NO2-N)	0.01	U		0.01	mg/L	05/23/03	nmd
EPA 300.0	Ion Chromatography Analysis							
	Fluoride	0.500	U		0.500	mg/L	05/23/03	rmc
	Nitrate as N (NO3-N)	0.500	U		0.500	mg/L	05/23/03	rmc
	Sulfate	22.1			5.00	mg/L	05/23/03	rmc

* In Description = Dry Wgt.

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SEVERN TRENT STL

NYSDOH 10142 NJDEP 73015 CTDOHS PH-0554 EPA NY049 PA 68-378 M-NY049

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 562-0890

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

224327-2
SPTW0430522G

Lab Name: H2M LABS, INC. Contract: ____

Lab Code: 10478 Case No.: STL-NEWBU SAS No.: _____ SDG No.: STLN002

Matrix: (soil/water) WATER Lab Sample ID: 0305665-002B

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 3A\N3366.D

Level: (low/med) LOW Date Received: 05/23/03

% Moisture: Decanted: (Y/N) N Date Extracted: 05/30/03

Concentrated Extract Volume: 1000 (µL) Date Analyzed: 06/03/03

Injection Volume: 1 (µL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) SPE

CONCENTRATION UNITS: (µg/L or µg/Kg) UG/L

CAS NO.	COMPOUND		Q
77-47-4	Hexachlorocyclopentadiene	0.6	U J
1918-16-7	Propachlor	1	U J
118-74-1	Hexachlorobenzene	0.3	U J
122-34-9	Simazine	0.5	U J
1912-24-9	Atrazine	0.5	U J
21087-64-9	Metribuzin	0.5	U J
15972-60-8	Alachlor	1	U J
51218-45-2	Metolachlor	1	U J
23184-66-9	Butachlor	1	U J
103-23-1	bis(2-Ethylhexyl)adipate	1	U J
117-81-7	Bis(2-ethylhexyl)phthalate	~~0.6~~ 3	~~BJ~~ J
50-32-8	Benzo(a)pyrene	0.1	U J

07/17/03

SAS COUN LLS

Form 1

CLIENT SAMPLE NO.

224327-2

SPTW043052 2G

07/17/03

Lab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN002

Matrix: (soil/water) Potable Water Lab Sample ID: 0305665-002C

Sample wt/vol: 35 (g/mL) ML Lab File ID: B00503.RAW

Level: (low/med) LOW Date Received: 5/23/03

% Moisture: not dec. Date Extracted: 5/30/03

GC Column: R-35 ID: .53 (mm) Date Analyzed: 5/31/03

Extract Volume: 2000 (µl) Dilution Factor: 1.00

Injection Volume: 1 (µl)

CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L

CAS NO.	COMPOUND	µg/L	Q
309-00-2	Aldrin	0.03	U J
58-89-9	Lindane	0.03	U J
76-44-8	Heptachlor	0.03	U J
57-74-9	Chlordane	0.5	U J
1024-57-3	Heptachlor epoxide	0.03	U J
	Total PCBs	0.5	U J
60-57-1	Dieldrin	0.05	U J
72-20-8	Endrin	0.05	U J
72-43-5	Methoxychlor	0.3	U J
8001-35-2	Toxaphene	3	U J

07/17/03

FORM I VOA E505

STLN002 S49

Form 1

CLIENT SAMPLE NO.

224327-2

SPTW043052 2G

Lab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN002 07/17

Matrix: (soil/water) Potable Water Lab Sample ID: 0305665-002E

Sample wt/vol: (g/mL) ML Lab File ID: C1_196.RAW

Level: (low/med) LOW Date Received: 5/23/03

% Moisture: not dec. Date Extracted:

GC Column: C-18 ID: 46 (mm) Date Analyzed: 6/4/03

Extract Volume: _____ (µl) Dilution Factor: 1.00

Injection Volume: 400 (µl)

CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L

CAS NO.	COMPOUND	µg/L	Q
1646-87-3	Aldicarb sulfoxide	1	U J
1646-88-4	Aldicarb sulfone	1	U
23135-22-0	Oxamyl	1	U
16752-77-5	Methomyl	1	U
16655-82-6	3-Hydroxycarbofuran	1	U
116-06-3	Aldicarb	1	U J
1563-66-2	Carbofuran	1	U
63-25-2	Carbaryl	1	U

07/17/03

FORM I VOA E531.1

Form 1

CLIENT SAMPLE NO.

224327-2
SPTW0430522G

Lab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN002 ~~ 07/17/03

Matrix: (soil/water) Potable Water Lab Sample ID: 0305665-002F

Sample wt/vol: (g/mL) ML Lab File ID: C1_142.RAW

Level: (low/med) LOW Date Received: 5/23/03

% Moisture: not dec. Date Extracted:

GC Column: K-CATION ID: 46 (mm) Date Analyzed: 5/30/03

Extract Volume: _____ (µl) Dilution Factor: 1.00

Injection Volume: 100 (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L	Q
1071-83-6	Glyphosate	10	U

FORM I VOA

E547

STLN002 S51

1E

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

224327-2
SPTW0430522G

~~ 07/17

Lab Name: H2M LABS, INC. Contract: ____

Lab Code: 10478 Case No.: STL-NEWBUR SAS No.: ____ SDG No.: STLN002

Matrix: (soil/water) WATER Lab Sample ID: 0305665-002A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A00483.RAW

% Moisture: Decanted: (Y/N) N Date Received: 05/23/03

Extraction: (Type) Date Extracted: 05/27/03

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/29/03

Injection Volume: 0.5 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: ____ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) UG/L	Q
75-99-0	Dalapon	1.0	U J
1918-00-9	Dicamba	0.080	U
94-75-7	2,4-D	0.25	U
87-86-5	Pentachlorophenol	0.20	U
93-72-1	2,4,5-TP (Silvex)	0.13	U
88-85-7	Dinoseb	0.20	U
1918-02-1	Picloram	1.3	U

~~ 07/17/03

FORM I PEST

OLM04.2

Form 1

CLIENT SAMPLE NO.

224327-2

SPTW04305 22G

Lab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN002 07/17/03

Matrix: (soil/water) Potable Water Lab Sample ID: 0305665-002G

Sample wt/vol: 250 (g/mL) ML Lab File ID: C2_109.RAW

Level: (low/med) LOW Date Received: 5/23/03

% Moisture: not dec. Date Extracted: 5/27/03

GC Column: PRP-1 ID: 46 (mm) Date Analyzed: 5/29/03

Extract Volume: 10000 (µl) Dilution Factor: 1.00

Injection Volume: 200 (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L	Q
85-00-7	Diquat	1	U

FORM I VOA

E549.1

STLN002 E15

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

SRTW0530121G

Lab Name: STL Newburgh Contract: 01003.10

Lab Code: 10142 Case No.: SAS No.: SDG No.: 220264

Matrix: (soil/water) WATER Lab Sample ID: 220264-001

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V5308.D

Level: (low/med) LOW Date Received: 1/22/2003

% Moisture: not dec. Date Analyzed: 1/23/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	0.5	U
74-87-3	Chloromethane	0.5	U
74-83-9	Bromomethane	0.5	U
75-01-4	Vinyl Chloride	0.5	U
75-00-3	Chloroethane	0.5	U
75-69-4	Trichlorofluoromethane	0.5	U
76-13-1	Freon 113	0.5	U
67-64-1	Acetone	0.5	U
75-15-0	Carbon Disulfide	0.5	U
75-09-2	Methylene Chloride	0.5	U
75-35-4	1,1-Dichloroethene	0.5	U
75-34-4	1,1-Dichloroethane	0.5	U
156-60-5	trans-1,2-Dichloroethylene	0.5	U
540-59-0	cis-1,2-Dichloroethene	0.5	U
67-66-3	Chloroform	0.5	U
107-06-2	1,2-Dichloroethane	0.5	U
78-93-3	2-Butanone	0.5	U
71-55-6	1,1,1-Trichloroethane	0.5	U
56-23-5	Carbon Tetrachloride	0.5	U
75-27-4	Bromodichloromethane	0.5	U
78-87-5	1,2-Dichloropropane	0.5	U
10061-01-5	cis-1,3-Dichloropropene	0.5	U
79-01-6	Trichloroethene	0.5	U
71-43-2	Benzene	0.5	U
124-48-1	Dibromochloromethane	0.5	U
10061-02-6	trans-1,3-Dichloropropene	0.5	U
79-00-5	1,1,2-Trichloroethane	0.5	U
75-25-2	Bromoform	0.5	U
108-10-1	4-Methyl-2-Pentanone	0.5	U
591-78-6	2-Hexanone	0.5	U
127-18-4	Tetrachloroethene	0.5	U
108-88-3	Toluene	0.5	U
108-90-7	Chlorobenzene	0.5	U
100-41-4	Ethylbenzene	0.5	U
100-42-5	Styrene	0.5	U
1634-04-4	MTBE	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U
1330-20-7	Xylenes, total	0.5	U

000019

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 562-0890
Fax (845) 562-0841

LABORATORY TEST RESULTS

Job Number: 218853 Date: 07/31/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SRTW0621204G
Date Sampled.....: 12/04/2002
Time Sampled.....: 17:30
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 218853-2
Date Received.....: 12/05/2002
Time Received.....: 12:20

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
SW846 8260B	Volatile Organics							
	Dichlorodifluoromethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Chloromethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Vinyl chloride	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Bromomethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Chloroethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Trichlorofluoromethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	1,1-Dichloroethene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Carbon disulfide	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Acetone	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Methylene chloride	0.50	U	U	0.50	ug/L	12/10/02	pcp
	trans-1,2-Dichloroethene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Methyl-tert-butyl-ether (MTBE)	1.0	U	U	1.0	ug/L	12/10/02	pcp
	1,1-Dichloroethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	cis-1,2-Dichloroethene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	2-Butanone (MEK)	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Chloroform	0.50	U	U	0.50	ug/L	12/10/02	pcp
	1,1,1-Trichloroethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Carbon tetrachloride	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Benzene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	1,2-Dichloroethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Trichloroethene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	1,2-Dichloropropane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Bromodichloromethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	cis-1,3-Dichloropropene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	4-Methyl-2-pentanone (MIBK)	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Toluene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	trans-1,3-Dichloropropene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	1,1,2-Trichloroethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Tetrachloroethene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	2-Hexanone	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Dibromochloromethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Chlorobenzene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Ethylbenzene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Styrene	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Bromoform	0.50	U	U	0.50	ug/L	12/10/02	pcp
	1,1,2,2-Tetrachloroethane	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Xylenes (total)	0.50	U	U	0.50	ug/L	12/10/02	pcp
	Freon 113	0.50	U	U	0.50	ug/L	12/10/02	pcp

* In Description = Dry Wgt.

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

SRTW0630312G

Lab Name: STL Newburgh Contract: 0100310

Lab Code: 10142 Case No.: SAS No.: SDG No.: 221992

Matrix: (soil/water) WATER Lab Sample ID: 221992-001

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: D0293.D

Level: (low/med) LOW Date Received: 3/12/2003

% Moisture: not dec. Date Analyzed: 3/13/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
1634-04-4	MTBE	1.0	U
71-43-2	Benzene	0.5	U
108-88-3	Toluene	0.5	U
108-90-7	Chlorobenzene	0.5	U
100-41-4	Ethylbenzene	0.5	U
108-38-3/106-42-	m,p-Xylene	0.5	U
95-47-6	o-Xylene	0.5	U
100-42-5	Styrene	0.5UJ ~~0.5~~	~~U~~
98-82-8	Isopropylbenzene	0.5	U
103-65-1	n-Propylbenzene	0.5	U
108-67-8	1,3,5-Trimethylbenzene	0.5	U
98-06-6	tert-Butylbenzene	0.5	U
95-63-6	1,2,4-Trimethylbenzene	0.5	U
135-98-8	sec-Butylbenzene	0.5	U
99-87-6	p-Isopropyltoluene	0.5	U
541-73-1	1,3-Dichlorobenzene	0.5	U
106-46-7	1,4-Dichlorobenzene	0.5	U
104-51-8	n-Butylbenzene	0.5UJ ~~0.5~~	~~U~~
95-50-1	1,2-Dichlorobenzene	0.5	U
120-82-1	1,2,4-Trichlorobenzene	0.5	U
91-20-3	Naphthalene	0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	U
75-71-8	Dichlorodifluoromethane	0.5	U
74-87-3	Chloromethane	0.5UJ ~~0.5~~	~~U~~
75-01-4	Vinyl Chloride	0.5	U
74-83-9	Bromomethane	0.5UJ ~~0.5~~	~~U~~
75-00-3	Chloroethane	0.5	U
75-69-4	Trichlorofluoromethane	0.5	U
75-35-4	1,1-Dichloroethene	0.5	U
75-09-2	Methylene Chloride	0.5	U
156-60-5	trans-1,2-Dichloroethene	0.5	U
75-34-4	1,1-Dichloroethane	0.5	U
540-59-0	cis-1,2-Dichloroethene	0.5	U
590-20-7	2,2-Dichloropropane	0.5	U
67-66-3	Chloroform	0.5	U
74-97-5	Bromochloromethane	0.5	U
71-55-6	1,1,1-Trichloroethane	0.5	U
563-58-6	1,1-Dichloropropene	0.5	U
56-23-5	Carbon Tetrachloride	0.5	U

L. Dickinson 7/10/03

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SRTW0630312G

Lab Name: STL Newburgh Contract: 0100310

Lab Code: 10142 Case No.: ____ SAS No.: ____ SDG No.: 221992

Matrix (soil/water) WATER Lab Sample ID: 221992-001

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: D0293.D

Level: (low/med) LOW Date Received: 3/12/2003

% Moisture: not dec. ____ Date Analyzed: 3/13/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: ____ (uL) Soil Aliquot Volume: ____ (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
106-93-4	1,2-Dichloroethane	0.5	U
79-01-6	Trichloroethene	0.5	U
78-87-5	1,2-Dichloropropane	0.5	U
75-27-4	Bromodichloromethane	0.5	U
74-95-3	Dibromomethane	0.5	U
10061-01-5	cis-1,3-Dichloropropene	0.5	U
10061-02-6	trans-1,3-Dichloropropene	0.5	U
79-00-5	1,1,2-Trichloroethane	0.5	U
142-28-9	1,3-Dichloropropane	0.5	U
127-18-4	Tetrachloroethene	0.5	U
124-48-1	Dibromochloromethane	0.5	U
106-93-4	1,2-Dibromoethane	0.5	U
79-34-5	1,1,1,2-Tetrachloroethane	0.5	U
75-25-2	Bromoform	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	U
108-86-1	Bromobenzene	0.5	U
95-49-8	2-Chlorotoluene	0.5	U
106-43-4	4-Chlorotoluene	0.5	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	U
87-68-3	Hexachlorobutadiene	0.5	U

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LABORATORY TEST RESULTS

Job Number: 221992 Date: 03/26/2003

CUSTOMER: Groundwater Sciences PROJECT: D1003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SRTW0630312G
Date Sampled.....: 03/12/2003
Time Sampled.....: 12:55
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 221992-1
Date Received.....: 03/12/2003
Time Received.....: 14:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
EPA 504	GC Micro-Extractable Volatiles							
	1,2-Dibromoethane (EDB)	0.020	U		0.020	ug/L	03/24/03	smo
	1,2-Dibromo-3-chloropropane	0.020	U		0.020	ug/L	03/24/03	smo

* In Description = Dry Wgt.

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ST1303120312

Lab Name: STL Newburgh Contract: 0100310

Lab Code: 10142 Case No.: ____ SAS No.: ____ SDG No.: 221992

Matrix: (soil/water) WATER Lab Sample ID: 221992-002

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: D0295.D

Level: (low/med) LOW Date Received: 3/12/2003

% Moisture: not dec. ____ Date Analyzed: 3/13/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: ____ (uL) Soil Aliquot Volume: ____ (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
1634-04-4	MTBE	1.0	U
71-43-2	Benzene	0.5	U
108-88-3	Toluene	0.5	U
108-90-7	Chlorobenzene	0.5	U
100-41-4	Ethylbenzene	0.5	U
108-38-3/106-42-	m,p-Xylene	0.5	U
95-47-6	o-Xylene	0.5	U
100-42-5	Styrene	0.5UJ ~~0.5~~	~~U~~
98-82-8	Isopropylbenzene	0.5	U
103-65-1	n-Propylbenzene	0.5	U
108-67-8	1,3,5-Trimethylbenzene	0.5	U
98-06-6	tert-Butylbenzene	0.5	U
95-63-6	1,2,4-Trimethylbenzene	0.5	U
135-98-8	sec-Butylbenzene	0.5	U
99-87-6	p-Isopropyltoluene	0.5	U
541-73-1	1,3-Dichlorobenzene	0.5	U
106-46-7	1,4-Dichlorobenzene	0.5	U
104-51-8	n-Butylbenzene	0.5UJ ~~0.5~~	~~U~~
95-50-1	1,2-Dichlorobenzene	0.5	U
120-82-1	1,2,4-Trichlorobenzene	0.5	U
91-20-3	Naphthalene	0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	U
75-71-8	Dichlorodifluoromethane	0.5	U
74-87-3	Chloromethane	0.5UJ ~~0.5~~	~~U~~
75-01-4	Vinyl Chloride	0.5	U
74-83-9	Bromomethane	0.5UJ ~~0.5~~	~~U~~
75-00-3	Chloroethane	0.5	U
75-69-4	Trichlorofluoromethane	0.5	U
75-35-4	1,1-Dichloroethene	0.5	U
75-09-2	Methylene Chloride	0.5	U
156-60-5	trans-1,2-Dichloroethene	0.5	U
75-34-4	1,1-Dichloroethane	0.5	U
540-59-0	cis-1,2-Dichloroethene	0.5	U
590-20-7	2,2-Dichloropropane	0.5	U
67-66-3	Chloroform	0.5	U
74-97-5	Bromochloromethane	0.5	U
71-55-6	1,1,1-Trichloroethane	0.5	U
563-58-6	1,1-Dichloropropene	0.5	U
56-23-5	Carbon Tetrachloride	0.5	U

L. Dickinson 7/10/03

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ST1303120312

Lab Name: STL Newburgh Contract: 0100310

Lab Code: 10142 Case No.: ____ SAS No.: ____ SDG No.: 221992

Matrix: (soil/water) WATER Lab Sample ID: 221992-002

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: D0295.D

Level: (low/med) LOW Date Received: 3/12/2003

% Moisture: not dec. ____ Date Analyzed: 3/13/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: ____ (uL) Soil Aliquot Volume: ____ (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
106-93-4	1,2-Dichloroethane	0.5	U
79-01-6	Trichloroethene	0.5	U
78-87-5	1,2-Dichloropropane	0.5	U
75-27-4	Bromodichloromethane	0.5	U
74-95-3	Dibromomethane	0.5	U
10061-01-5	cis-1,3-Dichloropropene	0.5	U
10061-02-6	trans-1,3-Dichloropropene	0.5	U
79-00-5	1,1,2-Trichloroethane	0.5	U
142-28-9	1,3-Dichloropropane	0.5	U
127-18-4	Tetrachloroethene	0.5	U
124-48-1	Dibromochloromethane	0.5	U
106-93-4	1,2-Dibromoethane	0.5	U
79-34-5	1,1,1,2-Tetrachloroethane	0.5	U
75-25-2	Bromoform	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	U
108-86-1	Bromobenzene	0.5	U
95-49-8	2-Chlorotoluene	0.5	U
106-43-4	4-Chlorotoluene	0.5	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	U
87-68-3	Hexachlorobutadiene	0.5	U

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000135

LABORATORY TEST RESULTS

Job Number: 221992 Date:03/27/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SRTW06303312G
Date Sampled.....: 03/12/2003
Time Sampled.....: 12:55
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 221992-1
Date Received.....: 03/12/2003
Time Received.....: 14:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	DI	DATE	TECH
SM18 3113B	Antimony (Sb)	0.97	U	UJ COE 7/16/03	0.97	3.0	1	ug/L		03/18/03	mch
SM18 3113B	Selenium (Se)	0.70	U		0.70	5.0	1	ug/L		03/18/03	mch
EPA 245.1	Mercury (Hg)	0.20	U		0.20	0.20	1	ug/L		03/16/03	las
EPA 200.9	Metals Analysis (GFAA)										
	Thallium (Tl)	0.50	U		0.50	1.5	1	ug/L		03/19/03	mch
EPA 200.7	Metals Analysis (ICP)										
	Arsenic (As)	1.6	U		1.6	5.0	1	ug/L		03/18/03	mad
	Barium (Ba)	21.3	B		0.25	150	1	ug/L		03/18/03	mad
	Beryllium (Be)	0.20	U		0.20	1.0	1	ug/L		03/18/03	mad
	Cadmium (Cd)	0.15	U		0.15	2.0	1	ug/L		03/18/03	mad
	Chromium (Cr)	0.60	U		0.60	10.0	1	ug/L		03/18/03	mad
	Iron (Fe)	743			2.5	60.0	1	ug/L		03/18/03	mad
	Manganese (Mn)	62.9			0.65	10.0	1	ug/L		03/18/03	mad
	Nickel (Ni)	1.5	B		1.2	10.0	1	ug/L		03/18/03	mad
	Silver (Ag)	1.2	U		1.2	10.0	1	ug/L		03/18/03	mad
	Sodium (Na)	4340			106	200	1	ug/L		03/18/03	mad
	Zinc (Zn)	0.95	U		0.95	20.0	1	ug/L		03/18/03	mad

* In Description = Dry Wgt.

LABORATORY TEST RESULTS

Job Number: 221992 Date: 03/28/2003

CUSTOMER: Groundwater Sciences PROJECT: 01003.10.0203 SHEN ATTN: Dorothy Bergmann

Customer Sample ID: SRTW06303312G
Date Sampled.....: 03/12/2003
Time Sampled.....: 12:55
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 221992-1
Date Received.....: 03/12/2003
Time Received.....: 14:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TEC
SM18 9223	E. Coliform Count	1.00	U		1.00	MPN/100ml	03/12/03	mam
SM18 9223	Total Coliform Count	1.00	U		1.00	MPN/100ml	03/12/03	mam
SM18 2120B	Color	15			2.5	Pt/Co	03/12/03	mam
SM18 2150B	Odor	1			1	T.O.N.	03/12/03	mam
SM18 4500Cl	Chloride	5.0	U		5.0	mg/L	03/17/03	mam
SM18 4500CNE	Cyanide, Total	0.0100	U		0.0100	mg/L	03/20/03	nmd
SM18 4500NO2B	Nitrite as N (NO2-N)	0.02	UJ	H COE 7/16/03	0.01	mg/L	03/13/03	nmd
EPA 300.0	Ion Chromatography Analysis							
	Fluoride	0.500	U		0.500	mg/L	03/13/03	bg
	Nitrate as N (NO3-N)	0.500	U		0.500	mg/L	03/13/03	bg
	Sulfate	9.76			5.00	mg/L	03/14/03	rmc

* In Description = Dry Wgt.

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SEVERN TRENT STL

NYSDOH 10142 NJDEP 73015 CTDOHS PH-0554 EPA NY049 PA 68-376 M-NY049

000136

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Environmental Health Laboratories
Sample Result Record Sheet

Sample Matrix: DW
Acquisition File: Not Available
Data Directory: 031403a
Instrument: GC/MS - T
Extracted Date: 03/14/2003
Sample Number: 861029
Dilution Factor: 10
Sample Site: 221992-1 SRTW0630312G
Sample Location: SR Newburgh SRTW0630312G
EED 7/15/03

Method: 548.1
Calibration File: m-548 1-t-031003.mth
Analysis Date: 03/14/2003
Analysis Time: 22:13
Analyst: werbians
Results Submitted By: werbians
Run Number: 52395

Sample Quality Control

Internal Standards Parameter	Area	CCC Area	CCC % Resp	CCC Area Limits Lwr	CCC Area Limits Upr	CCC Pass / Fail	IC Avg Area	IC % Resp	IC Area Limits Lwr	IC Area Limits Upr	IC Pass / Fail
IS-4,4'-Dibromooctafluorobiphenyl	63055	63963	99	70	130	PASS	Not Found	N/A	N/A	N/A	N/A

Surrogate Standards Parameter	Amount	Units	Target	%Rec	Limits Lower	Limits Upper	Pass/Fail
SS-2,4-Dichlorophenylacetic acid	443.573	ug/L	50	89	70	130	PASS

Ordered Parameter Results

Parameter	Amount	MRL	Units
Endothall	< 9.0	9.0	ug/L

Additional Found Parameters

Parameter	Amount	MRL	Units

The symbol * in the Amount column above indicates that the sample was re-analyzed for that parameter and the results are presented on another page.

SEVERN TRENT STL

Doug Tawse
STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550

March 28, 2003

Dear Doug:

Please find enclosed results for three (3) samples, Billing Ref: Shenandoah, STL Job #205996, which you submitted for asbestos analysis by Transmission Electron Microscopy (TEM).

The results are listed according to the NYELAP Certification Manual and USEPA Phase II Primary and Secondary Drinking Water Regulations EPA Method 100.2 ("<" is equal to the value of the detection limit).

CLIENT SAMPLE ID	A (million fibers/liter)	DATE FILTERED	DATE ANALYZED
221570-1	<0.178	03/04/03; 11:25	03/28/03; 10:40
221715-1	<0.178	03/06/03; 11:41	03/28/03; 11:00
221992-1 SRTW0630312G	<0.195	03/13/03; 11:18	03/28/03; 11:59

The final maximum contaminant level goal (MCLG) and maximum contaminant level (MCL) for asbestos in water is 7.0 Million fibers/liter.

STL Billerica is accredited by NYELAP (#10838) and the Commonwealth of Massachusetts (#M-MA038) for asbestos analysis of water samples

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted above.

Severn Trent Laboratories is not responsible for incorrect sampling procedures since these water samples were not collected by our lab personnel. STL is only responsible for the analysis and reporting of submitted samples. Accreditation in no way constitutes or implies product certification, approval, or endorsement by NELAC. This report relates only to the specific samples tested herein. The enclosed report shall not be reproduced except in full, without the written approval of STL.

Should you have further questions, or need additional information, please feel free to contact Client Services or me at any time.

Sincerely,

Ernest T. Dobi

Ernest T. Dobi, Ph.D.
Manager-Microscopy Service

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Golden, CO 80403 USA
Tel: (303) 279-4501
Fax: (303) 278-1528

DATE	March 31, 2003
HRI PROJECT	002-CH9
HRI SERIES NO.	C239/03
DATE REC'D	03/13/2003
CUST. P.O.#	03-07

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REPORT OF ANALYSIS

SAMPLE NO. C239/03-1

SAMPLE IDENTIFICATION: 221992-1 - SRTW0630312G - Shenandoah - sampled on 03/12/2003 @ 1255

PARAMETER	RESULT	DETECTION LIMIT	METHOD	ANALYSIS DATE	ANALYST
Radon (+-Precision*), pCi/l (T)	210(+-20)	12	SM 7500-Rn B	03/13/2003 @ 1832	LH

*Variability of the radioactive decay process (counting error) at the 95% confidence level, 1.96 sigma.
Certification ID's: CO/EPA - CO00008; CT - PH-0152; KY - 90076; KS - E-10265; NH - 232601-A; NY ELAP - 11417; PA DEP 68551; WI - 998376610

CODES:
(T) = Total (D) = Dissolved
(S) = Suspended (R) = Total Recoverable
(PD) = Potentially Dissolved
< = Less Than

By: Robert Rostad
Laboratory Manager

An Employee-Owned Company

STL ST. LOUIS

STL NEWBURGH

Client Sample ID: SRTW0630312G

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F3C140360-003
Work Order: FJ7W0
Matrix: WATER

Date Collected: 03/12/03 1255
Date Received: 03/14/03 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
GROSS A/B BY GFPC EPA 900.0 MOD				pCi/L	900.0 MOD			
Gross Alpha	3.6		2.2	2.8	03/18/03	03/22/03	3078224	
Gross Beta	~~1.7~~ 3.1	U	1.8	3.1	03/18/03	03/22/03	3078224	
RA-226 BY EPA-903.0 MOD				pCi/L	903.0 MOD			
Radium (226)	~~0.003~~ 0.22	U	0.11	0.22	03/25/03	04/11/03	3084253	63
RA-228 BY GFPC EPA 904 MOD				pCi/L	904 MOD			
Radium 228	~~0.71~~ 0.92	U	0.58	0.92	03/25/03	04/11/03	3084254	61

DAS 7/20/03

NOTE(S)
Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Bold results are greater than the MDC
U Result is less than the sample detection limit.

STL NEWBURGH

Client Sample ID: SRTW0630312G

Trace Level Organic Compounds

Lot-Sample #...: G3C140254-003 Work Order #...: FJ6531AA Matrix.....: WATER
Date Sampled...: 03/12/03 Date Received..: 03/14/03
Prep Date.....: 03/17/03 Analysis Date..: 03/20/03
Prep Batch #...: 3076561
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	5.0	pg/L	EPA-S 1613B-Tetra

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	100	(25 - 141)

Form 1

CLIENT SAMPLE NO

221992-1

SRTW0630312 m09

Lab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN001

Matrix: (soil/water) Potable Water Lab Sample ID: 0303341-001A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: B00202.RAW

Level: (low/med) LOW Date Received: 3/13/03

% Moisture: not dec. Date Extracted: 3/14/03

GC Column: R-35 ID: .53 (mm) Date Analyzed: 3/18/03

Extract Volume: 5000 (µl) Dilution Factor: 1.00

Injection Volume: 0.5 (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L	Q
75-99-0	Dalapon	1	U
1918-00-9	Dicamba	0.08	U
94-75-7	2,4-D	0.3	U
87-86-5	Pentachlorophenol	0.2	U
93-72-1	2,4,5-TP (Silvex)	0.1	U
88-85-7	Dinoseb	0.2	U
1918-02-1	Picloram	1	U

FORM I VOA E515.1

Form 1

CLIENT SAMPLE NO.

221992-1

SRTW06303 12 G

07/04/03

Lab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN001

Matrix: (soil/water) Potable Water Lab Sample ID: 0303341-001H

Sample wt/vol: 250 (g/mL) ML Lab File ID: C2-083.RAW

Level: (low/med) LOW Date Received: 3/13/03

% Moisture: not dec. Date Extracted: 3/17/03

GC Column: PRP-1 ID: 4.1 (mm) Date Analyzed: 3/26/03

Extract Volume: 10000 (µl) Dilution Factor: 1.00

Injection Volume: 100 (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L	Q
85-00-7	Diquat	1	U

FORM I VOA E549.1

STLN001 S57

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

221992-1

SRTW06303 12 G

07/04/03

Lab Name: H2M LABS, INC. Contract: ____

Lab Code: 10478 Case No.: STL-NEWBU SAS No.: _____ SDG No.: STLN001

Matrix: (soil/water) WATER Lab Sample ID: 0303341-001B

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 3A\N2658.D

Level: (low/med) LOW Date Received: 03/13/03

% Moisture: Decanted: (Y/N) N Date Extracted: 03/19/03

Concentrated Extract Volume: 1000 (µL) Date Analyzed: 03/24/03

Injection Volume: 1 (µL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) SPE

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) UG/L	Q
77-47-4	Hexachlorocyclopentadiene	0.6	U
1918-16-7	Propachlor	1	U
118-74-1	Hexachlorobenzene	0.3	U
122-34-9	Simazine	0.5	U
1912-24-9	Atrazine	0.5	U
21087-64-9	Metribuzin	0.5	U
15972-60-8	Alachlor	1	U
51218-45-2	Metolachlor	1	U
23184-66-9	Butachlor	1	U
103-23-1	bis(2-Ethylhexyl)adipate	1	U
117-81-7	Bis(2-ethylhexyl)phthalate	3	U
50-32-8	Benzo(a)pyrene	0.1	U

FORM I SV- 1 OLM04.2

STLN001 S51

Form 1

CLIENT SAMPLE NO.

221992-1

SRTW06303126

Lab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN001

Matrix: (soil/water) Potable Water Lab Sample ID: 0303341-001C

Sample wt/vol: 35 (g/mL) ML Lab File ID: A00248.RAW

Level: (low/med) LOW Date Received: 3/13/03

% Moisture: not dec. Date Extracted: 3/19/03

GC Column: R-CLP ID: .53 (mm) Date Analyzed: 3/19/03

Extract Volume: 2000 (µl) Dilution Factor: 1.00

Injection Volume: 1 (µl)

CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L

CAS NO.	COMPOUND	µg/L	Q
106-93-4	1,2-Dibromoethane	0.02	U
96-12-8	1,2-Dibromo-3-chloropropane	0.02	U

FORM I VOA E504.1

Form 1

CLIENT SAMPLE NO.

221992-1

SRTW06303126

Lab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN001

Matrix: (soil/water) Potable Water Lab Sample ID: 0303341-001E

Sample wt/vol: 35 (g/mL) ML Lab File ID: A00182.RAW

Level: (low/med) LOW Date Received: 3/13/03

% Moisture: not dec. Date Extracted: 3/13/03

GC Column: R-CLP ID: .53 (mm) Date Analyzed: 3/14/03

Extract Volume: 2000 (µl) Dilution Factor: 1.00

Injection Volume: 1 (µl)

CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L

CAS NO.	COMPOUND	µg/L	Q
309-00-2	Aldrin	0.03	U
58-89-9	Lindane	0.03	U
76-44-8	Heptachlor	0.03	U
57-74-9	Chlordane	0.5	U
1024-57-3	Heptachlor epoxide	0.03	U
	Total PCBs	0.5	U
60-57-1	Dieldrin	0.05	U
72-20-8	Endrin	0.05	U
72-43-5	Methoxychlor	0.3	U
8001-35-2	Toxaphene	3	U

FORM I VOA E505

STLN001 S52

Form 1

CLIENT SAMPLE NO.

221992-1

SRTW06303126

Lab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN001

Matrix: (soil/water) Potable Water Lab Sample ID: 0303341-001G

Sample wt/vol: (g/mL) ML Lab File ID: C1-039.RAW

Level: (low/med) LOW Date Received: 3/13/03

% Moisture: not dec. Date Extracted:

GC Column: C-18 ID: 46 (mm) Date Analyzed: 3/15/03

Extract Volume: _____ (µl) Dilution Factor: 1.00

Injection Volume: 400 (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L	Q
1646-87-3	Aldicarb sulfoxide	1	U
1646-88-4	Aldicarb sulfone	1	U
23135-22-0	Oxamyl	1	U
16752-77-5	Methomyl	1	U
16655-82-6	3-Hydroxycarbofuran	1	U
116-06-3	Aldicarb	1	U
1563-66-2	Carbofuran	1	U
63-25-2	Carbaryl	1	U

FORM I VOA

E531.1

STLN001 S54

Form 1

CLIENT SAMPLE NO.

221992-1

SRTW06303126

Lab Name: H2M LABS, INC. Contract: _____

Lab Code: 10478 Case No.: STL-NEWB SAS No.: _____ SDG No.: STLN001

Matrix: (soil/water) Potable Water Lab Sample ID: 0303341-001F

Sample wt/vol: (g/mL) ML Lab File ID: C1-068.RAW

Level: (low/med) LOW Date Received: 3/13/03

% Moisture: not dec. Date Extracted:

GC Column: ID: (mm) Date Analyzed: 3/17/03

Extract Volume: _____ (µl) Dilution Factor: 1.00

Injection Volume: 100 (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) µg/L	Q
1071-83-6	Glyphosate	10	U

FORM I VOA

E547

TW-3 64-Hr Test Field Water Quality Data

Route 376 Properties
TW-3 64-Hour Constant-rate Pumping Test
TW-3 Field Water Quality Data

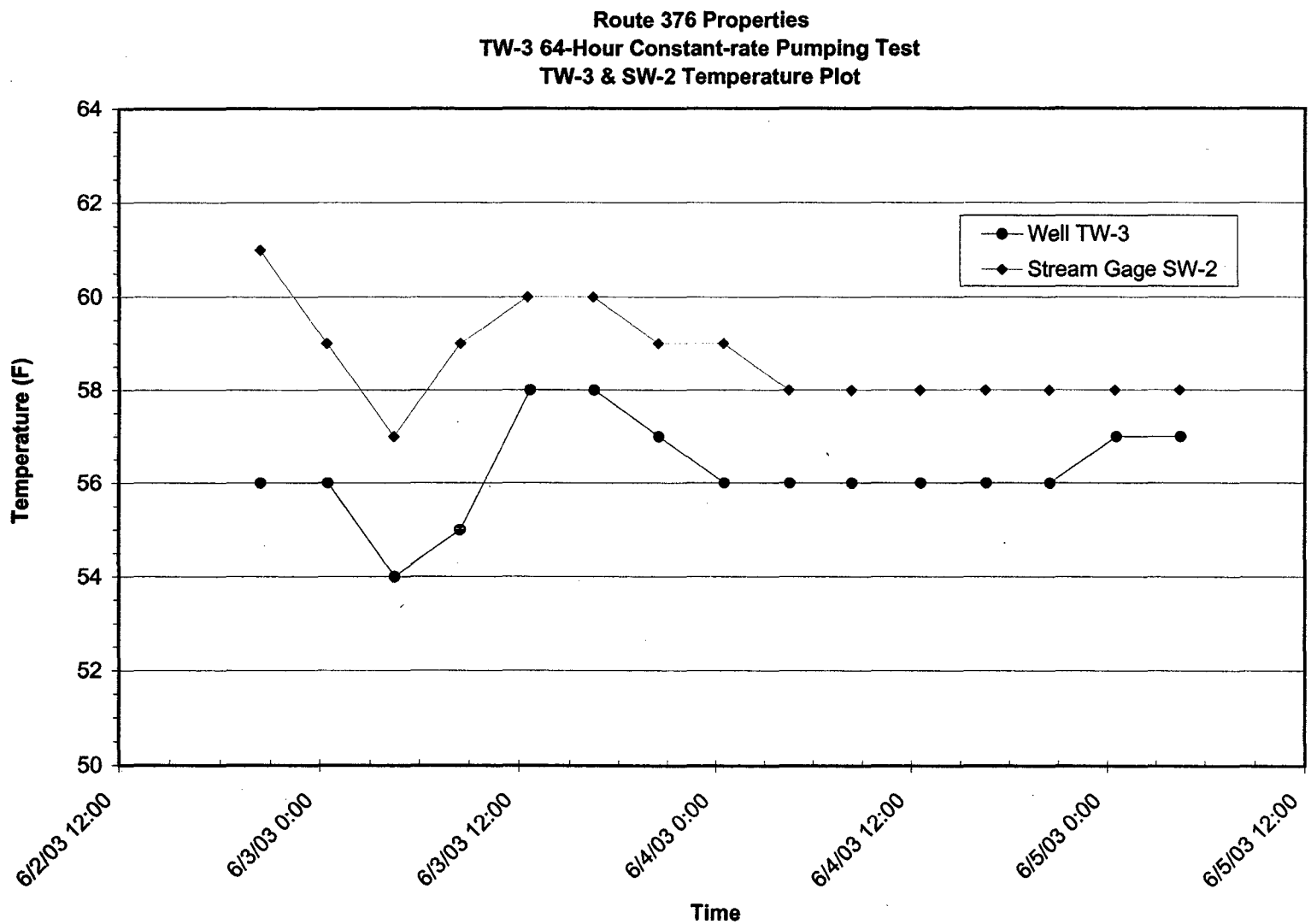
Date	Time	Temp (F)	pH	Conductivity (uS)	Turbidity (NTUs)	Tester
6/2/2003	20:25	56	7.69	630	0.71	KLT
6/3/2003	0:29	56	7.83	650	0.34	KLT
6/3/2003	4:30	54	7.75	640	0.51	KLT
6/3/2003	8:28	55	7.82	630	0.96	KLT
6/3/2003	12:40	58	7.84	620	1.08	SMF
6/3/2003	16:30	58	7.84	640	0.95	SMF
6/3/2003	20:29	57	7.84	630	0.45	KLT
6/4/2003	0:32	56	7.84	640	0.31	KLT
6/4/2003	4:34	56	7.85	630	0.22	KLT
6/4/2003	8:22	56	7.76	620	0.02	KLT
6/4/2003	12:35	56	7.85	620	0.55	SMF
6/4/2003	16:35	56	7.87	640	4.33	SMF
6/4/2003	20:29	56	7.79	640	1.93	KLT
6/5/2003	0:33	57	7.79	630	2.61	KLT
6/5/2003	4:32	57	7.80	630	1.86	KLT

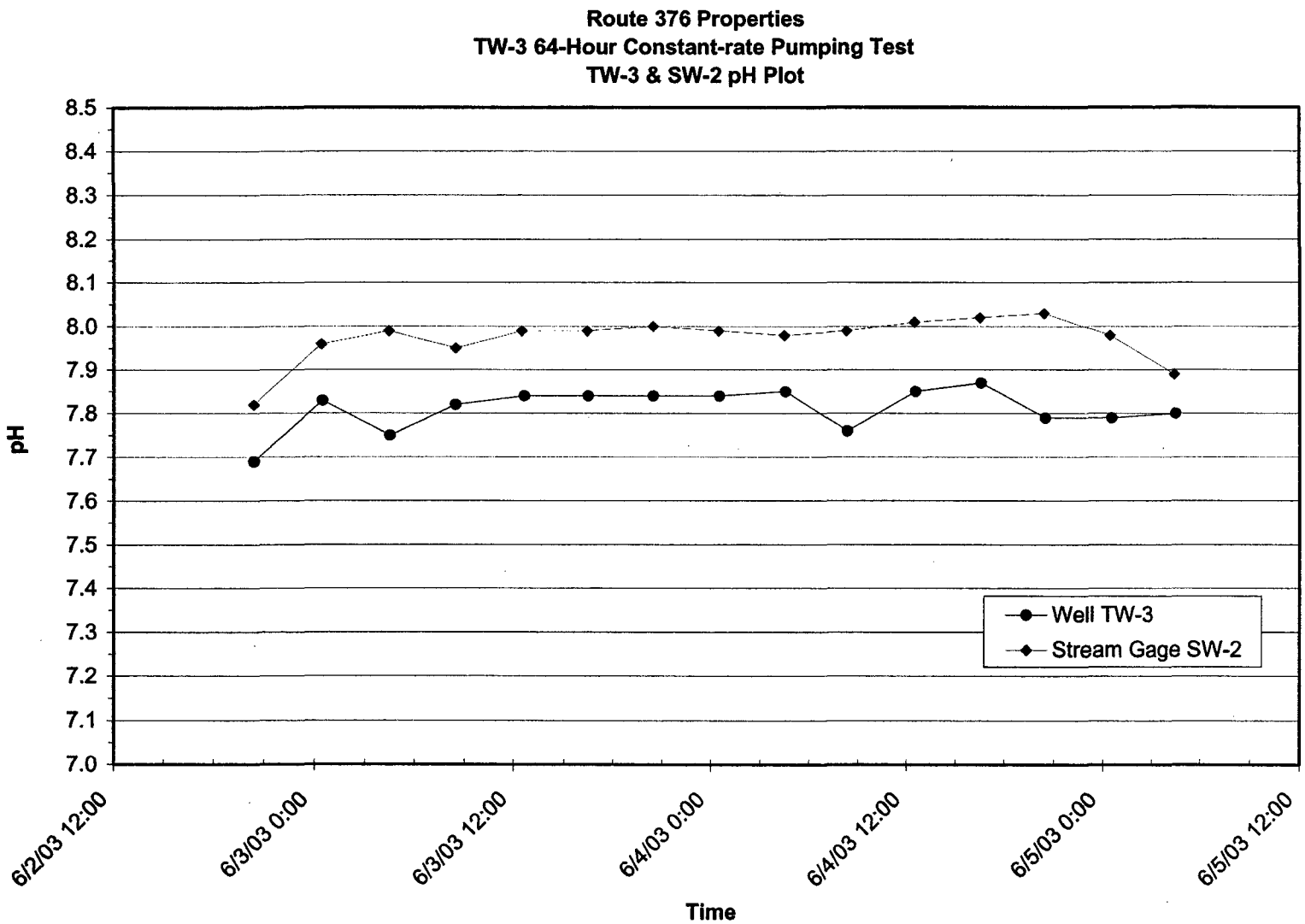
Notes:
F - degrees Fahrenheit
uS - microSiemens
NTUs - nephelometric turbidity units

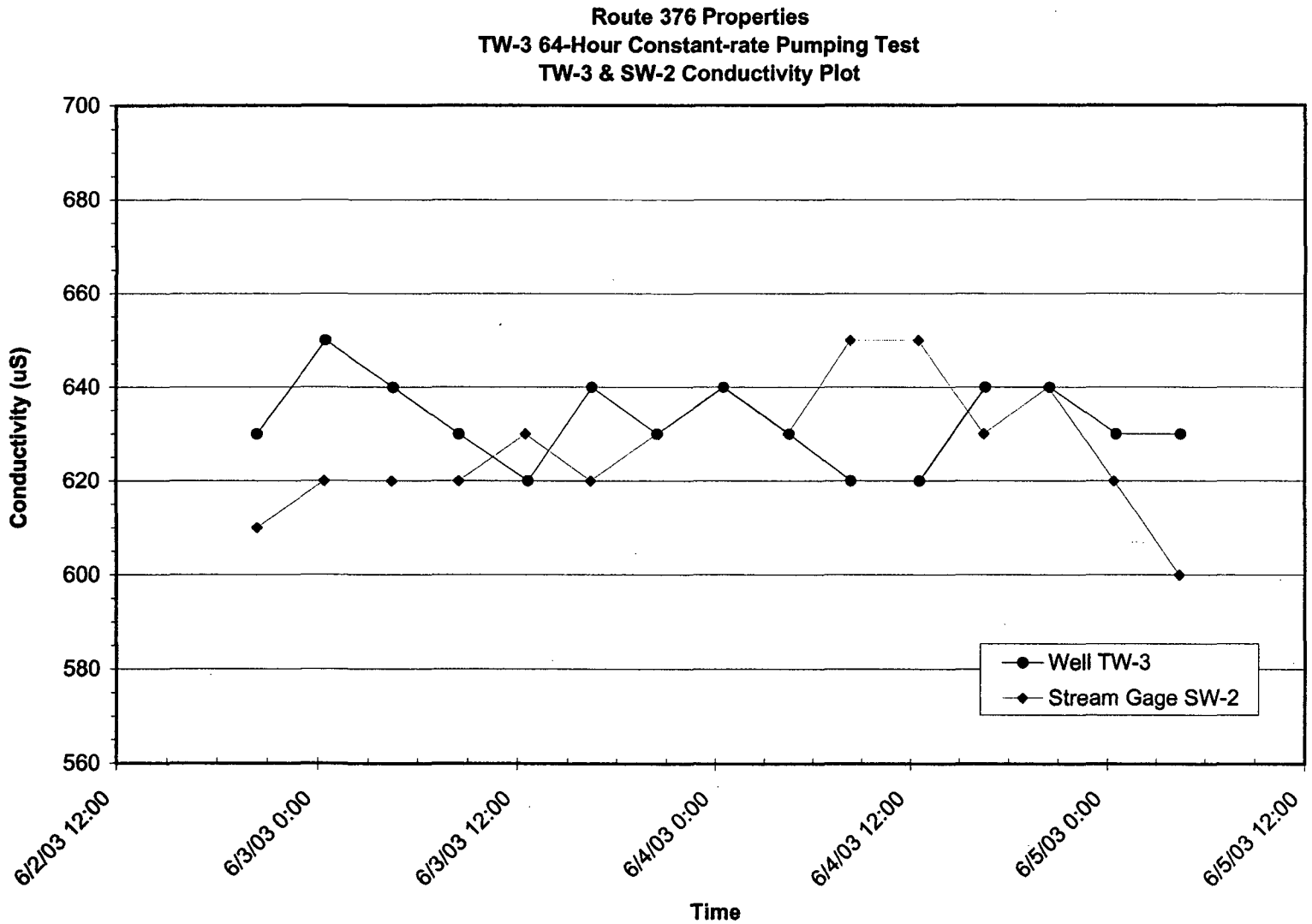
Route 376 Properties
TW-3 64-Hour Constant-rate Pumping Test
SW-2 Field Water Quality Data

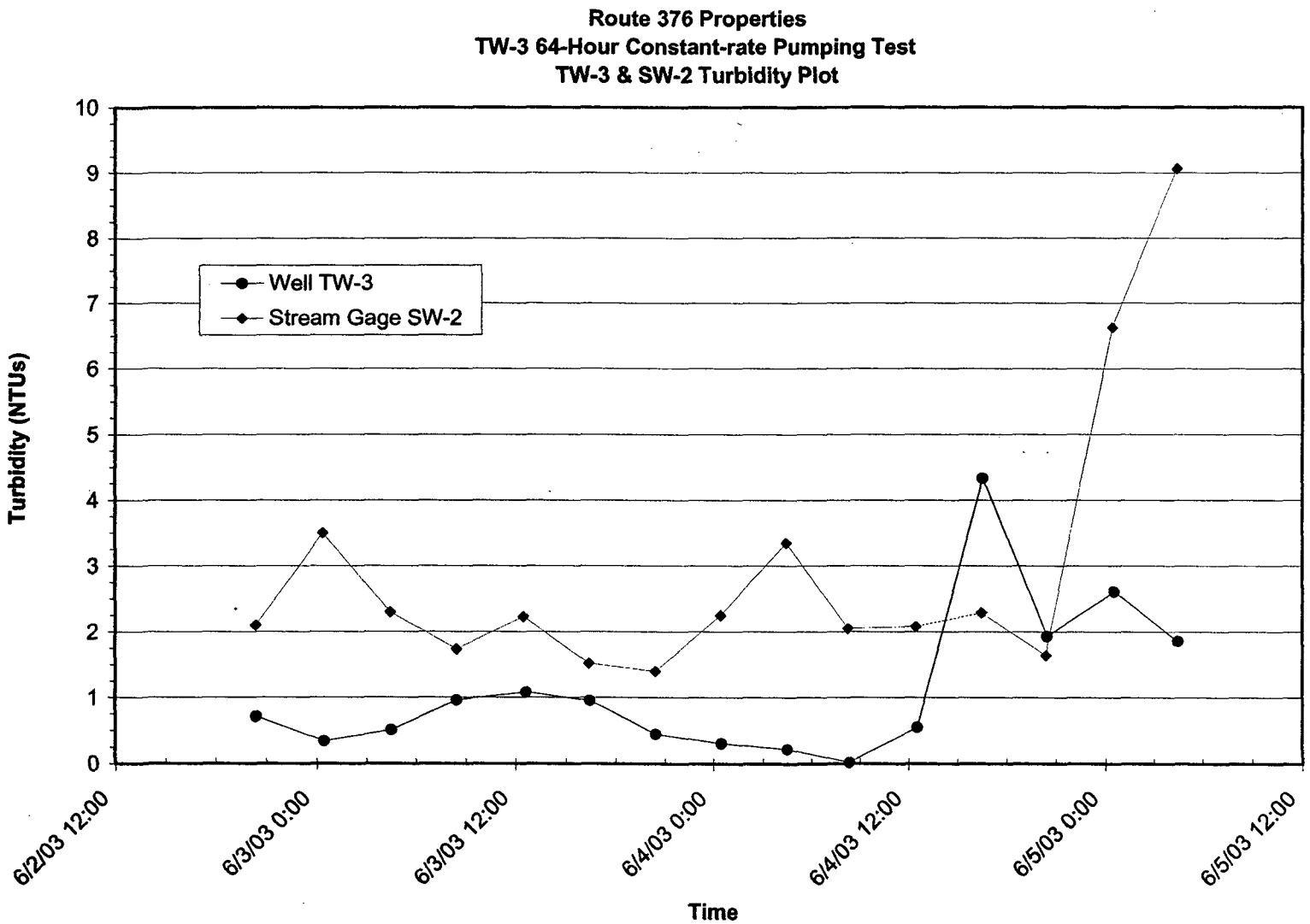
Date	Time	Temp (F)	pH	Conductivity (uS)	Turbidity (NTUs)	Tester
6/2/2003	20:24	61	7.82	610	2.10	KLT
6/3/2003	0:25	59	7.96	620	3.50	KLT
6/3/2003	4:27	57	7.99	620	2.30	KLT
6/3/2003	8:28	59	7.95	620	1.74	KLT
6/3/2003	12:30	60	7.99	630	2.23	SMF
6/3/2003	16:26	60	7.99	620	1.52	SMF
6/3/2003	20:27	59	8.00	630	1.40	KLT
6/4/2003	0:28	59	7.99	640	2.25	KLT
6/4/2003	4:29	58	7.98	630	3.35	KLT
6/4/2003	8:19	58	7.99	650	2.05	KLT
6/4/2003	12:30	58	8.01	650	2.08	SMF
6/4/2003	16:30	58	8.02	630	2.29	SMF
6/4/2003	20:24	58	8.03	640	1.64	KLT
6/5/2003	0:25	58	7.98	620	6.63	KLT
6/5/2003	4:27	58	7.89	600	9.06	KLT

Notes:
F - degrees Fahrenheit
uS - microSiemens
NTUs - nephelometric turbidity units


Route 376 Properties
TW-3 64-Hour Constant-rate Pumping Test
TW-3 & SW-2 Temperature Plot
Temperature (F)
64
62
60
58
56
54
52
50
Well TW-3
Stream Gage SW-2
6/2/03 12:00
6/3/03 0:00
6/3/03 12:00
6/4/03 0:00
6/4/03 12:00
6/5/03 0:00
6/5/03 12:00
Time


Route 376 Properties
TW-3 64-Hour Constant-rate Pumping Test
TW-3 & SW-2 pH Plot
pH
8.5
8.4
8.3
8.2
8.1
8.0
7.9
7.8
7.7
7.6
7.5
7.4
7.3
7.2
7.1
7.0
6/2/03 12:00
6/3/03 0:00
6/3/03 12:00
6/4/03 0:00
6/4/03 12:00
6/5/03 0:00
6/5/03 12:00
Time
Well TW-3
Stream Gage SW-2


Route 376 Properties
TW-3 64-Hour Constant-rate Pumping Test
TW-3 & SW-2 Conductivity Plot
Conductivity (uS)
700
680
660
640
620
600
580
560
6/2/03 12:00
6/3/03 0:00
6/3/03 12:00
6/4/03 0:00
6/4/03 12:00
6/5/03 0:00
6/5/03 12:00
Time
Well TW-3
Stream Gage SW-2


Route 376 Properties
TW-3 64-Hour Constant-rate Pumping Test
TW-3 & SW-2 Turbidity Plot
Turbidity (NTUs)
10
9
8
7
6
5
4
3
2
1
0
Well TW-3
Stream Gage SW-2
6/2/03 12:00
6/3/03 0:00
6/3/03 12:00
6/4/03 0:00
6/4/03 12:00
6/5/03 0:00
6/5/03 12:00
Time

TW-3 72-Hr Test Field Water Quality Data

Route 376 Properties
TW-3 72-Hour Constant-rate Pumping Test
TW-3 Field Water Quality Data

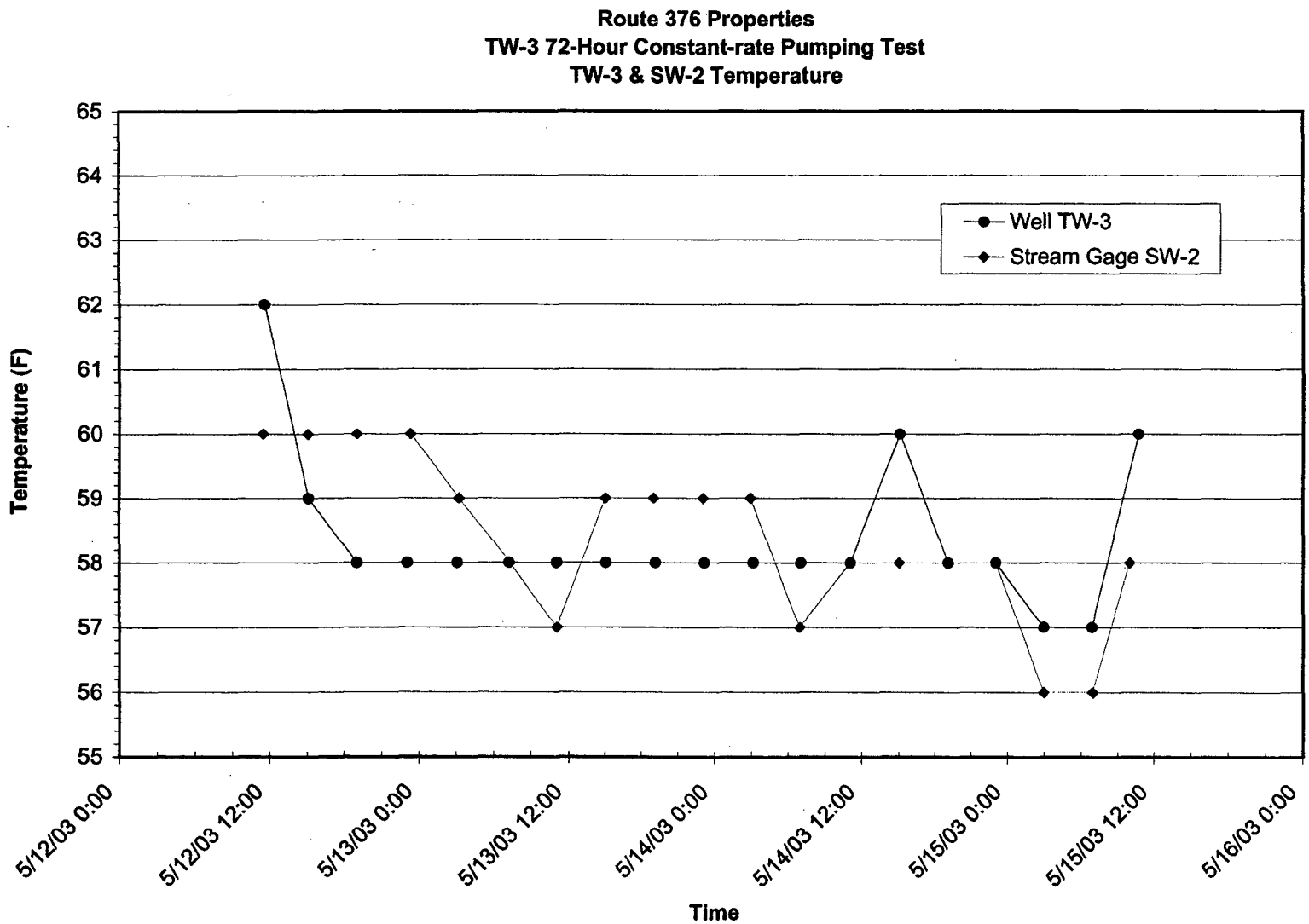
Date	Time	Temp (F)	pH	Conductivity (uS)	Turbidity NTUs	Tester
5/12/2003	11:40	62	7.63	620	2.23	JNK/SMF
5/12/2003	15:10	59	7.75	620	2.28	SMF
5/12/2003	19:05	58	7.80	640	2.98	SMF
5/12/2003	23:05	58	7.77	630	1.95	JNK
5/13/2003	3:07	58	7.80	620	1.30	JNK
5/13/2003	7:15	58	7.81	610	1.20	JNK
5/13/2003	11:05	58	7.80	620	1.25	JNK/SMF
5/13/2003	15:07	58	7.79	620	1.60	SMF/CES
5/13/2003	19:09	58	7.83	630	1.58	SMF
5/13/2003	23:11	58	7.86	630	1.35	CES
5/14/2003	3:10	58	7.79	620	1.40	CES
5/14/2003	7:04	58	7.81	630	1.52	SMF
5/14/2003	11:08	58	7.78	630	0.77	SMF
5/14/2003	15:09	60	7.79	650	0.98	SMF/JMT
5/14/2003	19:10	58	7.88	630	0.56	JMT
5/14/2003	23:04	58	7.86	650	1.00	JMT
5/15/2003	3:00	57	7.90	630	0.18	JMT
5/15/2003	6:55	57	7.91	650	0.51	JMT
5/15/2003	10:45	60	7.84	640	1.19	JMT

Notes:
F - degrees Fahrenheit
uS - microSiemens
NTUs - nephelometric turbidity units

Route 376 Properties
TW-3 72-Hour Constant-rate Pumping Test
SW-2 Field Water Quality Data

Date	Time	Temp (F)	pH	Conductivity (uS)	Turbidity NTUs	Tester
5/12/2003	11:30	60	7.74	740	1.88	JNK/SMF
5/12/2003	15:05	60	8.16	770	2.37	SMF
5/12/2003	19:04	60	8.12	740	2.28	SMF
5/12/2003	23:20	60	8.08	740	2.05	JNK
5/13/2003	3:15	59	8.06	750	2.00	JNK
5/13/2003	7:20	58	8.07	760	1.94	JNK
5/13/2003	11:05	57	8.11	780	1.78	JNK/SMF
5/13/2003	15:05	59	8.21	760	1.78	SMF/CES
5/13/2003	19:02	59	8.18	760	1.85	SMF
5/13/2003	23:05	59	8.11	760	2.17	CES
5/14/2003	2:58	59	8.17	760	1.91	CES
5/14/2003	6:57	57	8.09	770	2.02	SMF
5/14/2003	11:05	58	8.15	770	1.07	SMF
5/14/2003	15:05	58	8.18	750	1.01	SMF/JMT
5/14/2003	19:06	58	8.12	770	1.05	JMT
5/14/2003	23:04	58	8.10	790	1.00	JMT
5/15/2003	3:00	56	8.09	780	0.96	JMT
5/15/2003	7:00	56	8.07	785	1.40	JMT
5/15/2003	11:00	58	8.14	790	0.98	JMT

Notes:
F - degrees Fahrenheit
uS - microSiemens
NTUs - nephelometric turbidity units


Route 376 Properties
TW-3 72-Hour Constant-rate Pumping Test
TW-3 & SW-2 Temperature
Temperature (F)
65
64
63
62
61
60
59
58
57
56
55
Well TW-3
Stream Gage SW-2
5/12/03 0:00
5/12/03 12:00
5/13/03 0:00
5/13/03 12:00
5/14/03 0:00
5/14/03 12:00
5/15/03 0:00
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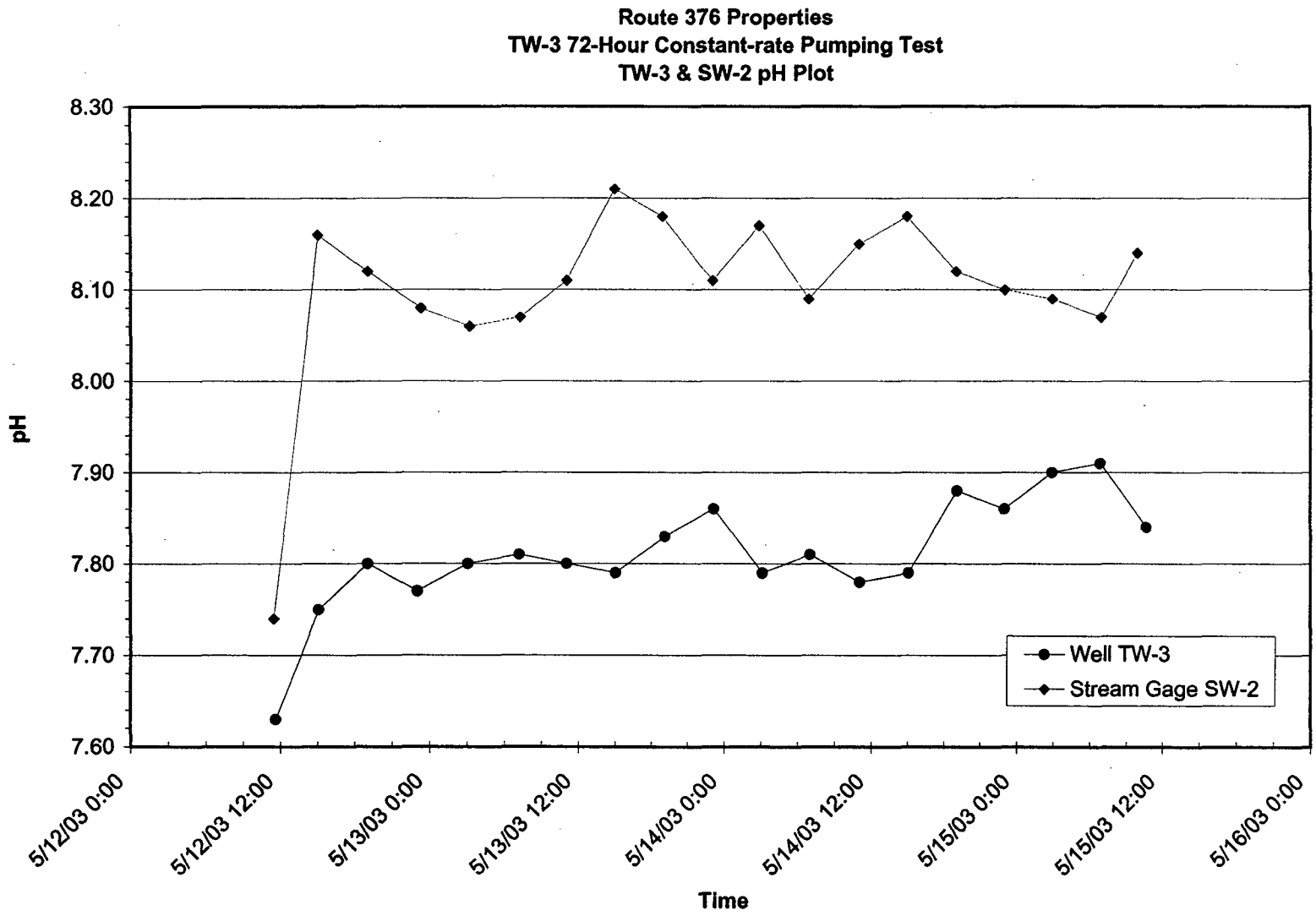
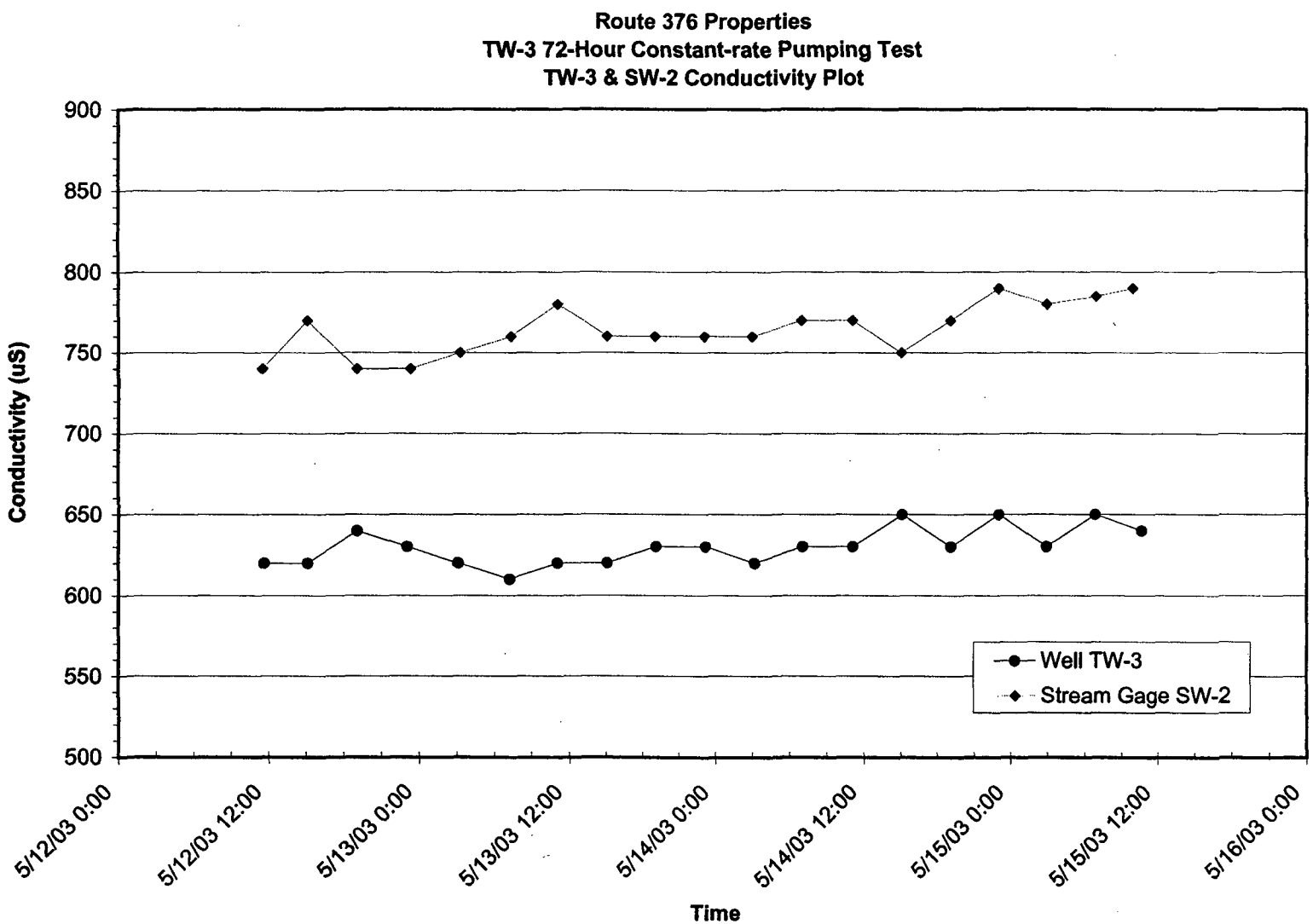
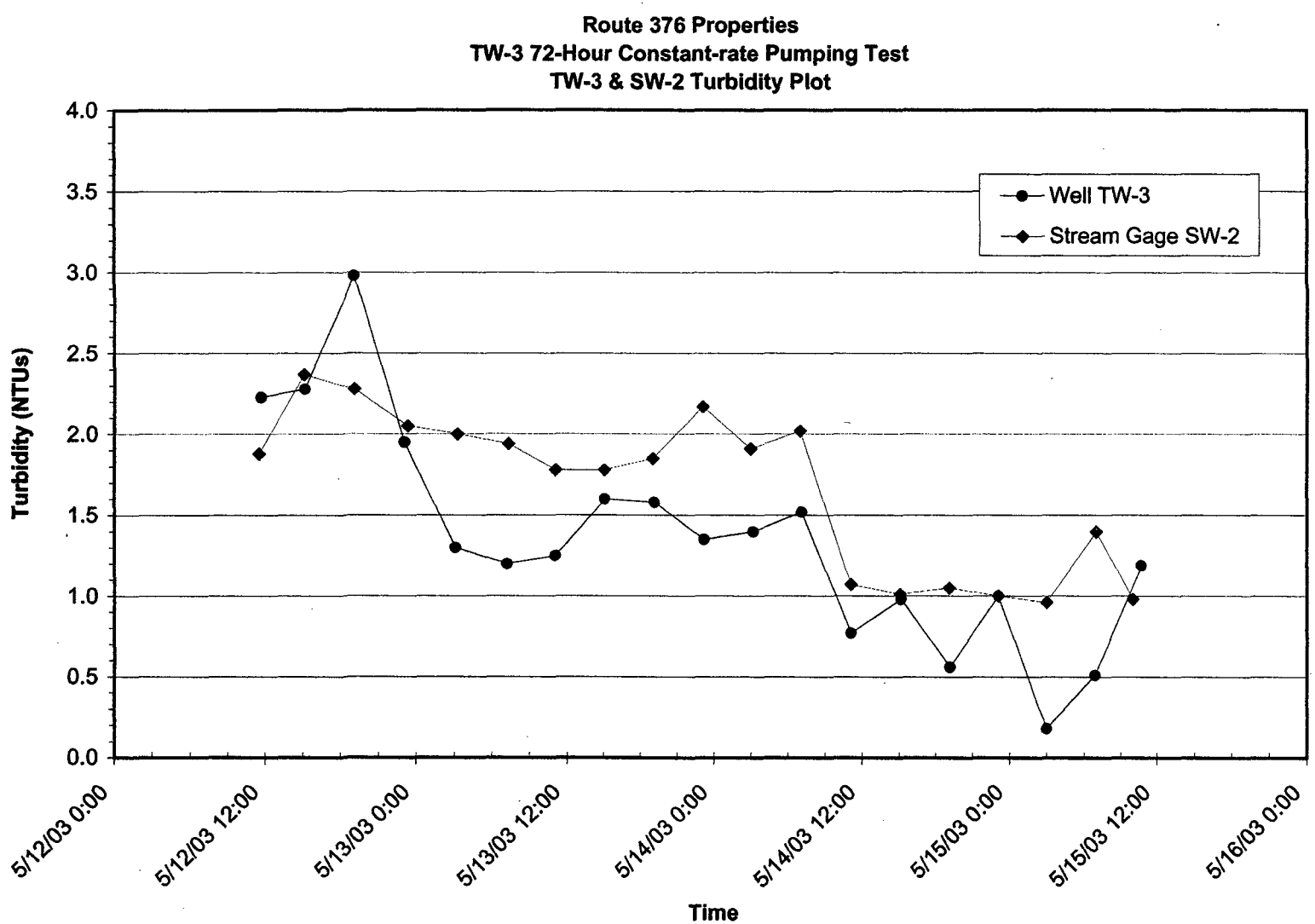
5/16/03 0:00
Time


Route 376 Properties
TW-3 72-Hour Constant-rate Pumping Test
TW-3 & SW-2 pH Plot
8.30
8.20
8.10
8.00
7.90
7.80
7.70
7.60
pH
5/12/03 0:00
5/12/03 12:00
5/13/03 0:00
5/13/03 12:00
5/14/03 0:00
5/14/03 12:00
5/15/03 0:00
5/15/03 12:00
5/16/03 0:00
Time
Well TW-3
Stream Gage SW-2


Route 376 Properties
TW-3 72-Hour Constant-rate Pumping Test
TW-3 & SW-2 Conductivity Plot
Conductivity (uS)
900
850
800
750
700
650
600
550
500
5/12/03 0:00
5/12/03 12:00
5/13/03 0:00
5/13/03 12:00
5/14/03 0:00
5/14/03 12:00
5/15/03 0:00
5/15/03 12:00
5/16/03 0:00
Time
Well TW-3
Stream Gage SW-2


Route 376 Properties
TW-3 72-Hour Constant-rate Pumping Test
TW-3 & SW-2 Turbidity Plot
Turbidity (NTUs)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Well TW-3
Stream Gage SW-2
5/12/03 0:00
5/12/03 12:00
5/13/03 0:00
5/13/03 12:00
5/14/03 0:00
5/14/03 12:00
5/15/03 0:00
5/15/03 12:00
5/16/03 0:00
Time

TW-2A Test Field Water Quality Data

Route 376 Properties
TW-2A 72-Hour Constant-rate Pumping Test
TW-2A Field Water Quality Data

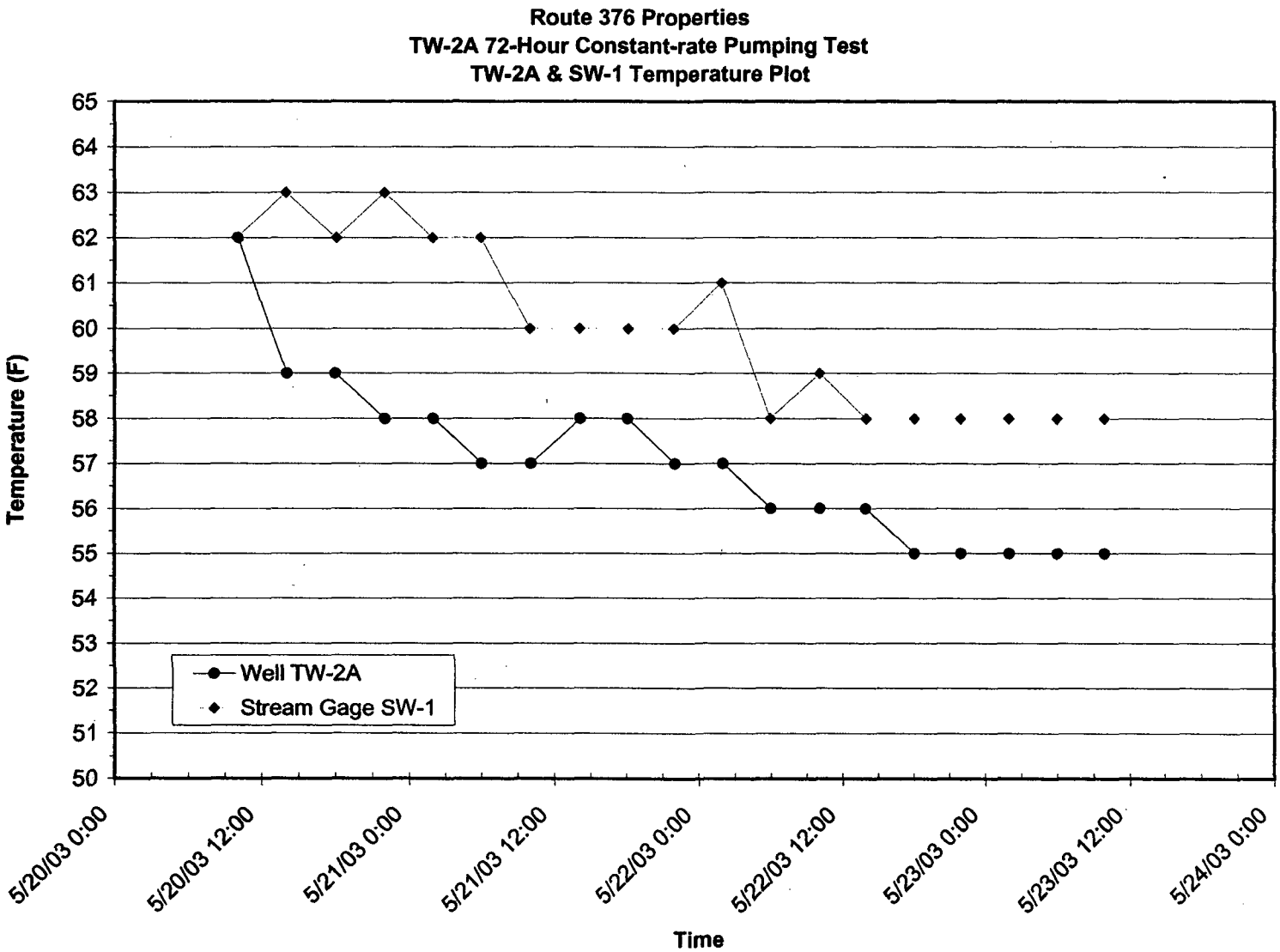
Date	Time	Temp (F)	pH	Conductivity (uS)	Turbidity NTUs	Tester
5/20/2003	10:06	62	7.53	1260	23.6	JMT
5/20/2003	14:05	59	7.49	1250	0.62	CES
5/20/2003	18:01	59	7.48	1250	0.67	SMF
5/20/2003	22:01	58	7.51	1290	0.40	CES
5/21/2003	2:01	58	7.54	1320	0.47	CES
5/21/2003	6:01	57	7.47	1310	0.48	CES
5/21/2003	10:05	57	7.39	1310	0.38	SMF
5/21/2003	14:08	58	7.36	1330	0.36	SMF
5/21/2003	18:05	58	7.37	1310	0.41	SMF
5/21/2003	22:01	57	7.35	1250	0.60	CES
5/22/2003	2:01	57	7.36	1240	0.35	CES
5/22/2003	6:01	56	7.34	1240	0.29	CES
5/22/2003	10:10	56	7.35	1260	0.12	SMF
5/22/2003	14:01	56	7.31	1260	0.15	SMF
5/22/2003	18:05	55	7.32	1270	0.36	SMF
5/22/2003	22:01	55	7.36	1220	0.31	CES
5/23/2003	2:01	55	7.36	1220	0.18	CES
5/23/2003	6:01	55	7.36	1210	0.11	CES
5/23/2003	9:55	55	7.35	1230	0.08	SMF

Notes:
F - degrees Fahrenheit
uS - microSiemens
NTUs - nephelometric turbidity units

Route 376 Properties
TW-2A 72-Hour Constant-rate Pumping Test
SW-1 Field Water Quality Data

Date	Time	Temp (F)	pH	Conductivity (uS)	Turbidity NTUs	Tester
5/20/2003	10:00	62	8.05	830	1.33	JMT
5/20/2003	13:58	63	8.21	830	2.04	CES
5/20/2003	18:06	62	8.16	840	1.48	SMF
5/20/2003	21:58	63	8.10	840	1.30	CES
5/21/2003	1:57	62	8.08	860	2.03	CES
5/21/2003	5:55	62	8.02	850	1.32	CES
5/21/2003	10:01	60	8.03	840	1.64	SMF
5/21/2003	14:05	60	7.89	840	1.12	SMF
5/21/2003	18:10	60	7.98	860	0.98	SMF
5/21/2003	21:55	60	7.92	850	0.95	CES
5/22/2003	1:55	61	7.88	840	1.04	CES
5/22/2003	5:55	58	7.96	840	0.88	CES
5/22/2003	10:05	59	7.93	850	2.09	SMF
5/22/2003	13:58	58	8.01	860	0.89	SMF
5/22/2003	18:01	58	8.01	860	0.76	SMF
5/22/2003	21:55	58	7.90	850	0.95	CES
5/23/2003	1:55	58	7.93	840	0.91	CES
5/23/2003	5:55	58	7.92	830	0.83	CES
5/23/2003	9:50	58	8.01	850	0.84	SMF

Notes:
F - degrees Fahrenheit
uS - microSiemens
NTUs - nephelometric turbidity units


Route 376 Properties
TW-2A 72-Hour Constant-rate Pumping Test
TW-2A & SW-1 Temperature Plot
Temperature (F)
65
64
63
62
61
60
59
58
57
56
55
54
53
52
51
50
Well TW-2A
Stream Gage SW-1
5/20/03 0:00
5/20/03 12:00
5/21/03 0:00
5/21/03 12:00
5/22/03 0:00
5/22/03 12:00
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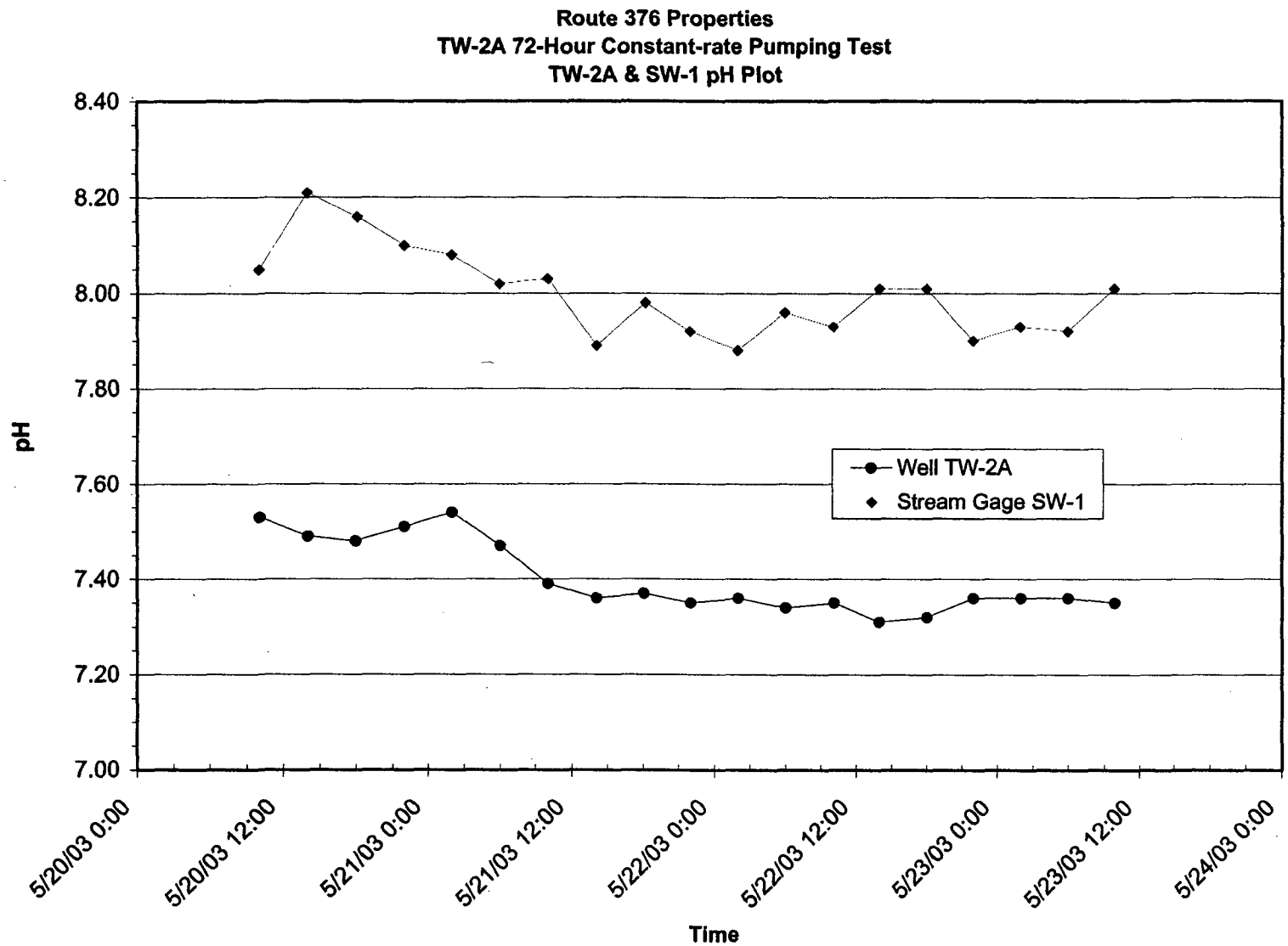
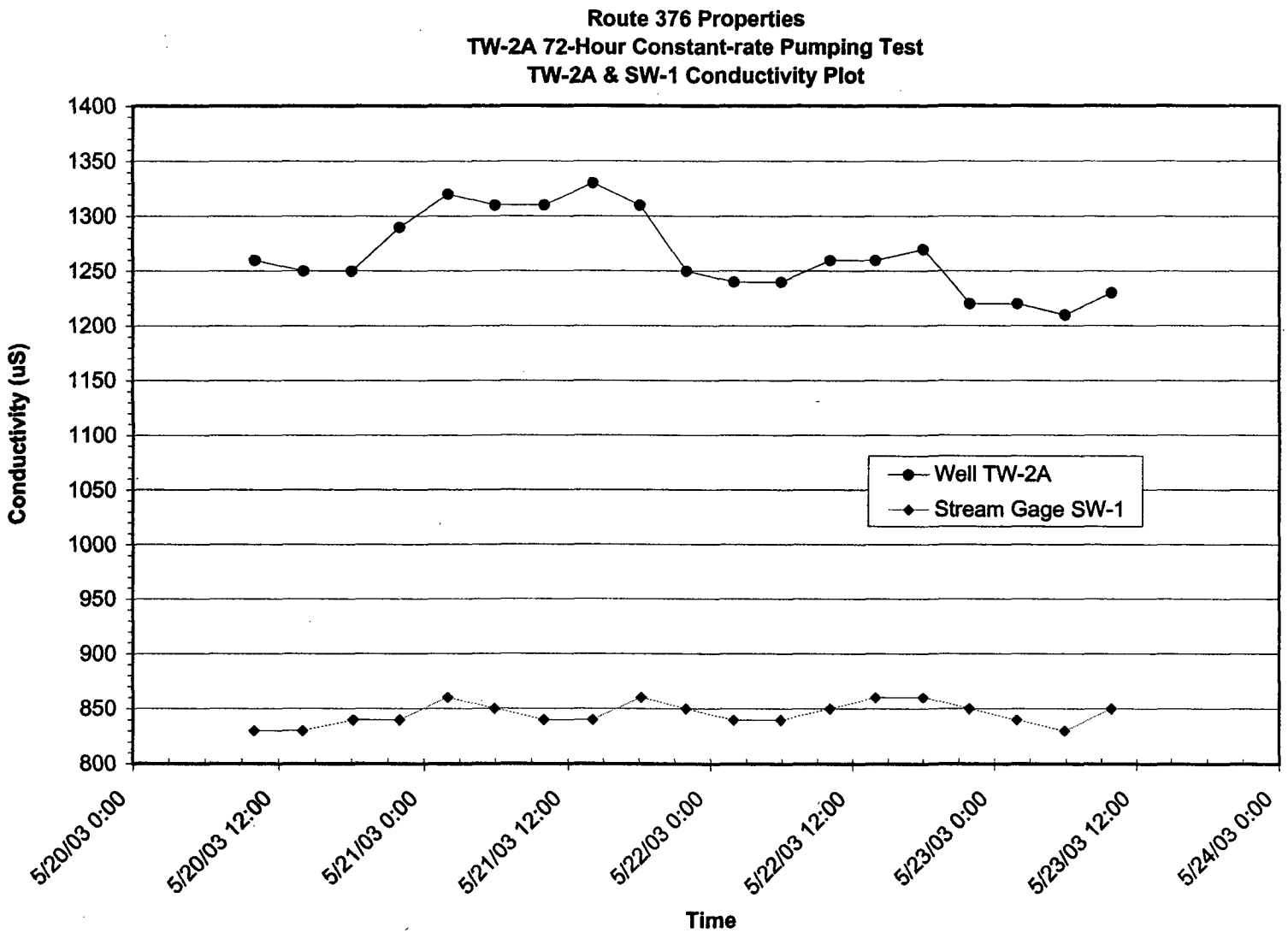
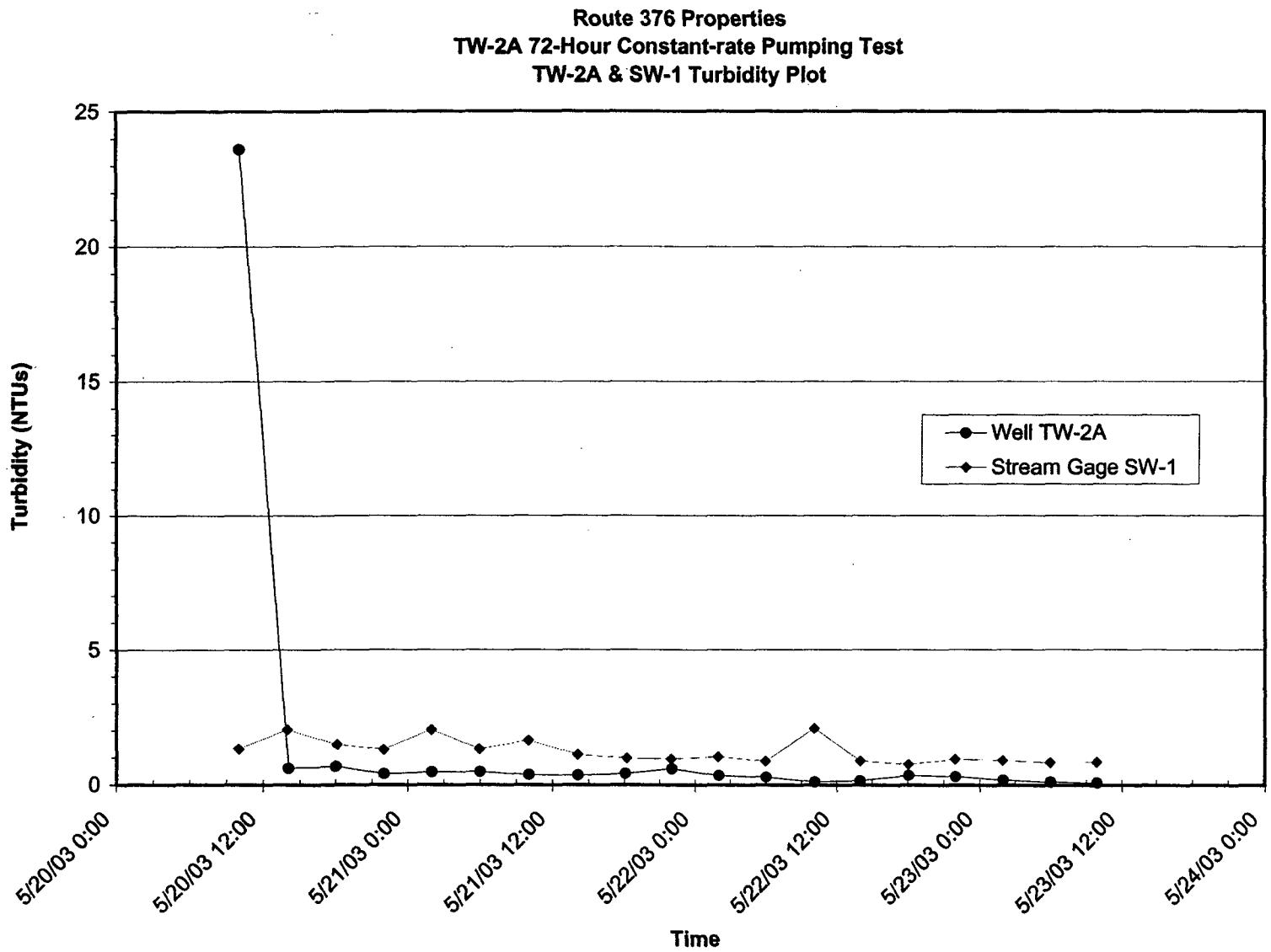
5/23/03 12:00
5/24/03 0:00
Time


Route 376 Properties
TW-2A 72-Hour Constant-rate Pumping Test
TW-2A & SW-1 pH Plot
8.40
8.20
8.00
7.80
7.60
7.40
7.20
7.00
pH
Well TW-2A
Stream Gage SW-1
5/20/03 0:00
5/20/03 12:00
5/21/03 0:00
5/21/03 12:00
5/22/03 0:00
5/22/03 12:00
5/23/03 0:00
5/23/03 12:00
5/24/03 0:00
Time


Route 376 Properties
TW-2A 72-Hour Constant-rate Pumping Test
TW-2A & SW-1 Conductivity Plot
Conductivity (uS)
1400
1350
1300
1250
1200
1150
1100
1050
1000
950
900
850
800
Well TW-2A
Stream Gage SW-1
5/20/03 0:00
5/20/03 12:00
5/21/03 0:00
5/21/03 12:00
5/22/03 0:00
5/22/03 12:00
5/23/03 0:00
5/23/03 12:00
5/24/03 0:00
Time


Route 376 Properties
TW-2A 72-Hour Constant-rate Pumping Test
TW-2A & SW-1 Turbidity Plot
Turbidity (NTUs)
25
20
15
10
5
0
Well TW-2A
Stream Gage SW-1
5/20/03 0:00
5/20/03 12:00
5/21/03 0:00
5/21/03 12:00
5/22/03 0:00
5/22/03 12:00
5/23/03 0:00
5/23/03 12:00
5/24/03 0:00
Time

TW-4AD 72-Hr Test #1 Field Water Quality Data

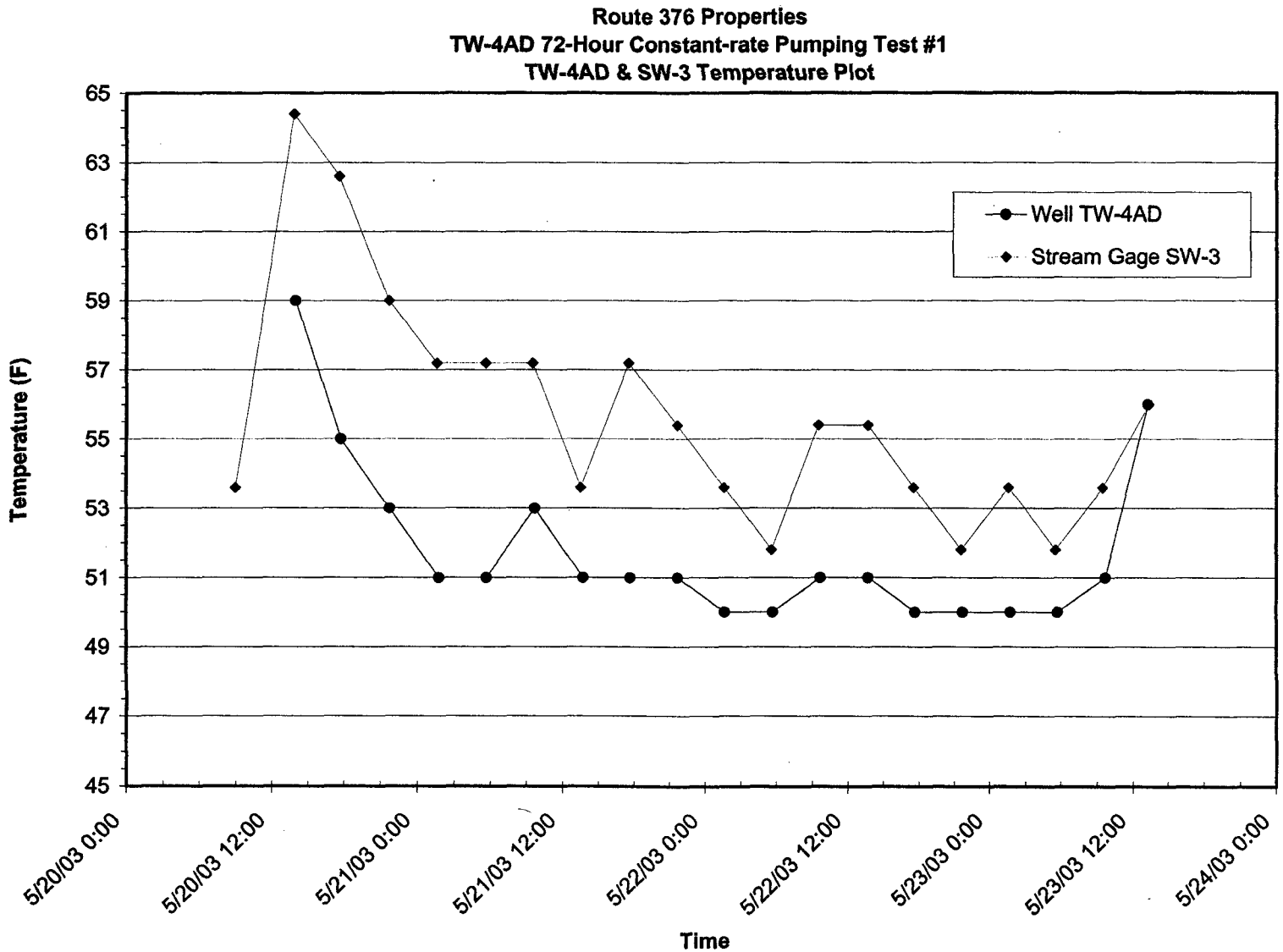
Route 376 Properties TW-4AD 72-Hour Constant-rate Pumping Test #1 TW-4AD Field Water Quality Data						
Date	Time	Temp (F)	pH	Conductivity (uS)	Turbidity NTUs	Tester
5/20/2003	14:00	59	8.02	500	7.51	JMT
5/20/2003	17:44	55	7.94	530	1.64	KLT
5/20/2003	21:47	53	7.93	550	1.71	KLT
5/21/2003	1:45	51	7.88	560	1.80	KLT
5/21/2003	5:40	51	7.87	570	1.29	KLT
5/21/2003	9:42	53	7.86	570	1.96	JMT
5/21/2003	13:43	51	7.90	560	0.77	JMT
5/21/2003	17:41	51	7.94	560	1.11	JMT
5/21/2003	21:43	51	7.93	580	0.32	KLT
5/22/2003	1:42	50	7.77	580	0.40	KLT
5/22/2003	5:43	50	7.10	590	0.34	KLT
5/22/2003	9:41	51	7.42	580	0.73	JMT
5/22/2003	13:44	51	7.78	590	0.77	JMT
5/22/2003	17:41	50	7.90	570	1.52	JMT
5/22/2003	21:43	50	7.82	580	0.78	KLT
5/23/2003	1:44	50	7.86	590	1.17	KLT
5/23/2003	5:43	50	7.87	590	0.77	JMT
5/23/2003	9:41	51	7.90	590	3.15	JMT
5/23/2003	13:15	56	7.69	600	0.76	SMF

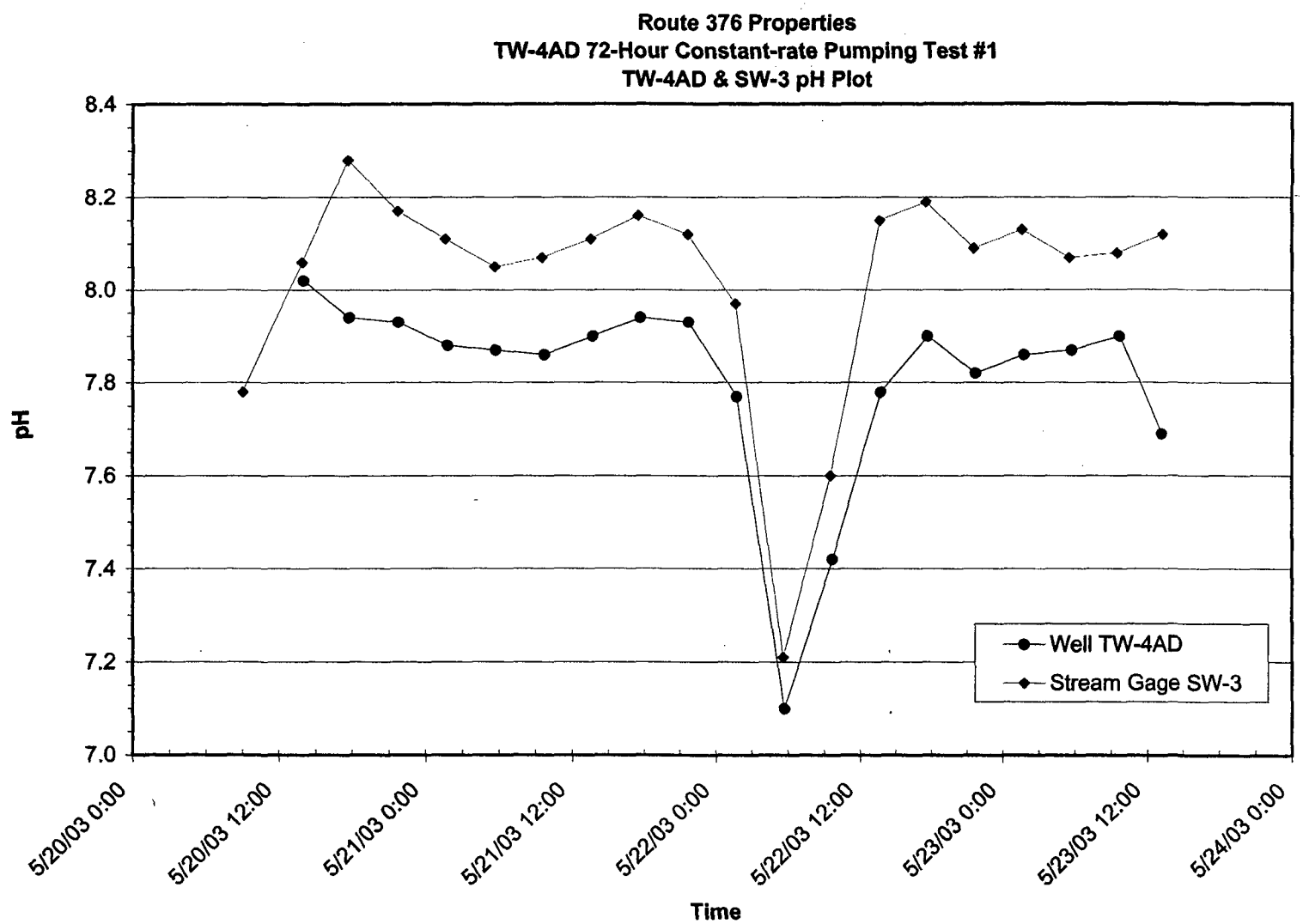
Notes:
F - degrees Fahrenheit
uS - microSiemens
NTUs - nephelometric turbidity units

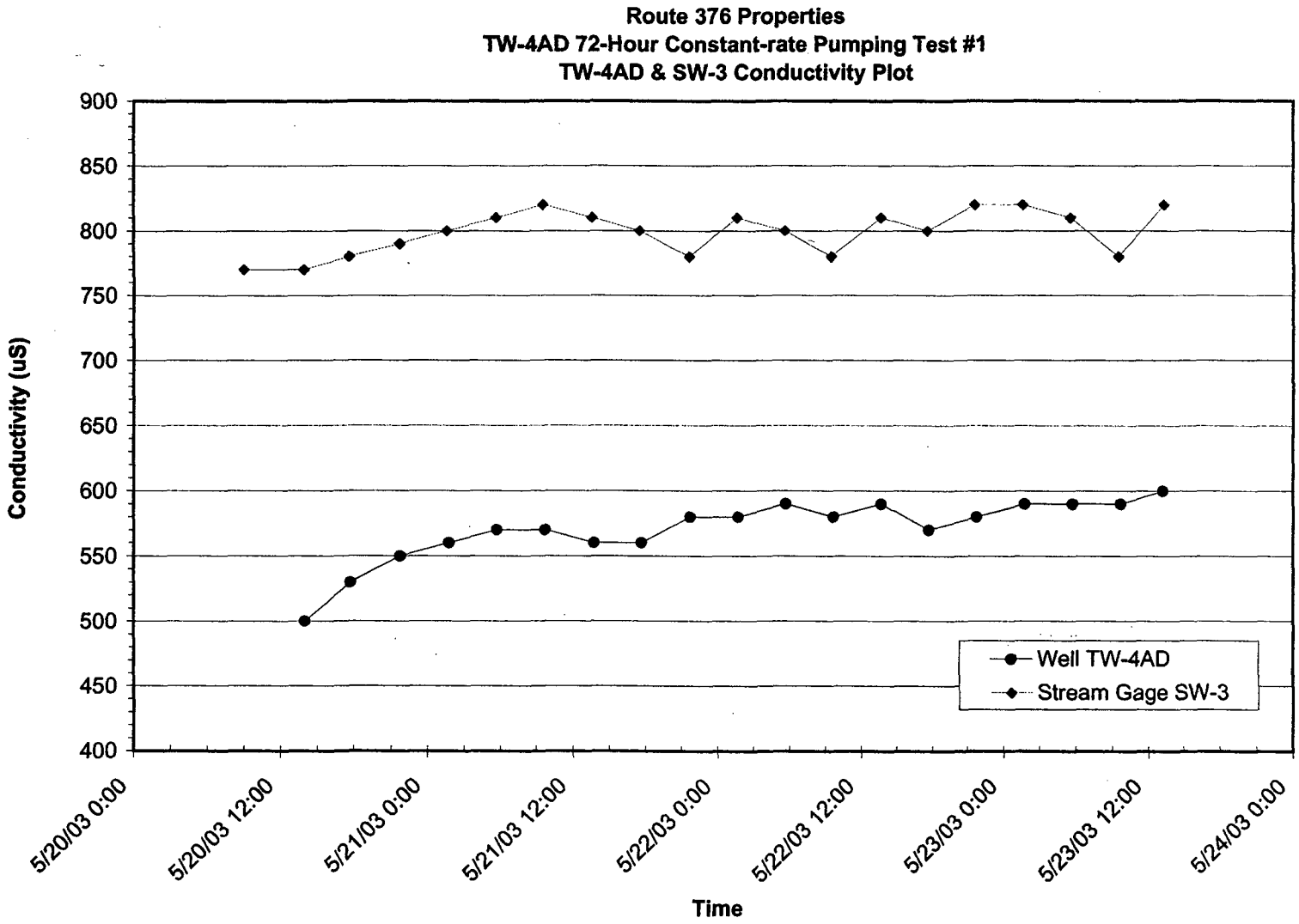
Route 376 Properties
TW-4AD 72-Hour Constant-rate Pumping Test #1
SW-3 Field Water Quality Data

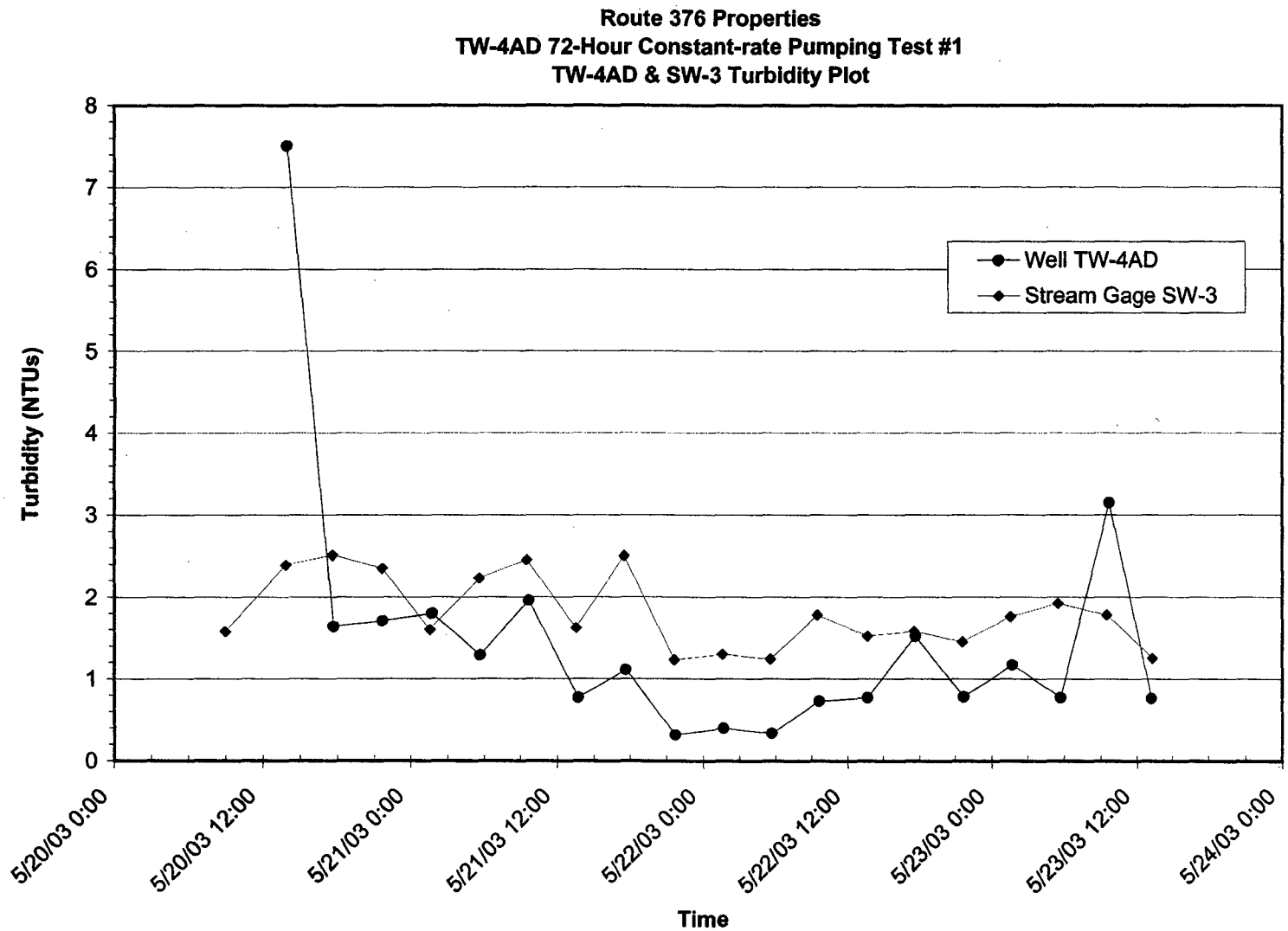
Date	Time	Temp (F)	pH	Conductivity (uS)	Turbidity NTUs	Tester
5/20/2003	9:00	53	7.78	770	1.58	JMT
5/20/2003	13:54	64	8.06	770	2.39	JMT
5/20/2003	17:37	62	8.28	780	2.51	KLT
5/20/2003	21:42	59	8.17	790	2.35	KLT
5/21/2003	1:35	57	8.11	800	1.6	KLT
5/21/2003	5:36	57	8.05	810	2.23	KLT
5/21/2003	9:31	57	8.07	820	2.45	JMT
5/21/2003	13:32	53	8.11	810	1.62	JMT
5/21/2003	17:31	57	8.16	800	2.5	JMT
5/21/2003	21:40	55	8.12	780	1.23	KLT
5/22/2003	1:37	53	7.97	810	1.3	KLT
5/22/2003	5:36	51	7.21	800	1.24	KLT
5/22/2003	9:31	55	7.60	780	1.78	JMT
5/22/2003	13:42	55	8.15	810	1.52	JMT
5/22/2003	17:35	53	8.19	800	1.58	JMT
5/22/2003	21:36	51	8.09	820	1.45	KLT
5/23/2003	1:36	53	8.13	820	1.76	KLT
5/23/2003	5:32	51	8.07	810	1.92	JMT
5/23/2003	9:29	53	8.08	780	1.78	JMT
5/23/2003	13:20	56	8.12	820	1.25	SMF

Notes:
F - degrees Fahrenheit
uS - microSiemens
NTUs - nephelometric turbidity units


Route 376 Properties
TW-4AD 72-Hour Constant-rate Pumping Test #1
TW-4AD & SW-3 Temperature Plot
Temperature (F)
65
63
61
59
57
55
53
51
49
47
45
Well TW-4AD
Stream Gage SW-3
5/20/03 0:00
5/20/03 12:00
5/21/03 0:00
5/21/03 12:00
5/22/03 0:00
5/22/03 12:00
5/23/03 0:00
5/23/03 12:00
5/24/03 0:00
Time


Route 376 Properties
TW-4AD 72-Hour Constant-rate Pumping Test #1
TW-4AD & SW-3 pH Plot
8.4
8.2
8.0
7.8
7.6
7.4
7.2
7.0
pH
5/20/03 0:00
5/20/03 12:00
5/21/03 0:00
5/21/03 12:00
5/22/03 0:00
5/22/03 12:00
5/23/03 0:00
5/23/03 12:00
5/24/03 0:00
Time
Well TW-4AD
Stream Gage SW-3


Route 376 Properties
TW-4AD 72-Hour Constant-rate Pumping Test #1
TW-4AD & SW-3 Conductivity Plot
Conductivity (uS)
900
850
800
750
700
650
600
550
500
450
400
5/20/03 0:00
5/20/03 12:00
5/21/03 0:00
5/21/03 12:00
5/22/03 0:00
5/22/03 12:00
5/23/03 0:00
5/23/03 12:00
5/24/03 0:00
Time
Well TW-4AD
Stream Gage SW-3


Route 376 Properties
TW-4AD 72-Hour Constant-rate Pumping Test #1
TW-4AD & SW-3 Turbidity Plot
Turbidity (NTUs)
0
1
2
3
4
5
6
7
8
Well TW-4AD
Stream Gage SW-3
5/20/03 0:00
5/20/03 12:00
5/21/03 0:00
5/21/03 12:00
5/22/03 0:00
5/22/03 12:00
5/23/03 0:00
5/23/03 12:00
5/24/03 0:00
Time

APPENDIX C-3

Mobil Site and State Road Site

Geologic Services Corporation
science, engineering & technology

February 10, 2003

Mr. Vincent McCabe
NYSDEC, Region 3
21 South Putt Corner Road
New Paltz, NY 12561-1696

RE: NYSDEC Case No. 96-03840
Texaco Service Station
Location No. 138621
Route 52 and Blue Hill Road
Hopewell Junction, NY 12533

Dear Mr. McCabe:

Enclosed please find the Quarterly Groundwater Monitoring Report (QGMR) for the above referenced location. Geologic Services Corporation is submitting the QGMR on behalf of Motiva Enterprises, LLC (Motiva).

Please note, in March 2000, Motiva Enterprises, LLC (Motiva) removed four USTs from the Site. Following the removal of the USTs, Motiva divested the Site to the current owner. The current Site USTs system is not owned or operated by Motiva. In the December 2002, in the potable water sample collected from 128 Blue Hill Road, MTBE was detected at a concentration of 29.2 µg/l. On January 10, 2003 a confirmation sample was collected, MTBE was detected at a concentration of 12.3 µg/l. The residence that occupies 128 Blue Hill Road has been notified of the detections and supplied with bottled water. Please note potable water samples have been collected monthly from 128 Blue Hill Road since May 2001and MTBE was 1.2 µg/l in May 2001and less than 1 µg/l for over 1 year until recently

An increasing trend of MTBE concentrations in potable water has been observed at 2421 and 2427 Route 52. In February 2001, an MTBE concentration of 158 ug/l was observed in the potable water at 2421 Route 52. Prior to that date, MTBE had not been observed above 43 ug/l. In December 2002, an MTBE concentration of 235 ug/l was detected; this is the highest historical MTBE concentration detected in the potable water at 2421 Route 52. At 2427 Route 52 an MTBE concentration of 161 ug/l was observed in July 2000 in the potable water. Prior to that date, MTBE had not been observed above 83 ug/l. In September 2002, an MTBE concentration of 515 ug/l was detected; this is the highest historical MTBE concentration detected in the potable water at 2427 Route 52. Please note, at 2421 and 2427 Route 52 the highest historical MTBE concentrations have been detected within in the last 6 months. Also note, as depicted graphically in Figures 4 and 5, the increasing trends of MTBE begin following the removal of the Motiva owned USTs in March 2000. Based on this data, it is the belief of Motiva the increasing trends of MTBE concentrations in the above-mentioned potable wells, is attributable to the current Site UST system. Motiva respectfully requests the owner of the current Site UST system take full responsibility of the sampling and maintenance for the treatment systems located at 2421 and 2427 Route 52, as well as sampling, bottled water delivery and possible system installation for 128 Blue Hill Road.

Should you have any questions or comments regarding the enclosed, please feel free to contact me at (845) 561-9890.

Very truly yours,
Geologic Services Corporation

Timothy J. Fisher
Project Manager

Enclosure

cc: Mr. Robert E. Rule, Motiva Enterprises, LLC
Cesare Manfredi - New York State Department of Environmental Conservation
Peter Doshna – New York State Department of Environmental Conservation
Joan Carter, Dutchess County Department of Health
File

MOTIVA ENTERPRISES, LLC
SITE STATUS UPDATE REPORT

Site: Former Shell Facility No. 138621 Route 52 and Blue Hill Road East Fishkill, NY	**Regulatory Agency:** NYSDEC, Region 3 **Regulatory Contact:** Vincent McCabe **Case No.:** 96-03840 **Consultant:** Geologic Services Corporation
Motiva Contact: Robert Rule	**Project Manager/ Environmental Scientist:** Timothy J. Fisher/Maureen P. Sacchetti

Report Date: February 10, 2003

Current Site Status: Currently an operating Mobil retail gasoline facility.

Monitoring Period: October through December 2002.

Work Performed: Gauged and sampled four (4) wells on December 4, 2002.

Conducted monthly sampling of potable wells in October, November, and December 2002.

Groundwater Monitoring:

Number of Wells:	5
Containing LPH:	0
Gauging Frequency:	Quarterly
Sampling Frequency:	Quarterly
Groundwater Depth:	17.75 to 20.48 feet
Groundwater Flow:	Northwest
Groundwater Gradient:	0.048 ft/ft
Maximum BTEX Concentration:	668 µg/l (MW-6)
Maximum MTBE Concentration:	47.5 µg/l (MW-6)

Potential Sensitive Receptors: On-Site potable well and residential potable wells in the vicinity of the Site. Buildings with basements are also located in the vicinity of the Site. Gayhead Pond is located approximately 1,000 ft to the northeast of the Site. Located approximately 1,000 ft east and west of the Site are two unnamed streams.

Comments: MW-7 is an overburden monitoring well and is not considered in determining groundwater gradient. Snow and ice prevented access to MW-7 therefore a sample was not obtained.

Please note, in March 2000, Motiva Enterprises, LLC (Motiva) removed four USTs from the Site. Following the removal of the USTs, Motiva divested the Site to the current owner. The current Site USTs system is not owned or operated by Motiva. In the December 2002, in the potable water sample collected from 128 Blue Hill Road, MTBE was detected at a concentration of 29.2 µg/l. On January 10, 2003 a confirmation sample was collected, MTBE was detected at a concentration of 12.3 µg/l. The residence that occupies 128 Blue Hill Road has been notified of the detections and supplied with bottled water. Please note potable water samples have been collected monthly from 128 Blue Hill Road since May 2001and MTBE was 1.2 µg/l in May 2001and less than 1 µg/l for over 1 year until recently

An increasing trend of MTBE concentrations in potable water has been observed at 2421 and 2427 Route 52. In February 2001, an MTBE concentration of 158 ug/l was observed in the potable water at 2421 Route 52. Prior to that date, MTBE had not been observed above 43 ug/l. In December 2002, an MTBE concentration of 235 ug/l was detected; this is the highest historical MTBE concentration detected in the potable water at 2421 Route 52. At 2427 Route 52 an MTBE concentration of 161 ug/l was observed in July 2000 in the potable water. Prior to that date, MTBE had not been observed above 83 ug/l. In September 2002, an MTBE concentration of 515 ug/l was detected; this is the highest historical MTBE concentration detected in the potable water at 2427 Route 52. Please note, at 2421 and 2427 Route 52 the highest historical MTBE concentrations have been detected within in the last 6 months. Also note, as depicted graphically in Figures 4 and 5, the increasing trends of MTBE begin following the removal of the Motiva owned USTs in March 2000. Based on this data, it is the belief of Motiva the increasing trends of MTBE concentrations in the above-mentioned potable wells, is attributable to the current Site UST system. Motiva respectfully requests the owner of the current Site UST system take full responsibility of the sampling and maintenance for the treatment systems located at 2421 and 2427 Route 52, as well as sampling, bottled water delivery and possible system installation for 128 Blue Hill Road.

List of Attachments:

Tables:

- Table 1 – Historical Summary of Groundwater Quality
- Table 2 – Summary of Water Quality - 124 Blue Hill Road
- Table 3 – Summary of Water Quality - 128 Blue Hill Road
- Table 4 – Summary of Water Quality - Service Station
- Table 5 – Summary of Water Quality - 2421 Route 52
- Table 6 – Summary of Water Quality - 2424 Route 52
- Table 7 – Summary of Water Quality - 2427 Route 52
- Table 8 – Summary of Water Quality - 110 Old State Road
- Table 9 – Summary of Water Quality - 116 Old State Road

Figures:

- Figure 1 – Area Map
- Figure 2 – Hydrocarbon Distribution/ Groundwater Contour Map
- Figure 3 – Summary of Water Quality – 128 Blue Hill Road
- Figure 4 – Summary of Water Quality – 2421Route 52
- Figure 5 – Summary of water Quality – 2427 Route 52

Appendices:

- Appendix A – Laboratory Sample Analytical Report and Chain of Custody-Groundwater Data
- Appendix B – Laboratory Sample Analytical Report and Chain of Custody-Potable Well Data

Timothy J Fisher — Date 2/10/03
Project Manager

Maureen P. Sacchetti — Date 2/10/03
Environmental Scientist

TABLES

TABLE 1
Historical Summary of Groundwater Quality

Route 52 and Bluehill Road
East Fishkill, New York

Well ID	Sample Date	Benzene	Toluene	Ethylbenzene	Total Xylenes[a]	Total BTEX[b]	MTBE[c]	Depth to Water[d]	Water Table Elevation[e]
MW-1	5-Dec-96	1	BDL	2	20	23	43	14.89	255.11
	5-Dec-97	BDL	BDL	BDL	BDL	BDL	33	11.10	258.90
	23-Nov-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	15-Mar-01	24	4	43	132	204	459	16.26	NC
	13-Sep-01	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	7-Dec-01	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	21-Mar-02	Well Abandoned							
MW-2	5-Dec-96	BDL	BDL	BDL	BDL	BDL	12	11.00	262.86
	5-Dec-97	BDL	BDL	BDL	BDL	BDL	13	12.53	261.33
	23-Nov-98	BDL	BDL	BDL	BDL	BDL	2	15.50	258.36
	9-Dec-99	<1	3	2	5	10	47	11.88	261.98
	15-Mar-01	Well Abandoned							
MW-3	5-Dec-96	BDL	BDL	BDL	BDL	BDL	11	10.42	260.15
	5-Dec-97	NS	NS	NS	NS	NS	NS	NG	NC
	23-Nov-98	NS	NS	NS	NS	NS	NS	18.75	251.82
	15-Mar-01	<1	<1	<1	<5	BDL	2	12.34	NC
	13-Sep-01	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	7-Dec-01	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	21-Mar-02	Well Abandoned							
MW-4	13-Sep-01	<1.0	<1.0	<1.0	BDL	BDL	5.5	24.65	75.49
	7-Dec-01	<1.0	<1.0	0.43J	2.5	3	15.4	22.51	77.63
	21-Mar-02	<1.0	<1.0	<1.0	<1.4	BDL	9.7	19.21	80.93
	17-Jun-02	<1.0	7.8	<1.0	<1.0	8	2.6	13.89	86.25
	4-Sep-02	<1.0	<1.0	<1.0	<1.0	BDL	1.9	18.76	81.38
	4-Dec-02	<1.0	<1.0	<1.0	<1.0	BDL	2.1	17.78	82.36
MW-5	13-Sep-01	85.6	17.2	137	404	644	339	24.44	72.37
	7-Dec-01	21.1	7.8	31.6	273	334	114	22.68	74.13
	21-Mar-02	3.0	1.2	4.5	38.9	48	11.1	19.04	77.77
	17-Jun-02	0.93	<1.0	<1.0	<1.0	1	1.6	13.31	83.50
	4-Sep-02	<1.0	<1.0	<1.0	<1.0	BDL	2.2	19.15	77.66
	4-Dec-02	<1.0	<1.0	<1.0	<1.0	BDL	4.3	17.75	79.06
MW-6	13-Sep-01	109	114	265	978	1,466	77.4	23.94	75.70
	7-Dec-01	104	64.4	155	420	743	61.6	23.13	76.51
	21-Mar-02	211	24.6	148	303	687	82.4	21.70	77.94
	17-Jun-02	208	11.2	313	336	868	65.7	15.04	84.60
	4-Sep-02	209	20.1	307	225	761	49.5	21.93	77.71
	4-Dec-02	132	8.9	265	262	668	47.5	18.93	80.71
MW-7	13-Sep-01	<1.0	<1.0	1	3.1	4	87.4	25.94	75.78
	7-Dec-01	<1.0	<1.0	<1.0	<1.0	BDL	5.2	25.08	76.64
	21-Mar-02	<1.0	<1.0	<1.0	<1.4	BDL	3.5	24.32	77.40
	17-Jun-02	<1.0	<1.0	<1.0	<1.0	BDL	1.2	15.67	86.05
	4-Sep-02	<1.0	<1.0	<1.0	<1.0	BDL	1.8	24.86	76.86
	4-Dec-02	NS	NS	NS	NS	NS	NS	NG	NC
MW-9	13-Sep-01	<1.0	1.0	0.89	3.0	5	3.5	23.30	77.65
	7-Dec-01	<1.0	<1.0	<1.0	<1.0	BDL	3.5	23.42	77.53
	21-Mar-02	<1.0	<1.0	<1.0	<1.4	BDL	2.1	22.27	78.68
	17-Jun-02	<1.0	<1.0	<1.0	<1.0	BDL	<1.0	15.91	85.04
	4-Sep-02	<1.0	<1.0	<1.0	<1.0	BDL	<1.0	22.44	78.51
	4-Dec-02	<1.0	<1.0	<1.0	<1.0	BDL	<1.0	20.48	80.47
NYSDEC Standards[f]		0.7	5	5	5	NA	10	NA	NA

Notes:

All concentrations are presented in micrograms per liter (ug/L).

[a] - Sum of m, p-Xylenes and o-Xylenes.

[b] - Rounded sum total of Benzene, Toluene, Ethylbenzene, and Total Xylenes concentrations.

[c] - Methyl Tertiary Butyl Ether

[d] - Depth in feet, from top of casing

[e] - Presented in feet

[f] - NYSDEC Ambient Water Quality Standards and/or Guidance Values

NA - Not Applicable

NC - Not calculated

NS - Not sampled

BDL - Below method detection limits

DRY - Insufficient amount of water for sampling

Bold - Indicates value exceeds NYSDEC Ambient Water Quality Standards and/or Guidance Values.

TABLE 2
Summary of Water Quality - 124 Blue Hill Road

124 Blue Hill Road
(Formerly 15 Blue Hill Rd)
East Fishkill, New York

Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes[a]	BTEX[b]	MTBE[c]
17-Apr-01	15 Blue Hill Road	ND	ND	ND	ND	BDL	4.8
31-May-01	15 Blue Hill Road - OT	ND	ND	ND	ND	BDL	1.0
	15 Blue Hill Road - IT	ND	ND	ND	ND	BDL	ND
21-Jun-01	15 Blue Hill Road - OT	ND	ND	ND	ND	BDL	1.4
	15 Blue Hill Road - IT	ND	ND	ND	ND	BDL	ND
30-Jul-01	15 Blue Hill Road - OT	<1.0	<1.0	<1.0	<1.0	BDL	0.38J
	15 Blue Hill Road - IT	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
31-Aug-01	124 Blue Hill Road - OT	<1.0	0.3J	<1.0	<1.0	BDL	0.29J
	124 Blue Hill Road - IT	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
27-Sep-01	124 Blue Hill Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	124 Blue Hill Road - Sink	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
23-Oct-01	124 Blue Hill Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	124 Blue Hill Road - Sink	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
20-Nov-01	124 Blue Hill Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	124 Blue Hill Road - Sink	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Dec-01	124 Blue Hill Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	124 Blue Hill Road - Sink	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
16-Jan-02	IT - 124 Blue Hill Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
15-Feb-02	OT - 124 Blue Hill Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
21-Mar-02	OT - 124 Blue Hill Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Apr-02	OT - 124 Blue Hill Road	<1.0	<1.0	<1.0	<1.0	BDL	0.37J
13-May-02	OT - 124 Blue Hill Road	<1.0	<1.0	<1.0	<1.0	BDL	1.6
17-Jun-02	OT - 124 Blue Hill Road	<1.0	<1.0	<1.0	<1.0	BDL	2.0
18-Jul-02	OT-124 BLUE HILL	<1.0	<1.0	<1.0	<1.0	BDL	0.69J
19-Aug-02	OT-124 BLUE HILL	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Sep-02	OT-124 BLUE HILL	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
17-Oct-02	OT-124 BLUE HILL	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
19-Nov-02	OT-124 BLUE HILL	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Dec-02	OT-124 BLUE HILL	<0.50	<0.50	<0.50	<0.50	BDL	0.19J
NYSDEC Standards[d]		**0.7**	**5**	**5**	**5**	NA	**10**

Notes:

All constituent concentrations are presented in micrograms per liter (ug/L).

[a] - Sum of m, p-Xylenes and o-Xylenes.

[b] - Sum of Benzene, Toluene, Ethylbenzene, and Total Xylenes.

[c] - Methyl Tertiary Butyl Ether

[e] - Sample due to previous exceedence

[d] - NYSDEC Standards - NYSDEC Ambient Water Quality Standards and/or Guidance Values

J - Indicates an estimated value.

BDL - Below detection limit

DW - Drinking Water

NA - Not applicable

Bold - Indicates value exceeds NYSDEC Ambient Water Quality Standards and/or Guidance Values.

TABLE 3
Summary of Water Quality - 128 Blue Hill Road

128 Blue Hill Road
(Formerly 19 Blue Hill Road)
East Fishkill, New York

Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes[a]	BTEX[b]	MTBE[c]
31-May-01	19 Blue Hill Road - OT	ND	ND	ND	ND	BDL	1.2
21-Jun-01	19 Blue Hill Road - OT	ND	ND	ND	ND	BDL	0.84J
30-Jul-01	19 Blue Hill Road - OT	<1.0	<1.0	<1.0	<1.0	BDL	0.53J
31-Aug-01	128 Blue Hill Road - OT	<1.0	0.26J	<1.0	<1.0	BDL	<1.0
27-Sep-01	128 Blue Hill Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
23-Oct-01	125 Blue Hill- Outside Tap	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
20-Nov-01	125 Blue Hill- Outside Tap	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Dec-01	125 Blue Hill- Outside Tap	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
16-Jan-02	OT-128 Blue Hill	<1.0	<1.0	<1.0	<1.0	BDL	0.46J
15-Feb-02	OT-128 Blue Hill	<1.0	<1.0	<1.0	<1.0	BDL	0.34J
21-Mar-02	OT-128 Blue Hill	<1.0	<1.0	<1.0	<1.0	BDL	0.5J
21-Mar-02	OT-128 Blue Hill	<1.0	<1.0	<1.0	<1.0	BDL	0.50
18-Apr-02	OT-128 Blue Hill	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
13-May-02	OT-128 Blue Hill	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
17-Jun-02	OT-128 Blue Hill	**0.91J**	0.21J	<1.0	<1.0	BDL	0.48J
01-Jul-02	OT-128 Blue Hill	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Jul-02	OT-128 BLUE HILL	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
19-Aug-02	OT-128 BLUE HILL	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Sep-02	OT-128 BLUE HILL	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
17-Oct-02	OT-128 BLUE HILL	<1.0	<1.0	<1.0	<1.0	BDL	4.7
01-Nov-02	OT-128 BLUE HILL	<1.0	<1.0	<1.0	<1.0	BDL	0.75J
18-Dec-02	OT-128 BLUE HILL	<0.50	<0.50	<0.50	<0.50	BDL	**29.2**
10-Jan-03	OT-128 BLUE HILL	<0.50	<.50	<0.50	<0.50	BDL	**12.3**
NYSDEC Standards[d]		**0.7**	**5**	**5**	**5**	NA	**10**

Notes:

All constituent concentrations are presented in micrograms per liter (ug/L).

[a] - Sum of m, p-Xylenes and o-Xylenes.

[b] - Sum of Benzene, Toluene, Ethylbenzene, and Total Xylenes.

[c] - Methyl Tertiary Butyl Ether

[d] - NYSDEC Standards - NYSDEC Ambient Water Quality Standards and/or Guidance Values

J - Indicates an estimated value

BDL - Below detection limit

DW - Drinking Water

NA - Not applicable

Bold - Indicates value exceeds NYSDEC Ambient Water Quality Standards and/or Guidance Values.

TABLE 4
Summary of Water Quality - Service Station

Service Station
Route 52 Blue Hill Road
East Fishkill, New York

Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes[a]	BTEX[b]	MTBE[c]
11-Jun-96	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	ND
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
8-Jul-96	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	ND
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
18-Jul-96	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	ND
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
20-Aug-96	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	1
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
16-Sep-96	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	ND
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
5-Dec-96	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	5
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	2
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
22-Jan-97	Shell Service Station "A" - Influent	ND	1	ND	ND	1	5
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	4
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	3
6-Mar-97	Shell Service Station "A" - Influent	ND	0.55	ND	ND	0.55	2
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	0.76
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	0.58
9-Apr-97	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	7
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	7
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	3
29-May-97	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	ND
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
25-Jun-97	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	ND
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
22-Jul-97	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	ND
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
27-Aug-97	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	ND
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
25-Sep-97	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	ND
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
30-Oct-97	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	ND
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
29-Dec-97	Shell Service Station "A" - Influent	2	1	ND	ND	3	20
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	0.76
29-Jan-98	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	ND
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
10-Feb-98	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	1
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	2
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	0.81
10-Mar-98	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	1
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	2
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	0.81
29-May-98	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	ND
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
29-Jun-98	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	ND
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
11-Aug-98	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	2
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	4
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	5
10-Sep-98	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	ND
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
23-Nov-98	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	ND
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	1
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND

TABLE 4
Summary of Water Quality - Service Station

Service Station
Route 52 Blue Hill Road
East Fishkill, New York

Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes[a]	BTEX[b]	MTBE[c]
23-Dec-98	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	ND
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
26-Jan-99	Shell Service Station "A" - Influent	115	337	6	152	610	3,360
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	43
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
17-Feb-99	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	110
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	800
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
31-Mar-99	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	9
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
26-Apr-99	Shell Service Station "A" - Influent	ND	1	ND	ND	1	141
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
29-Jun-99	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	ND
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	5
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	ND
27-Sep-99	Shell Service Station "A" - Influent	ND	ND	ND	ND	ND	90
	Shell Service Station "B" - Inbetween	ND	ND	ND	ND	ND	34
	Shell Service Station "C" - Effluent	ND	ND	ND	ND	ND	3
20-Oct-99	Shell Service Station "A" - Influent	0.80	2	0.27	1	4	30
	Shell Service Station "B" - Inbetween	0.79	2	ND	1	4	35
	Shell Service Station "C" - Effluent	0.69	2	0.23	1	4	30
15-Nov-99	Shell Service Station "A" - Influent	0.58	2.3	0.23	1.7	5	27.4
	Shell Service Station "B" - Inbetween	0.58	2.4	0.24	1.8	5	26.5
	Shell Service Station "C" - Effluent	0.47	2	0.21	1.2	4	13
29-Nov-99	S/S INF "A"	<0.13	0.32	<0.16	<0.29	0.32	7.4
	S/S INB "B"	<0.13	0.36	<0.16	<0.29	0.36	3.6
	S/S EFF "C"	<0.13	0.32	<0.16	<0.29	0.32	3.6
27-Dec-99	S/S INF "A"	<0.13	<0.18	<0.16	<0.29	BDL	0.70
	S/S INB "B"	<0.13	<0.18	<0.16	<0.29	BDL	<0.12
	S/S EFF "C"	NA	NA	NA	NA	NA	NA
28-Nov-00	S/S INF "A"	<1.0	0.72J	<1.0	<1.0	0.72	14.9
	S/S INB "B"	<1.0	<1.0	<1.0	<1.0	BDL	3.7
	S/S EFF "C"	<1.0	<1.0	<1.0	<1.0	BDL	3.2
02-Feb-01	Route 52 & Blue Hill - Influent	<1	0.64J	<1	0.62J	BDL	4.5
	Route 52 & Blue Hill - Midfluent	<1	0.71J	<1	0.72J	BDL	4.6
	Route 52 & Blue Hill - Effluent	<1	0.49J	<1	0.51J	BDL	1.4
21-Feb-01	Route 52 & Blue Hill - INF	<1.0	<1.0	<1.0	<1.0	BDL	1.5
	Route 52 & Blue Hill - MID	<1.0	<1.0	<1.0	<1.0	BDL	0.82J
	Route 52 & Blue Hill - EFF	<1.0	<1.0	<1.0	<1.0	BDL	0.38J
15-Mar-01	Route 52 & Blue Hill - Influent	<1.0	1.4	<1.0	0.86J	2	7.8
	Route 52 & Blue Hill - Midfluent	<1.0	0.39J	<1.0	<1.0	BDL	1.8
	Route 52 & Blue Hill - Effluent	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
10-Apr-01	Kennedy Influent	ND	ND	ND	ND	BDL	0.79J
	Kennedy Midfluent	ND	ND	ND	ND	BDL	ND
	Kennedy Effluent	ND	ND	ND	ND	BDL	ND
31-May-01	Rt 52 + Blue Hill - INF	ND	ND	ND	ND	BDL	ND
	Rt 52 + Blue Hill - MID	ND	ND	ND	ND	BDL	ND
	Rt 52 + Blue Hill - EFF	ND	ND	ND	ND	BDL	ND
21-Jun-01	RT 52 & Blue Hill Rd - INF	ND	ND	ND	ND	BDL	ND
	RT 52 & Blue Hill Rd - MID	ND	ND	ND	ND	BDL	ND
	RT 52 & Blue Hill Rd - EFF	ND	ND	ND	ND	BDL	ND
30-Jul-01	RT 52 & Blue Hill Rd - INF	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	RT 52 & Blue Hill Rd - MID	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	RT 52 & Blue Hill Rd - EFF	<1.0	<1.0	<1.0	<1.0	BDL	0.29J
31-Aug-01	RT 52 & Blue Hill Rd - INF	<1.0	<1.0	<1.0	<1.0	BDL	0.56J
	RT 52 & Blue Hill Rd - MID	<1.0	<1.0	<1.0	<1.0	BDL	0.35J
	RT 52 & Blue Hill Rd - EFF	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
27-Sep-01	I Mobil	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	M Mobil	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	E Mobil	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
23-Oct-01	RT 52 & Blue Hill Rd - INF	<1.0	<1.0	<1.0	<1.0	BDL	0.63J
	RT 52 & Blue Hill Rd - MID	<1.0	<1.0	<1.0	<1.0	BDL	0.71J
	RT 52 & Blue Hill Rd - EFF	<1.0	<1.0	<1.0	<1.0	BDL	0.42J

TABLE 4
Summary of Water Quality - Service Station

Service Station
Route 52 Blue Hill Road
East Fishkill, New York

Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes[a]	BTEX[b]	MTBE[c]
20-Nov-01	I Station	<1.0	<1.0	<1.0	<1.0	BDL	0.48J
	M Station	<1.0	<1.0	<1.0	<1.0	BDL	0.37J
	E Station	<1.0	<1.0	<1.0	<1.0	BDL	0.26J
18-Dec-01	I Station	<1.0	0.27J	<1.0	<1.0	BDL	2.5
	M Station	<1.0	0.49J	<1.0	<1.0	BDL	3.6
	E Station	<1.0	0.82J	<1.0	1.2	2	1.8
16-Jan-02	I Station	<1.0	0.27J	<1.0	<1.0	BDL	2.2
	M Station	<1.0	<1.0	<1.0	<1.0	BDL	1.8
	E Station	<1.0	<1.0	<1.0	<1.0	BDL	1.4
23-Jan-02*	I Station	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	M Station	<1.0	<1.0	<1.0	<1.0	BDL	0.76J
	E Station	<1.0	<1.0	<1.0	<1.0	BDL	1.4
15-Feb-02	INF-Station	<1.0	<1.0	<1.0	<1.0	BDL	0.77J
	MID-Station	<1.0	<1.0	<1.0	<1.0	BDL	0.29J
	EFF-Station	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
21-Mar-02	INF-Station	<1.0	0.6J	<1.0	0.45J	BDL	3.6
	MID-Station	<1.0	0.35J	<1.0	<1.0	BDL	1.5
	EFF-Station	<1.0	0.42J	<1.0	<1.0	BDL	1.4
18-Apr-02	INF-Station	<1.0	<1.0	<1.0	<1.0	BDL	1.4
	MID-Station	<1.0	<1.0	<1.0	<1.0	BDL	0.38J
	EFF-Station	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
26-Apr-02*	INF-Station	<1.0	<1.0	<1.0	<1.0	BDL	1.7
	MID-Station	<1.0	<1.0	<1.0	<1.0	BDL	0.89J
	EFF-Station	<1.0	<1.0	<1.0	<1.0	BDL	1
13-May-02	INF-Station	<1.0	<1.0	<1.0	<1.0	BDL	0.76J
	MID-Station	<1.0	<1.0	<1.0	<1.0	BDL	0.85J
	EFF-Station	<1.0	<1.0	<1.0	<1.0	BDL	1.1
17-Jun-02	INF-Station	<1.0	<1.0	<1.0	<1.0	BDL	1.0
	MID-Station	<1.0	<1.0	<1.0	<1.0	BDL	0.63J
	EFF-Station	<1.0	<1.0	<1.0	<1.0	BDL	1.1
18-Jul-02	INF-Station	<1.0	<1.0	<1.0	<1.0	BDL	0.28J
	MID-Station	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-Station	<1.0	<1.0	<1.0	<1.0	BDL	0.51J
19-Aug-02	INF-STATION	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	MID-STATION	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-STATION	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Sep-02	INF-STATION	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	MID-STATION	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-STATION	<1.0	<1.0	<1.0	<1.0	BDL	0.51J
17-Oct-02	INF-STATION	<1.0	0.25J	<1.0	<1.0	BDL	1.6
	MID-STATION	<1.0	0.15J	<1.0	<1.0	BDL	1.0
	EFF-STATION	<1.0	0.17J	<1.0	<1.0	BDL	0.74J
19-Nov-02	INF-STATION	<1.0	0.22J	<1.0	<1.0	BDL	1.9
	MID-STATION	<1.0	0.29J	<1.0	0.12J	BDL	1.8
	EFF-STATION	<1.0	0.49J	<1.0	0.30J	BDL	2.3
NYSDEC Standards[d]		**0.7**	**5**	**5**	**5**	**NA**	**10**

Notes:

All constituent concentrations are presented in micrograms per liter (ug/L).

[a] - Sum of m, p-Xylenes and o-Xylenes.

[b] - Sum of Benzene, Toluene, Ethylbenzene, and Total Xylenes.

[c] - Methyl Tertiary Butyl Ether

[d] - NYSDEC Standards - NYSDEC Ambient Water Quality Standards and Guidance Values

* - Sample taken after carbon vessel changeout

BDL - Below detection limit

DW - Drinking Water

NA - Not applicable

ND - Not detected above lab detection limits

J - Indicates an estimated value

Bold - Indicates value exceeds NYSDEC Ambient Water Quality Standards and Guidance Values.

TABLE 5
Summary of Water Quality - 2421 Route 52

2421 Route 52
(Formerly 1885 Route 52 and Vacant House)
East Fishkill, New York

Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes[a]	BTEX[b]	MTBE[c]
11-Aug-98	1885 Route 52 "A" - Influent	ND	ND	ND	ND	ND	32
	1885 Route 52 "B" - Midfluent	ND	ND	ND	ND	ND	ND
	1885 Route 52 "C" - Effluent	ND	ND	ND	ND	ND	ND
29-Sep-98	1885 Route 52 "A" - Influent	ND	ND	ND	ND	ND	15
	1885 Route 52 "B" - Midfluent	ND	ND	ND	ND	ND	ND
	1885 Route 52 "C" - Effluent	ND	ND	ND	ND	ND	ND
22-Oct-98	1885 Route 52 "A" - Influent	ND	ND	ND	ND	ND	25
	1885 Route 52 "B" - Midfluent	ND	ND	ND	ND	ND	ND
	1885 Route 52 "C" - Effluent	ND	ND	ND	ND	ND	ND
23-Nov-98	1885 Route 52 "A" - Influent	ND	ND	ND	ND	ND	17
	1885 Route 52 "B" - Midfluent	ND	ND	ND	ND	ND	ND
	1885 Route 52 "C" - Effluent	ND	ND	ND	ND	ND	ND
29-Jun-99	1885 Route 52 "A" - Influent	ND	ND	ND	ND	ND	43
	1885 Route 52 "B" - Midfluent	ND	ND	ND	ND	ND	ND
	1885 Route 52 "C" - Effluent	ND	ND	ND	ND	ND	ND
2-Feb-01	1885 Route 52 - Influent	<1.0	<1.0	<1.0	<1.0	BDL	158
	1885 Route 52 - Midfluent	<1.0	<1.0	<1.0	<1.0	BDL	0.31J
	1885 Route 52 - Effluent	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
21-Feb-01	1885 Route 52 - INF	<1.0	<1.0	<1.0	<1.0	BDL	174
	1885 Route 52 - MID	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	1885 Route 52 - EFF	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
15-Mar-01	1885 Route 52 - Influent	<1.0	<1.0	<1.0	<1.0	BDL	176
	1885 Route 52 - Midfluent	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	1885 Route 52 - Effluent	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
10-Apr-01	Vacant House Influent	ND	ND	ND	ND	BDL	132
	Vacant House Midfluent	ND	ND	ND	ND	BDL	ND
	Vacant House Effluent	ND	ND	ND	ND	BDL	ND
30-Jan-02	INF-2421 Route 52	ND	ND	ND	ND	BDL	152
	MID-2421 Route 52	ND	ND	ND	ND	BDL	ND
	EFF-2421 Route 52	ND	ND	ND	ND	BDL	0.37J
15-Feb-02	INF-2421 Route 52	ND	ND	ND	ND	BDL	164
	MID-2421 Route 52	ND	ND	ND	ND	BDL	ND
	EFF-2421 Route 52	ND	ND	ND	ND	BDL	ND
21-Mar-02	INF-2421 Route 52	ND	ND	ND	ND	BDL	182
	MID-2421 Route 52	ND	ND	ND	ND	BDL	ND
	EFF-2421 Route 52	ND	ND	ND	ND	BDL	ND
	TAP-2421 Route 52	ND	ND	ND	ND	BDL	144
18-Apr-02	INF-2421 Route 52	<1.0	<1.0	<1.0	<1.0	BDL	192
	MID-2421 Route 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-2421 Route 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	TAP-2421 Route 52	<1.0	<1.0	<1.0	<1.0	BDL	0.49J
13-May-02	INF-2421 Route 52	<1.0	<1.0	<1.0	<1.0	BDL	186
	MID-2421 Route 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-2421 Route 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	TAP-2421 Route 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
17-Jun-02	INF-2421 Route 52	<1.0	<1.0	<1.0	<1.0	BDL	161
	MID-2421 Route 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-2421 Route 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Jul-02	INF-2421 RT 52	<1.0	0.22J	<1.0	<1.0	BDL	135
	MID-2421 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	1.0
	EFF-2421 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
19-Aug-02	INF-2421 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	112
	MID-2421 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	74.1
	EFF-2421 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	7.6
18-Sept-02*	INF-2421 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	164
	MID-2421 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	0.34J
	EFF-2421 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
17-Oct-02	INF-2421 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	147
	MID-2421 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-2421 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
19-Nov-02	INF-2421 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	225
	MID-2421 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-2421 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0

TABLE 5
Summary of Water Quality - 2421 Route 52

2421 Route 52
(Formerly 1885 Route 52 and Vacant House)
East Fishkill, New York

Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes[a]	BTEX[b]	MTBE[c]
18-Dec-02	INF-2421 RT 52	<5.0	<5.0	<5.0	<5.0	BDL	**235**
	MID-2421 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-2421 RT 52	<0.50	<0.50	<0.50	<0.50	BDL	<0.50
NYSDEC Standards[d]		**0.7**	**5**	**5**	**5**	NA	**10**

Notes:

All constituent concentrations are presented in micrograms per liter (ug/L).

[a] - Sum of m, p-Xylenes and o-Xylenes.

[b] - Sum of Benzene, Toluene, Ethylbenzene, and Total Xylenes.

[c] - Methyl Tertiary Butyl Ether

[d] - NYSDEC Standards - NYSDEC Ambient Water Quality Standards and/or Guidance Values

J - Indicates an estimated value

* - Sample taken after carbon vessel cahngeouts

DW - Drinking Water

BDL - Below detection limit

NA - Not applicable

ND - Not detected above lab detection limits

Bold - Indicates value exceeds NYSDEC Ambient Water Quality Standards and/or Guidance Values.

TABLE 6
Summary of Water Quality - 2424 Route 52

2424 Route 52
East Fishkill, New York

Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes[a]	BTEX[b]	MTBE[c]
20-Nov-01	IT 2424 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	**97.3**
18-Dec-01	IT 2424 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
16-Jan-02	IT 2424 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
15-Feb-02	IT 2424 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
21-Mar-02	IT 2424 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Apr-02	IT 2424 RT 53	<1.0	<1.0	<1.0	<1.0	BDL	<1.1
13-May-02	IT 2424 RT 53	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
17-Jun-02	TAP - 2424 RT. 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Jul-02	TAP - 2424 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
19-Aug-02	IT - 2424 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Sep-02	IT - 2424 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
17-Oct-02	IT - 2424 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
19-Nov-02	TAP - 2424 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Dec-02	TAP - 2424 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
NYSDEC Standards[d]		**0.7**	**5**	**5**	**5**	NA	**10**

Notes:

All constituent concentrations are presented in micrograms per liter (ug/L).

[a] - Sum of m, p-Xylenes and o-Xylenes.

[b] - Sum of Benzene, Toluene, Ethylbenzene, and Total Xylenes.

[c] - Methyl Tertiary Butyl Ether

[d] - NYSDEC Standards - NYSDEC Ambient Water Quality Standards and/or Guidance Values

BDL - Below detection limit

DW - Drinking Water

NA - Not applicable

Bold - Indicates value exceeds NYSDEC Ambient Water Quality Standards and/or Guidance Values.

TABLE 7
Summary of Water Quality - 2427 Route 52

2427 Route 52
(Formerly 1891 Route 52)
East Fishkill, New York

Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes[a]	BTEX[b]	MTBE[c]
11-Jun-96	Beal Property - Tap	ND	ND	ND	ND	ND	ND
8-Jul-96	Beal Property "A" - Influent	ND	ND	ND	ND	ND	37
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
20-Aug-96	Beal Property "A" - Influent	ND	ND	ND	ND	ND	27
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
16-Sep-96	Beal Property "A" - Influent	ND	ND	ND	ND	ND	ND
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
5-Dec-96	Beal Property "A" - Influent	ND	ND	ND	ND	ND	44
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
22-Jan-97	Beal Property "A" - Influent	ND	ND	ND	ND	ND	55
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
6-Mar-97	Beal Property "A" - Influent	ND	ND	ND	ND	ND	51
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	0.49
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
9-Apr-97	Beal Property "A" - Influent	ND	ND	ND	ND	ND	83
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	5
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
29-May-97	Beal Property "A" - Influent	ND	ND	ND	ND	ND	69
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
25-Jun-97	Beal Property "A" - Influent	ND	ND	ND	ND	ND	51
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
22-Jul-97	Beal Property "A" - Influent	ND	ND	ND	ND	ND	37
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
27-Aug-97	Beal Property "A" - Influent	ND	ND	ND	ND	ND	41
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	3
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
25-Sep-97	Beal Property "A" - Influent	ND	ND	ND	ND	ND	30
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
30-Oct-97	Beal Property "A" - Influent	ND	ND	ND	ND	ND	27
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
5-Dec-97	Beal Property "A" - Influent	ND	ND	ND	ND	ND	23
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
29-Dec-97	Beal Property "A" - Influent	ND	ND	ND	ND	ND	31
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	0.82
29-Jan-98	Beal Property "A" - Influent	ND	ND	ND	ND	ND	30
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
10-Feb-98	Beal Property "A" - Influent	ND	ND	ND	ND	ND	38
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
10-Mar-98	Beal Property "A" - Influent	ND	ND	ND	ND	ND	28
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
29-Apr-98	Beal Property "A" - Influent	ND	ND	ND	ND	ND	41
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
29-May-98	Beal Property "A" - Influent	ND	ND	ND	ND	ND	35
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND

TABLE 7
Summary of Water Quality - 2427 Route 52

2427 Route 52
(Formerly 1891 Route 52)
East Fishkill, New York

Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes[a]	BTEX[b]	MTBE[c]
29-Jun-98	Beal Property "A" - Influent	ND	ND	ND	ND	ND	**36**
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	**5**
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
11-Aug-98	Beal Property "A" - Influent	ND	ND	ND	ND	ND	**37**
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
10-Sep-98	Beal Property "A" - Influent	ND	ND	ND	ND	ND	**33**
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
22-Oct-98	Beal Property "A" - Influent	ND	ND	ND	ND	ND	**30**
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
23-Nov-98	Beal Property "A" - Influent	ND	ND	ND	ND	ND	**28**
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
23-Dec-98	Beal Property "A" - Influent	ND	ND	ND	ND	ND	**53**
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	**5**
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
26-Jan-99	Beal Property "A" - Influent	ND	ND	ND	ND	ND	**37**
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
31-Mar-99	Beal Property "A" - Influent	ND	ND	ND	ND	ND	**36**
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
26-Apr-99	Beal Property "A" - Influent	ND	ND	ND	ND	ND	**43**
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
29-Jun-99	Beal Property "A" - Influent	ND	ND	ND	ND	ND	**49**
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	**13**
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	**6**
20-Oct-99	Beal Property "A" - Influent	ND	ND	ND	ND	ND	**31**
	Beal Property "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Beal Property "C" - Effluent	ND	ND	ND	ND	ND	ND
15-Nov-99	Beal Property "A" - Influent	<0.13	<0.18	<0.16	<0.29	BDL	**42.8**
	Beal Property "B" - Inbetween	<0.13	<0.18	<0.16	<0.29	BDL	**<0.12**
	Beal Property "C" - Effluent	<0.13	ND	<0.16	<0.29	BDL	**<0.12**
27-Dec-99	BEAL INF "A"	<0.13	<0.18	<0.16	<0.29	BDL	**43.2**
	BEAL INB "B"	<0.13	<0.18	<0.16	<0.29	BDL	**5.6**
	BEAL EFF "C"	<0.13	<1.8	<0.16	<0.29	BDL	**<0.12**
31-Jul-00	BEAL INF "A"	<1.0	<1.0	<1.0	<1.0	BDL	**161**
	BEAL INB "B"	<1.0	<1.0	<1.0	<1.0	BDL	**5.9**
	BEAL EFF "C"	<1.0	<1.0	<1.0	<1.0	BDL	**<1.0**
22-Aug-00	BEAL INF "A"	<1.0	<1.0	<1.0	<1.0	BDL	**100**
	BEAL INB "B"	<1.0	<1.0	<1.0	<1.0	BDL	**10.9**
	BEAL EFF "C"	<1.0	<1.0	<1.0	<1.0	BDL	**<1.0**
25-Sep-00	BEAL INF "A"	<1.0	<1.0	<1.0	<1.0	BDL	**169**
	BEAL INB "B"	<1.0	<1.0	<1.0	<1.0	BDL	**37.7**
	BEAL EFF "C"	<1.0	<1.0	<1.0	<1.0	BDL	**<1.0**
28-Nov-00	BEAL INF "A"	<1.0	<1.0	<1.0	<1.0	BDL	**130**
	BEAL INB "B"	<1.0	<1.0	<1.0	<1.0	BDL	**<1.0**
	BEAL EFF "C"	<1.0	<1.0	<1.0	<1.0	BDL	**<1.0**
2-Feb-01	1891 Route 52 - Influent	<1.0	<1.0	<1.0	<1.0	BDL	**90.3**
	1891 Route 52 - Midfluent	<1.0	<1.0	<1.0	<1.0	BDL	**5.2**
	1891 Route 52 - Effluent	<1.0	<1.0	<1.0	<1.0	BDL	**<1**
21-Feb-01	1891 Route 52 - Influent	<1.0	<1.0	<1.0	<1.0	BDL	**118**
	1891 Route 52 - Midfluent	<1.0	<1.0	<1.0	<1.0	BDL	**19.8**
	1891 Route 52 - Effluent	<1.0	<1.0	<1.0	<1.0	BDL	**<1.0**
15-Mar-01	1891 Route 52 - Influent	<1.0	<1.0	<1.0	<1.0	BDL	**110**
	1891 Route 52 - Midfluent	<1.0	<1.0	<1.0	<1.0	BDL	**<1.0**
	1891 Route 52 - Effluent	<1.0	<1.0	<1.0	<1.0	BDL	**<1.0**

TABLE 7
Summary of Water Quality - 2427 Route 52

2427 Route 52
(Formerly 1891 Route 52)
East Fishkill, New York

Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes[a]	BTEX[b]	MTBE[c]
10-Apr-01	Schnieder Influent	ND	ND	ND	ND	BDL	82.5
	Schnieder Midfluent	ND	ND	ND	ND	BDL	ND
	Schnieder Effluent	ND	ND	ND	ND	BDL	ND
31-May-01	1891 Rt 52 - INF	ND	ND	ND	ND	BDL	274
	1891 Rt 52 - MID	ND	ND	ND	ND	BDL	6.6
	1891 Rt 52 - EFF	ND	ND	ND	ND	BDL	ND
21-Jun-01	Taconic - INF	ND	ND	ND	ND	BDL	263
	Taconic - MID	ND	ND	ND	ND	BDL	69.2
	Taconic - EFF	ND	ND	ND	ND	BDL	ND
30-Jul-01	1891 Rt 52 - INF	<1.0	<1.0	<1.0	<1.0	BDL	245
	1891 Rt 52 - MID	<1.0	<1.0	<1.0	<1.0	BDL	207
	1891 Rt 52 - EFF	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
31-Aug-01	2427 Rt 52 - INF	<1.0	<1.0	<1.0	<1.0	BDL	223
	2427 Rt 52 - MID	<1.0	0.50	<1.0	<1.0	1	242
	2427 Rt 52 - EFF	<1.0	0.32	<1.0	<1.0	BDL	1.5
27-Sep-01	2427 Rt 52 - INF	<1.0	<1.0	<1.0	<1.0	BDL	127
	2427 Rt 52 - MID	<1.0	<1.0	<1.0	<1.0	BDL	226
	2427 Rt 52 - EFF	<1.0	<1.0	<1.0	<1.0	BDL	11.9
23-Oct-01	2427 Rt 52 - INF	<1.0	<1.0	<1.0	<1.0	BDL	165
	2427 Rt 52 - MID	<1.0	<1.0	<1.0	<1.0	BDL	1.1
	2427 Rt 52 - EFF	<1.0	<1.0	<1.0	<1.0	BDL	0.48
20-Nov-01	2427 Rt 52 - INF	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	2427 Rt 52 - MID	<1.0	<1.0	<1.0	<1.0	BDL	2.9
	2427 Rt 52 - EFF	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Dec-01	INF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	136
	MID-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	6.2
	EFF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
30-Jan-02	INF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	150
	MID-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	52.6
	EFF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
19-Feb-02	INF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	241
	MID-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	102
	EFF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
21-Mar-02	INF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	293
	MID-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	170
	EFF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Apr-02*	INF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	297
	MID-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
13-May-02	INF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	435
	MID-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
17-Jun-02	INF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	208
	MID-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
23-Jul-02	INF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	365
	MID-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	8.1
	EFF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
19-Aug-02	Could not sample						
18-Sep-02	INF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	515
	MID-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	53.5
	EFF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
17-Oct-02*	INF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	384
	MID-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
19-Nov-02	INF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	481
	MID-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-2427 RT 52	<1.0	<1.0	<1.0	<1.0	BDL	<1.0

TABLE 7
Summary of Water Quality - 2427 Route 52

2427 Route 52
(Formerly 1891 Route 52)
East Fishkill, New York

Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes[a]	BTEX[b]	MTBE[c]
18-Dec-02	INF-2427 RT 52	<10	<10	<10	<10	BDL	**347**
	MID-2427 RT 52	<0.50	<0.50	<0.50	<0.50	BDL	0.25J
	EFF-2427 RT 52	<0.50	<0.50	<0.50	<0.50	BDL	<1.0
NYSDEC Standards[d]		**0.7**	**5**	**5**	**5**	NA	**10**

Notes:

All constituent concentrations are presented in micrograms per liter (ug/L).

[a] - Sum of m, p-Xylenes and o-Xylenes.

[b] - Sum of Benzene, Toluene, Ethylbenzene, and Total Xylenes.

[c] - Methyl Tertiary Butyl Ether

[d] - NYSDEC Standards - NYSDEC Ambient Water Quality Standards and/or Guidance Values

* - Sample taken after carbon vessel changeout

J - Indicates an estimated value

BDL - Below detection limit

DW - Drinking Water

NA - Not applicable

Bold - Indicates value exceeds NYSDEC Ambient Water Quality Standards and/or Guidance Values.

TABLE 8
Summary of Water Quality - 110 Old State Road

110 Old State Road
East Fishkill, New York

Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes[a]	BTEX[b]	MTBE[c]
22-Oct-98	HICKMAN TAP	ND	ND	ND	ND	ND	ND
31-Aug-01	110 Old State Rd - Tap	<1.0	<1.0	<1.0	<1.0	BDL	0.53J
	110 Old State Rd - System	<1.0	<1.0	<1.0	<1.0	BDL	0.84J
27-Sep-01	E 110 Old State Rd - Outside Tap	<1.0	<1.0	<1.0	<1.0	BDL	0.44J
	I 110 Old State Rd - Inside Tap	<1.0	0.30	<1.0	<1.0	BDL	0.6J
24-Oct-01	E 110 Old State Rd - Outside Tap	<1.0	<1.0	<1.0	<1.0	BDL	0.5J
	I 110 Old State Rd - Inside Tap	<1.0	0.30	<1.0	<1.0	BDL	<1.0
20-Nov-01	OT 110 Old State Rd - Outside Tap	<1.0	<1.0	<1.0	<1.0	BDL	0.53J
	IT 110 Old State Rd - Inside Tap	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Dec-01	OT 110 Old State Rd - Outside Tap	<1.0	<1.0	<1.0	<1.0	BDL	0.57J
	IT 110 Old State Rd - Inside Tap	<1.0	<1.0	<1.0	<1.0	BDL	0.52J
16-Jan-02	OT 110 Old State Rd - Outside Tap	<1.0	<1.0	<1.0	<1.0	BDL	0.53J
	IT 110 Old State Rd - Inside Tap	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
15-Feb-02	OT 110 Old State Rd - Outside Tap	<1.0	<1.0	<1.0	<1.0	BDL	0.49J
21-Mar-02	OT 110 Old State Rd - Outside Tap	<1.0	<1.0	<1.0	<1.0	BDL	0.58J
18-Apr-02	OT 110 Old State Rd - Outside Tap	<1.0	<1.0	<1.0	<1.0	BDL	0.59J
14-May-02	OT 110 Old State Rd - INF System	<1.0	<1.0	<1.0	<1.0	BDL	0.51J
17-Jun-02	INF 110 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Jul-02	OT-110 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	0.45J
19-Aug-02	INF-110 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	0.36J
18-Sep-02	INF-110 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	0.89J
17-Oct-02	INF-110 OLD STATE	<1.0	0.17J	<1.0	0.099J	BDL	0.49J
19-Nov-02	OT-110 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	0.42J
18-Dec-02	OT-110 OLD STATE	<0.50	<0.50	<0.50	<0.50	BDL	0.46J
NYSDEC Standards[d]		**0.7**	**5**	**5**	**5**	NA	**10**

Notes:

All constituent concentrations are presented in micrograms per liter (ug/L).

[a] - Sum of m, p-Xylenes and o-Xylenes.

[b] - Sum of Benzene, Toluene, Ethylbenzene, and Total Xylenes.

[c] - Methyl Tertiary Butyl Ether

[d] - NYSDEC Standards - NYSDEC Ambient Water Quality Standards and/or Guidance Values

BDL - Below detection limit

DW - Drinking Water

NA - Not applicable

J - Indicates an estimated value

Bold - Indicates value exceeds NYSDEC Ambient Water Quality Standards and/or Guidance Values.

TABLE 9
Summary of Water Quality - 116 Old State Road

116 Old State Road
East Fishkill, New York

Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes[a]	BTEX[b]	MTBE[c]
18-Jul-96	Bittenbender - Tap	ND	ND	ND	ND	ND	7
20-Aug-96	Bittenbender "A" - Influent	ND	ND	ND	ND	ND	6
	Bittenbender "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Bittenbender "C" - Effluent	ND	ND	ND	ND	ND	ND
16-Sep-96	Bittenbender - Tap	ND	ND	ND	ND	ND	ND
	Bittenbender "A" - Influent	ND	ND	ND	ND	ND	6
	Bittenbender "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Bittenbender "C" - Effluent	ND	ND	ND	ND	ND	ND
5-Dec-96	Bittenbender "A" - Influent	ND	ND	ND	ND	ND	7
	Bittenbender "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Bittenbender "C" - Effluent	ND	ND	ND	ND	ND	ND
22-Jan-97	Bittenbender "A" - Influent	ND	ND	ND	ND	ND	7
	Bittenbender "B" - Inbetween	ND	ND	ND	ND	ND	2
	Bittenbender "C" - Effluent	ND	ND	ND	ND	ND	ND
6-Mar-97	Bittenbender "A" - Influent	ND	ND	ND	ND	ND	9
	Bittenbender "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Bittenbender "C" - Effluent	ND	ND	ND	ND	ND	ND
23-Apr-97	Bittenbender "A" - Influent	ND	ND	ND	ND	ND	10
	Bittenbender "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Bittenbender "C" - Effluent	ND	ND	ND	ND	ND	ND
29-May-97	Bittenbender "A" - Influent	ND	ND	ND	ND	ND	8
	Bittenbender "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Bittenbender "C" - Effluent	ND	ND	ND	ND	ND	ND
27-Aug-97	Bittenbender "A" - Influent	ND	ND	ND	ND	ND	ND
	Bittenbender "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Bittenbender "C" - Effluent	ND	ND	ND	ND	ND	8
25-Sep-97	Bittenbender "A" - Influent	ND	ND	ND	ND	ND	7
	Bittenbender "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Bittenbender "C" - Effluent	ND	ND	ND	ND	ND	ND
30-Oct-97	Bittenbender "A" - Influent	ND	ND	ND	ND	ND	7
	Bittenbender "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Bittenbender "C" - Effluent	ND	ND	ND	ND	ND	ND
5-Dec-97	Bittenbender "A" - Influent	ND	ND	ND	ND	ND	8
	Bittenbender "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Bittenbender "C" - Effluent	ND	ND	ND	ND	ND	ND
29-Dec-97	Bittenbender "A" - Influent	NA	NA	NA	NA	ND	NA
	Bittenbender "B" - Inbetween	NA	NA	NA	NA	ND	NA
	Bittenbender "C" - Effluent	NA	NA	NA	NA	ND	NA
10-Feb-98	Bittenbender "A" - Influent	ND	ND	ND	ND	ND	8
	Bittenbender "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Bittenbender "C" - Effluent	ND	ND	ND	ND	ND	ND
10-Mar-98	Bittenbender "A" - Influent	ND	ND	ND	ND	ND	7
	Bittenbender "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Bittenbender "C" - Effluent	ND	ND	ND	ND	ND	ND
29-May-98	Bittenbender "A" - Influent	ND	ND	ND	ND	ND	7
	Bittenbender "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Bittenbender "C" - Effluent	ND	ND	ND	ND	ND	ND
11-Aug-98	Bittenbender "A" - Influent	ND	ND	ND	ND	ND	10
	Bittenbender "B" - Inbetween	ND	ND	ND	ND	ND	1
	Bittenbender "C" - Effluent	ND	ND	ND	ND	ND	ND
10-Sep-98	Bittenbender "A" - Influent	ND	ND	ND	ND	ND	6
	Bittenbender "B" - Inbetween	ND	ND	ND	ND	ND	ND
	Bittenbender "C" - Effluent	ND	ND	ND	ND	ND	ND
23-Dec-98	Bittenbender "A" - Influent	ND	ND	ND	ND	ND	6
	Bittenbender "B" - Inbetween	ND	ND	ND	ND	ND	1
	Bittenbender "C" - Effluent	ND	ND	ND	ND	ND	ND
26-Apr-99	Talbot Influent "A"	ND	ND	ND	ND	ND	9
	Talbot Inbetween "B"	ND	ND	ND	ND	ND	2
	Talbot Effluent "C"	ND	ND	ND	ND	ND	ND
27-Sep-99	Talbot Influent "A"	ND	ND	ND	ND	ND	6
	Talbot Inbetween "B"	ND	ND	ND	ND	ND	ND
	Talbot Effluent "C"	ND	ND	ND	ND	ND	ND

TABLE 9
Summary of Water Quality - 116 Old State Road

116 Old State Road
East Fishkill, New York

Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes[a]	BTEX[b]	MTBE[c]
20-Oct-99	Talbot Influent "A"	ND	ND	ND	ND	ND	ND
	Talbot Inbetween "B"	ND	ND	ND	ND	ND	ND
	Talbot Effluent "C"	ND	ND	ND	ND	ND	ND
15-Nov-99	TALBOT INF "A"	<0.13	<0.18	<0.16	<0.29	BDL	7.5
	TALBOT INB "B"	<0.13	<0.18	<0.16	<0.29	BDL	<0.12
	TALBOT EFF "C"	<0.13	<0.18	<0.16	<0.29	BDL	<0.12
27-Dec-99	TALBOT INF "A"	<0.13	<0.18	<0.16	<0.29	BDL	7.4
	TALBOT INB "B"	<0.13	<0.18	<0.16	<0.29	BDL	<0.12
	TALBOT EFF "C"	<0.13	<0.18	<0.16	<0.29	BDL	<0.12
28-Nov-00	TALBOT INF "A"	<1.0	<1.0	<1.0	<1.0	BDL	7.4
	TALBOT INB "B"	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	TALBOT EFF "C"	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
2-Feb-01	116 Old State Road - Inf	<1.0	<1.0	<1.0	<1.0	BDL	5.6
	116 Old State Road - Mid	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	116 Old State Road - Eff	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
21-Feb-01	116 Old State Road - Inf	<1.0	<1.0	<1.0	<1.0	BDL	6.6
	116 Old State Road - Mid	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	116 Old State Road - Eff	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
15-Mar-01	116 Old State Road - Inf	<1.0	<1.0	<1.0	<1.0	BDL	<7.1
	116 Old State Road - Mid	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	116 Old State Road - Eff	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
10-Apr-01	Talbot Influent	ND	ND	ND	ND	BDL	5.8
	Talbot Midfluent	ND	ND	ND	ND	BDL	0.39
	Talbot Effluent	ND	ND	ND	ND	BDL	ND
31-May-01	116 Old State Road - INF	ND	ND	ND	ND	BDL	2.2
	116 Old State Road - MID	ND	ND	ND	ND	BDL	1710
	116 Old State Road - EFF	ND	ND	ND	ND	BDL	2.0
21-Jun-01	116 Old State Road - INF	ND	ND	ND	ND	BDL	5.9
	116 Old State Road - MID	ND	ND	ND	ND	BDL	1050
	116 Old State Road - EFF	ND	ND	ND	ND	BDL	2.4
31-Jul-01	116 Old State Road - INF	ND	ND	ND	ND	BDL	7.0
	116 Old State Road - MID	ND	ND	ND	ND	BDL	256
	116 Old State Road - EFF	ND	ND	ND	ND	BDL	672
31-Aug-01	116 Old State Road - INF	<1.0	<1.0	<1.0	<1.0	BDL	6.9
	116 Old State Road - MID	<1.0	<1.0	<1.0	<1.0	BDL	75.5
	116 Old State Road - EFF	<1.0	<1.0	<1.0	<1.0	BDL	461
10-Sep-01	116 Old State Road - INF	<1.0	<1.0	<1.0	<1.0	BDL	6.9
	116 Old State Road - MID	NS	NS	NS	NS	NS	NS
	116 Old State Road - EFF	<1.0	<1.0	<1.0	<1.0	BDL	399
27-Sep-01	116 Old State Road - INF	<1.0	<1.0	<1.0	<1.0	BDL	7.0
	116 Old State Road - MID	<1.0	<1.0	<1.0	<1.0	BDL	47.6
	116 Old State Road - EFF	<1.0	<1.0	<1.0	<1.0	BDL	314
	116 Old State Road - Sink	<1.0	<1.0	<1.0	<1.0	BDL	289
01-Oct-01	116 Old State Road - INF	<1.0	<1.0	<1.0	<1.0	BDL	7.6
	116 Old State Road - GW	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	116 Old State Road - EFF	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
23-Oct-01	116 Old State Road - INF	<1.0	<1.0	<1.0	<1.0	BDL	7.0
	116 Old State Road - MID	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	116 Old State Road - EFF	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
20-Nov-01	116 Old State Road - INF	<1.0	<1.0	<1.0	<1.0	BDL	5.6
	116 Old State Road - MID	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	116 Old State Road - EFF	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Dec-01	116 Old State Road - INF	<1.0	<1.0	<1.0	<1.0	BDL	6.8
	116 Old State Road - MID	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	116 Old State Road - EFF	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
1-Feb-02	INF-116 Old State Road	<1.0	<1.0	<1.0	<1.0	BDL	6.6
	MID-116 Old State Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-116 Old State Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
15-Feb-02	INF-116 Old State Road	<1.0	<1.0	<1.0	<1.0	BDL	6.4
	MID-116 Old State Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-116 Old State Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
21-Mar-02	INF-116 Old State Road	<1.0	<1.0	<1.0	<1.0	BDL	5.9
	MID-116 Old State Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-116 Old State Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0

TABLE 9
Summary of Water Quality - 116 Old State Road

116 Old State Road
East Fishkill, New York

Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes[a]	BTEX[b]	MTBE[c]
18-Apr-02	INF-116 Old State Road	<1.0	<1.0	<1.0	<1.0	BDL	6.1
	MID-116 Old State Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-116 Old State Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
13-May-02	INF-116 Old State Road	<1.0	<1.0	<1.0	<1.0	BDL	6.6
	MID-116 Old State Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-116 Old State Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
17-Jun-02	INF-116 Old State Road	<1.0	<1.0	<1.0	<1.0	BDL	6.6
	MID-116 Old State Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-116 Old State Road	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Jul-02	INF-116 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	4.7
	MID-116 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
	EFF-116 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
19-Aug-02	INF-116 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	3.4
	MID-116 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	0.33J
	EFF-116 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Sep-02	INF-116 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	5.6
	MID-116 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	0.56J
	EFF-116 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
17-Oct-02	INF-116 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	5.1
	MID-116 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	0.76J
	EFF-116 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
19-Nov-02	INF-116 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	3.1
	MID-116 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	1.0
	EFF-116 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	<1.0
18-Dec-02	INF-116 OLD STATE	<0.50	<0.50	<0.50	<0.50	BDL	4.6
	MID-116 OLD STATE	<1.0	<1.0	<1.0	<1.0	BDL	0.68J
	EFF-116 OLD STATE	<0.50	<0.50	<0.50	<0.50	BDL	<0.50
NYSDEC Standards[d]		0.7	5	5	5	NA	10

Notes:

All constituent concentrations are presented in micrograms per liter (ug/L).

[a] - Sum of m, p-Xylenes and o-Xylenes.

[b] - Sum of Benzene, Toluene, Ethylbenzene, and Total Xylenes.

[c] - Methyl Tertiary Butyl Ether

[d] - NYSDEC Standards - NYSDEC Ambient Water Quality Standards and/or Guidance Values

BDL - Below detection limit

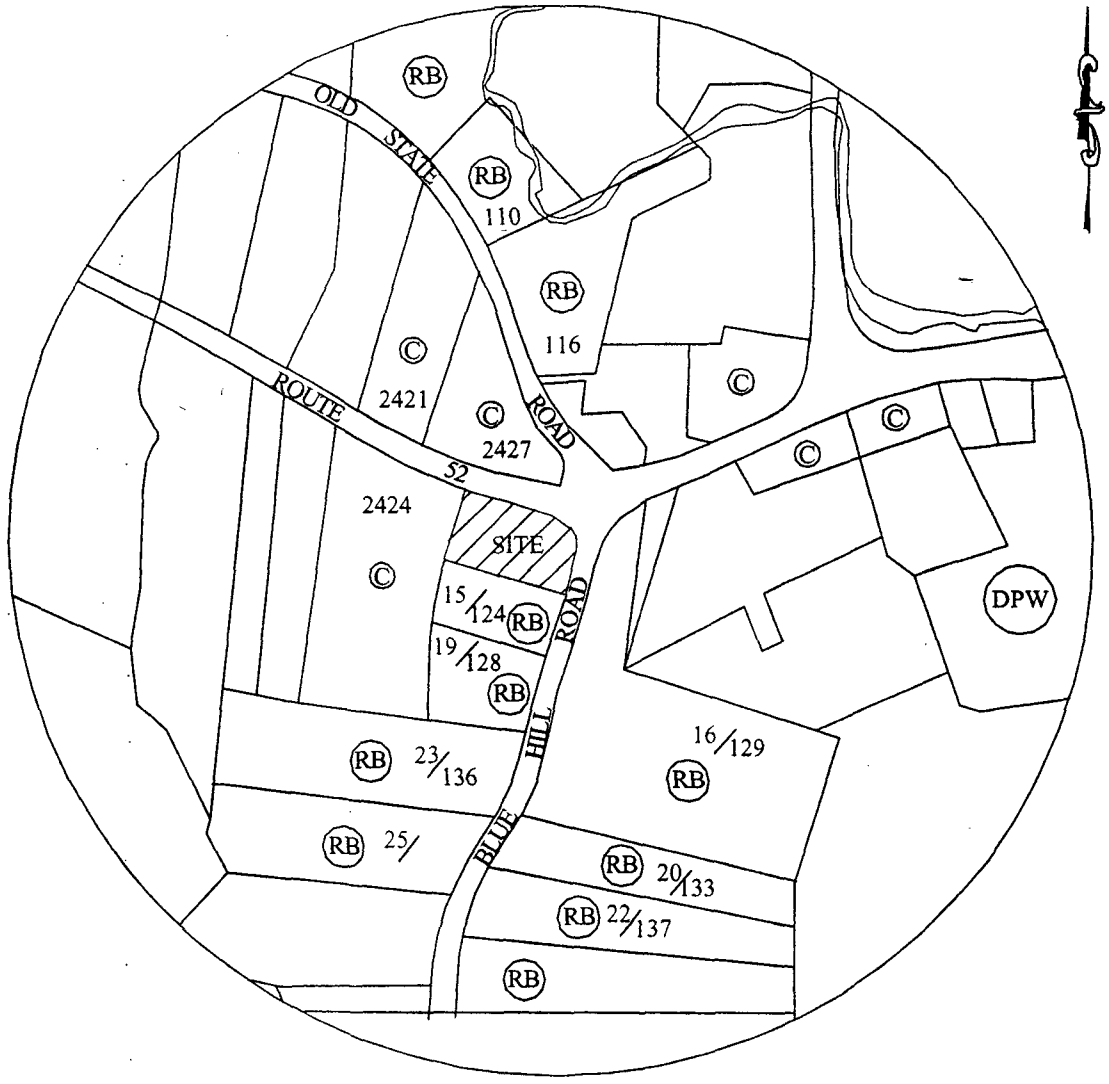
DW - Drinking Water

NA - Not applicable

J - Indicates an estimated value

Bold - Indicates value exceeds NYSDEC Ambient Water Quality Standards and/or Guidance Values.

FIGURES



LEGEND

DPW	DEPARTMENT OF PUBLIC WORKS
RB	RESIDENTIAL WITH BASEMENT
©	COMMERCIAL
16/129	ADDRESS STREET NUMBER OLD/CURRENT

LATITUDE: 41°33' 9" N
LONGITUDE: 73°47' 55" W

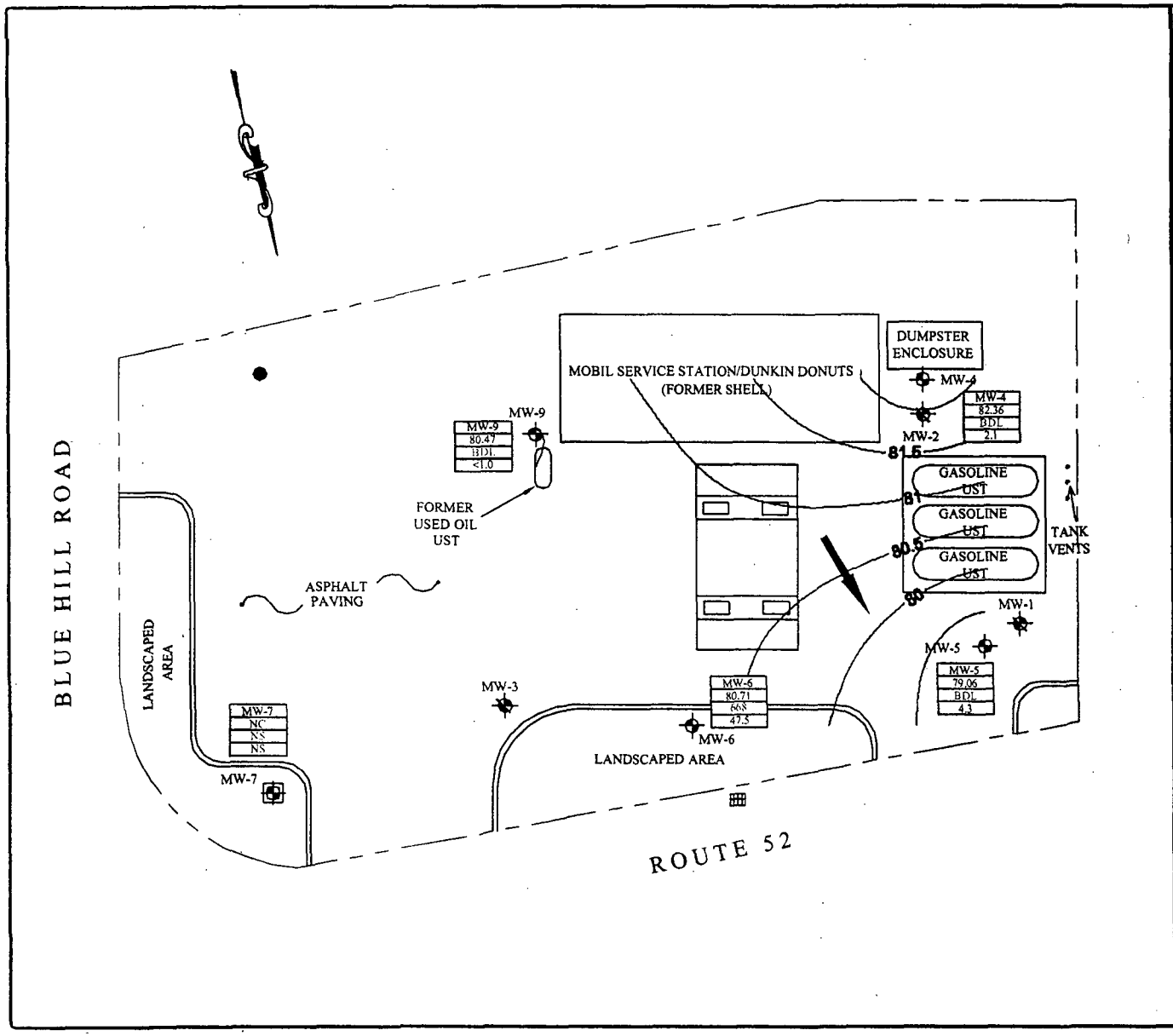
SCALE
0 400 800
1 inch = 400 feet

FIGURE 1
AREA MAP

FORMER SHELL SERVICE STATION
ROUTE 52 & BLUE HILL ROAD
EAST FISHKILL, NEW YORK

DRAWN BY:	RG	SCALE:	1" = 400'
REVISED BY:	MT	PROJECT NUMBER:	0012703AA
CHECKED BY:		SOURCE: GSC FIELD RESEARCH	
DATE:	JANUARY 23, 2003		

GEOLOGIC SERVICES CORPORATION
Hydrogeologists and Environmental Scientists
484 Temple Hill Rd., Suite 100 New Windsor, NY 12553 (845)561-9890



LEGEND

- BEDROCK MONITORING WELL LOCATION
- OVERBURDEN MONITORING WELL LOCATION
- ABANDONED / DESTROYED WELL LOCATION
- POTABLE WELL LOCATION
- CATCH BASIN
- MONITORING WELL IDENTIFICATION (MW-4) / WATER TABLE ELEVATION (ft) (82.36) / TOTAL BTEX CONCENTRATION (µg/l) (BDL) / MTBE CONCENTRATION (µg/l) (2.1)
- PROPERTY LINE
- BDL — BELOW DETECTION LIMIT
- NC — NOT CALCULATED
- NS — NOT SAMPLED
- ASSUMED GROUNDWATER FLOW DIRECTION
- WATER TABLE CONTOUR (0.5 ft Interval)

NOTES

1. Groundwater samples were collected on December 4, 2002 by Geologic Services Corporation.
2. Monitoring wells MW-4, MW-5, MW-6, and MW-8 are bedrock wells. Monitoring well MW-7 is an overburden well and was not included in groundwater contouring.

SCALE

0 25 50

1 inch = 25 feet

FIGURE 2
HYDROCARBON DISTRIBUTION/ GROUNDWATER CONTOUR MAP

FORMER SHELL SERVICE STATION
ROUTE 52 & BLUE HILL ROAD
EAST FISHKILL, NEW YORK

DRAWN BY:	JG	SCALE:	1" = 25'
REVISED BY:	MT	PROJECT NUMBER:	0012703.AA
CHECKED BY:	--	SOURCE: ENVIROTRAC BASEMAP & GSC FIELD DATA	
DATE:	JANUARY 16, 2003		

GEOLOGIC SERVICES CORPORATION
Hydrogeologists and Environmental Scientists
484 Temple Hill Rd., Suite 100 New Windsor, NY 12553 (845)561-9890

FIGURE 3
Summary of Water Quality - 128 Blue Hill Road

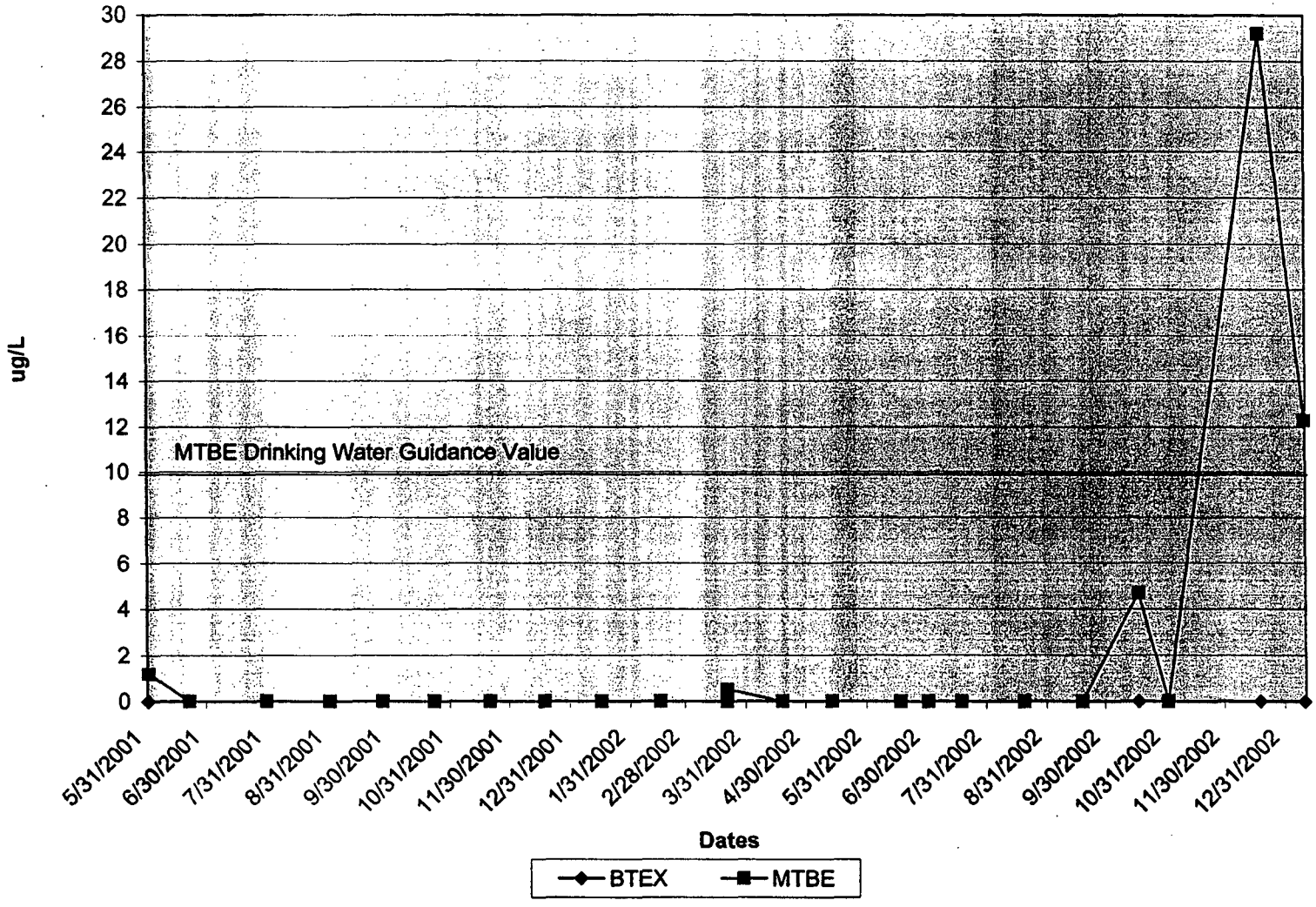


FIGURE 4
Summary of Water Quality - 2421 Route 52

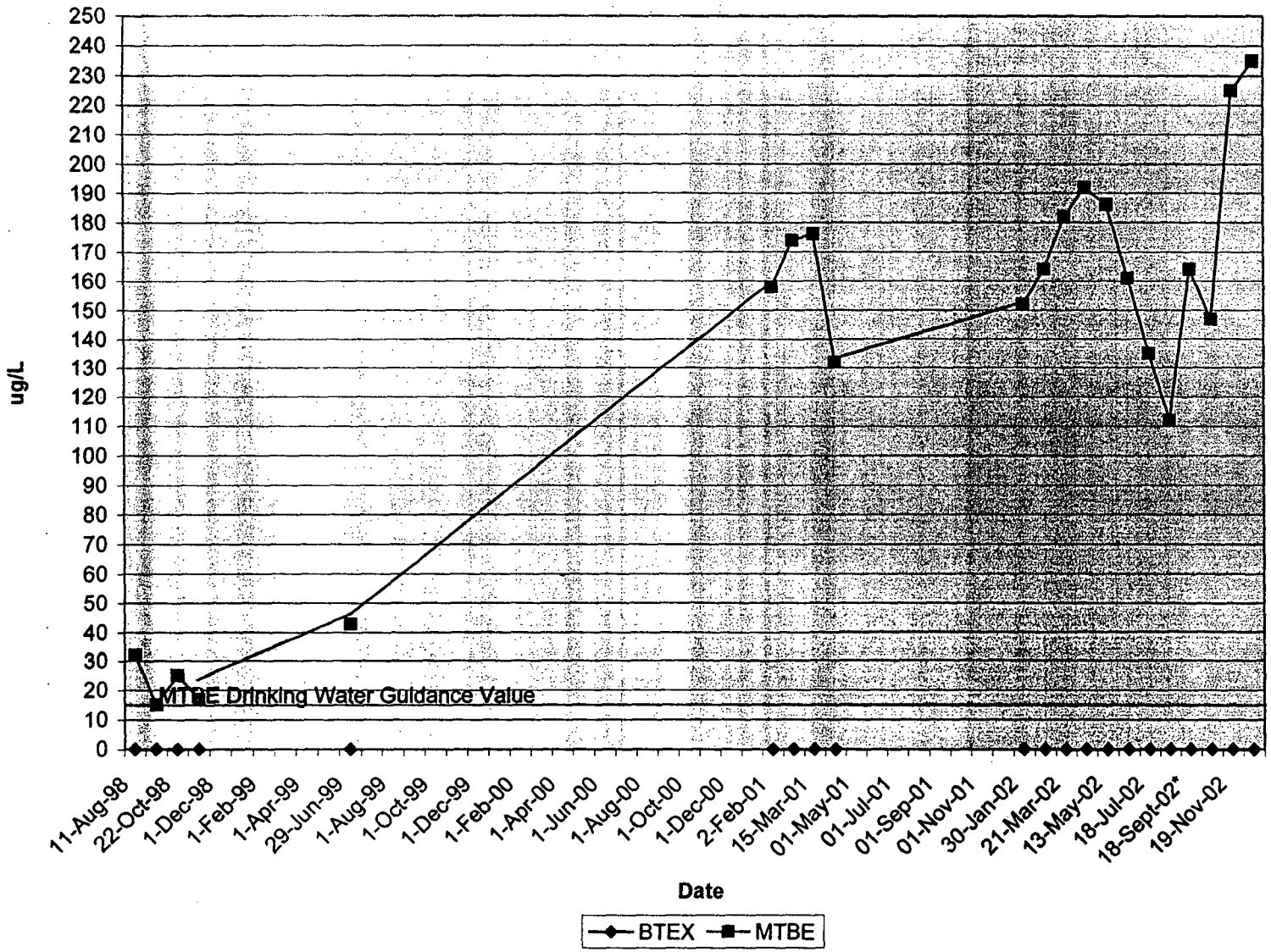
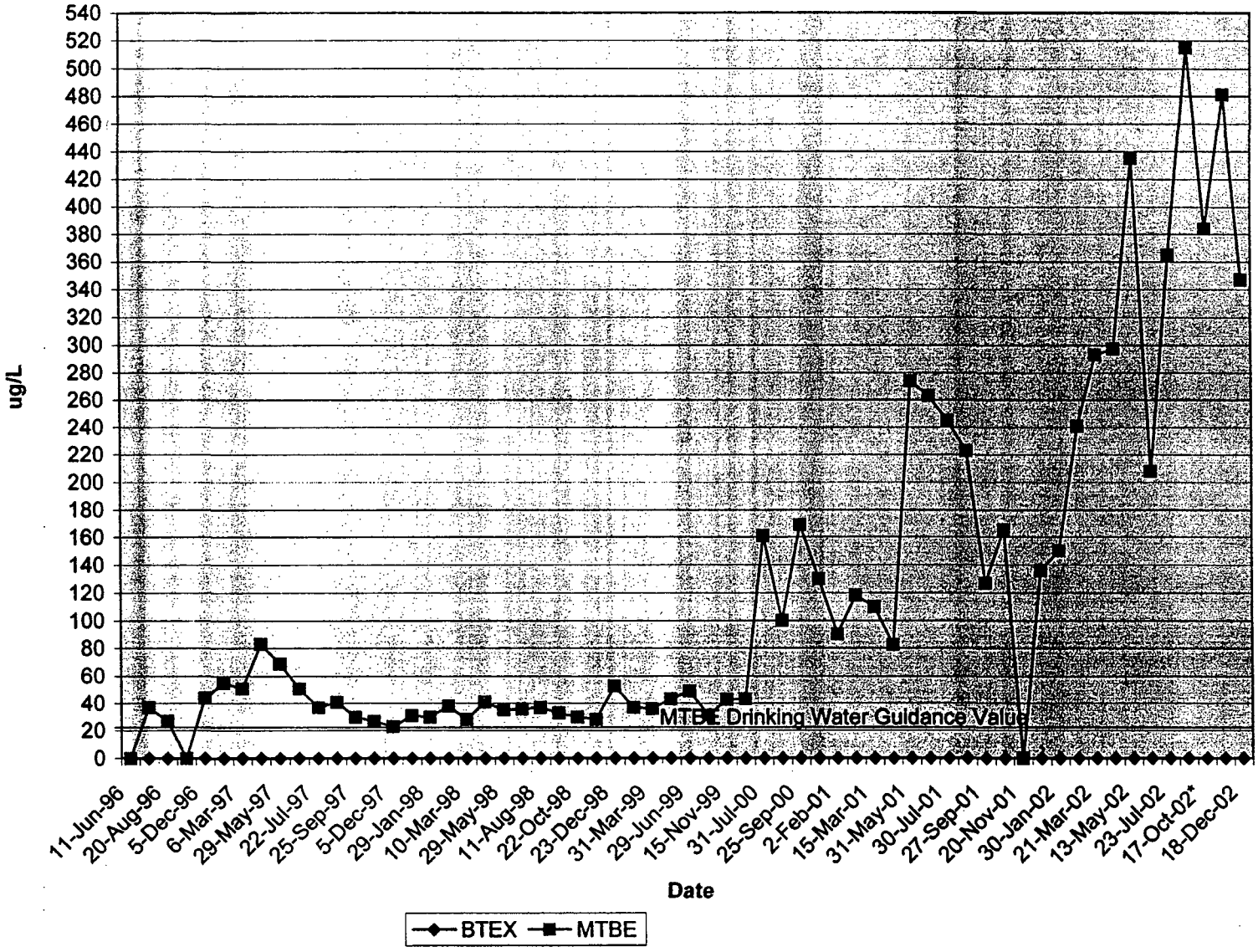


FIGURE 5
Summary of Water Quality - 2427 Route 52



Appendices

Appendix A
Laboratory Sample Analytical Report and Chain of Custody
Groundwater Data

Appendix B
Laboratory Sample Analytical Report and Chain of Custody
Potable Well Data

Dorson
Environmental
Management, Inc.

Pre-Acquisition Site Assessments
Remediation
Compliance Issues
Claims Oversight

SPILL CLOSURE REPORT
NYSDEC SPILL # 9908092

FILE COPY

FEB 2 0 2000

for property at:

Dutchess

RESIDENTIAL PROPERTY
27 OLD STATE ROAD
HOPEWELL JUNCTION, NEW YORK 12533

Prepared For:

MR. VINCENT MCCABE
NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
REGION III OFFICE
21 SOUTH PUTT CORNERS ROAD
NEW PALTZ, NEW YORK 12561-1696

Prepared By:

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FEBRUARY 25, 2000

REPORT PREPARED AND

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Thomas V. Gallinger
Senior Consultant

Dorson
Environmental
Management, Inc.

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APPENDIX B - Soil Boring Location Map

APPENDIX C - Potable Well Sampling Results

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APPENDIX E - Soil Analytical Results for December 16, 1999

APPENDIX F - Subsurface Soil Assessment Diagram

APPENDIX G - Soil Excavation Diagram

APPENDIX H - Soil Analytical Results for January 27 - 28 and February 1, 2000

1.0 INTRODUCTION

Dorson performed remediation oversight and site assessment activities at 27 Old State Road in Hopewell Junction, New York. The objective of these activities was i.) to identify and remediate the fuel oil release which occurred at the site property; ii.) to effectively remove all accessible petroleum-contaminated soils; and iii.) to document acceptable site conditions, following remediation, consistent with the New York State Department of Environmental Conservation (NYSDEC) guidelines.

2.0 BACKGROUND

The site property located at 27 Old State Road was previously heated by an oil-burning furnace fueled by a 1,000-gallon underground storage tank (UST) that was located off of the southeast corner of the insured's home. This UST was reportedly installed approximately 27 years ago, at the time of the house's construction. A potable well located off of the northeast corner of the house provides drinking water to the insured's property. The well was reportedly installed to a depth of approximately 300 feet. In April of 1999, a radon ventilation system was reportedly installed in the basement of the house. During the installation of four-inch PVC piping for this radon system, a portion of the basement floor was removed in the vicinity of the old feed and return lines for the home's former 1,000-gallon UST. The previous homeowner, Mr. John Dreier, reported that following the installation of the radon ventilation system, the UST required fuel oil deliveries on June 10, 1999 and on July 29, 1999. Mr. Dreier suspected a problem and contacted his fuel oil company. Following the fuel oil delivery on July 29, 1999, the tank's feed and return lines were replaced

Mr. Dreier retained Ira D. Conklin and Sons, Inc. ("Conklin" or "the contractor") to sample the site's potable well. Conklin performed the well sampling on November 5, 1999. At that time, the contractor suspected a fuel oil leak in the tank's old feed and return lines located in the basement. Conklin proceeded to drill three core holes at the following locations in the basement: 1.) the northwest corner near the rear basement door; 2.) in the pantry located at the southern wall near the radon ventilation system piping; and 3.) In the southwest storage room. Petroleum-contaminated soils were found beneath the pantry in the southern portion of the basement. The leak was reported

to the New York State Department of Environmental Conservation (NYSDEC) and Spill # 9908092 was issued for the incident.

3.0 SUMMARY OF ACTIVITIES

3.1 Preliminary Subsurface Investigation - November 19, 1999

Dorson conducted a preliminary subsurface investigation outside of the insured's home on November 19, 1999. The objective of this preliminary investigation was to identify contaminated soils, if any, located on the exterior portion of the property. A total of six soil borings were attempted at the property, in the following locations: south of the tank area, adjacent to the guest house and in the western yard area. See **Appendix B** for Soil Boring Location Map. The following table lists the locations of the borings, the depths of the borings, and the field observations.

Soil Boring #	Soil Boring Location	Total Depth of Boring	Field Observations
B-1	South of UST	7 feet	No petroleum staining / No odors observed
MW-1	Southeast Corner of House	11 feet	No petroleum staining / No odors observed
B-2	Southwest Corner of House	9 feet	No petroleum staining / No odors observed
B-3	Northeast Corner of Guest House	4 feet	No petroleum staining / No odors observed
B-4	Western Yard Area	Refusal at 2 feet	Bedrock at 2 feet
B-5	Western Yard Area	Refusal at 2 feet	Bedrock at 2 feet
B-6	Western Yard Area	Refusal at 2 feet	Bedrock at 2 feet

A groundwater monitoring well was installed at the southeast corner of the house. The purpose of this testing was to determine if accessible contaminated soil and/or groundwater existed at the southeast corner of the house. Groundwater was not encountered from the surface to rock at 11 feet. Soils encountered were field screened with a calibrated photoionization detector (PID) and no soil contamination was found from 0 - 11 feet. The drill rig encountered a solid rock layer at 11 feet and drilling was terminated.

3.2 UST Removal - December 2, 1999

The site's 1,000-gallon UST was excavated from the ground on December 2, 1999 by Ira D. Conklin. No holes were observed in the tank shell. The tank excavation measured approximately 9 feet long by 6 feet wide by 6 feet deep. Approximately 1 cubic yard (CY) of suspected, petroleum-contaminated soil was removed from the tank excavation and was stockpiled on-site for disposal. A composite soil sample from the bottom of the excavation was field screened and indicated no contamination.

3.3 Potable Well Sampling - December 16, 1999

Dorson collected a water sample from the site's potable well on December 6, 1999. The well is located approximately 50 feet to the north and crossgradient from the spill area. The water sample was submitted to a New York State Department of Health (NYSDOH)-certified laboratory (# 11634) for analysis by United States Environmental Protection Agency (US EPA) Method 524.2 for the detection of volatile organic compounds (VOCs). No VOCs were detected in the sample. Another round of potable water sampling is scheduled for March 2000 and those results will be forwarded to the DEC. See **Appendix C** for Potable Well Sampling Results.

3.4 Former Feed and Return Line Inspection - December 16, 1999

Dorson was on-site on December 16, 1999 to inspect the old feed and return lines for the former UST. The former feed and return lines enter the house at the southeast corner and run from east to west, under the southern basement floor. Approximately 23 feet of these lines are located beneath the basement floor slab. Pat Corsetti Contracting, Inc. ("Corsetti" or "the contractor") utilized a masonry circular saw to cut the entire length of the basement floor to expose these lines for inspection. An "inverted" break was observed and documented in the feed and return lines which are located approximately 5 - 6 inches from the PVC piping for the radon ventilation system, in the southern portion of the basement. See **Appendix D** for Site Photographs. In addition, petroleum-contaminated soils were observed in the area of the damaged lines. No other damage was observed in any other portion of the former feed and return lines. **Dorson** concludes that the oil return line was damaged by the radon system installation which resulted in the oil spill.

EXECUTIVE SUMMARY

Pursuant to the direction of direction of Mr. John Dreier, **Dorson Environmental Management, Inc. ("Dorson")** conducted remediation and site assessment activities at 27 Old State Road ("site property" or "the insured's property") in Hopewell Junction, New York. This work was performed to identify and remediate a fuel oil release which was reported at the site property on November 5, 1999. See **Appendix A** for General Location Map.

OBJECTIVE:

The objective of these activities was: i.) to identify and remediate the oil contamination identified beneath the basement floor slab; ii.) to effectively remove all accessible petroleum-contaminated soils; and iii.) to document acceptable site conditions, following remediation, consistent with the New York State Department of Environmental Conservation (NYSDEC) guidelines.

FINDINGS:

Based on the post excavation laboratory analytical results, all recoverable petroleum-contaminated soils have been successfully removed from beneath the basement floor slab. Due to the presence of the house foundation, located to the east and south of the excavation, additional removal of petroleum-contaminated soils cannot be performed.

RECOMMENDATIONS:

Dorson requests that Spill # 9908092 be closed and removed from the New York State Department of Environmental Conservation (NYSDEC) list of active petroleum spills. This report presents a summary of all field activities conducted as part of the investigation and includes supporting laboratory analytical.

1.0 INTRODUCTION

Dorson performed remediation oversight and site assessment activities at 27 Old State Road in Hopewell Junction, New York. The objective of these activities was i.) to identify and remediate the fuel oil release which occurred at the site property; ii.) to effectively remove all accessible petroleum-contaminated soils; and iii.) to document acceptable site conditions, following remediation, consistent with the New York State Department of Environmental Conservation (NYSDEC) guidelines.

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3.5 Limited Subsurface Soil Assessment - December 16, 1999

3.5.1 Observation Trenches

Following the inspection of the former feed and return lines on December 16, 1999, **Dorson** directed the contractor to dig a series of four observation trenches across the basement floor, along the area of the former feed and return lines. The trenches were dug to a depth of approximately 30 - 32 inches below the floor slab. **Dorson** personnel collected a total of nine soil samples from the trenches, to determine the extent of petroleum contamination in this area of the basement.

3.5.2 Field Measurement Procedures

Trace gas analysis of soil samples in the field was performed as a gross assessment of potential contamination with a portable Mini Rae 2000 Photoionization Detector (PID). The PID provides a direct reading of the concentration of volatile organic gases in the sample in parts per million (ppm). Immediately following collection, each soil sample was transferred to a glass container. The open container was sealed with clear plastic wrap and agitated to break apart the soil and distribute gases. The probe of the PID was inserted through the plastic into the confined headspace of the jar and readings were recorded and compared to ambient background levels. This field screening method provides a relative concentration of volatile organic compounds that is useful for a quick comparison of samples. A higher needle deflection or ppm reading on the instrument indicates a higher concentration of volatile organic compounds. The following table lists the samples collected, the depths of the samples and the PID readings.

Sample #	Location	PID Reading (In parts per million, *ppm*)
DR1216-01	8'6" east of line damage; 1' north of line damage; 2'6" deep	83.4
DR1216-02	1'6" east of line damage; 1' north of line damage; 2'8" deep	131.0
DR1216-03	0" east of line damage; 1' north of line damage; 0" deep	76.6
DR1216-04	8' east of line damage; 1' north of line damage; 0" deep	50.8
DR1216-05	0" east of line damage; 2" south of line damage; 0" deep	65.6
DR1216-06	3' west of line damage; 1' north of line damage; 0" deep	109.0
DR1216-07	3'4" west of line damage; 1' north of line damage; 2'6" deep	53.5
DR1216-08	9'6" west of line damage; 1' north of line damage; 0" deep	56.2
DR1216-09	7'11" west of line damage; 1' north of line damage; 0" deep	51.5

3.5.3 Soil Analytical Results

One soil sample (DR1216-02) was submitted to a NYSDOH-certified laboratory (# 11634) for analysis by US EPA Method 8260 for the detection of volatile organic compounds (VOCs) and by US EPA Method 8270 for the detection of semi-volatile organic compounds (SVOCs). The following table lists the analytical results and compares them to the *New York State Department of Environmental Conservation (NYSDEC) Spill Technology and Remediation Series (STARS) Petroleum-Contaminated Soils Guidance Policy* values. Please note that only those compounds which were detected in the laboratory analysis, are indicated in the tables. <u>See</u> **Appendix E** for a complete listing of Soil Analytical Results.

Volatile Organic Compounds Results - EPA Method 8260 (ug/L or ppb)

Sample #	Depth of Sample (Feet)	Analyte	Results (ppb)	NYSDEC STARS Value (ppb)
DR1216-02	2.8	Benzene	27*	14
		Toluene	626*	100
		Ethylbenzene	121*	100
		m+p Xylenes	974*	100
		o-Xylene	1,710*	100
		Isopropylbenzene	138*	100
		1,3,5-Trimethylbenzene	1,270*	100
		tert-Butylbenzene	827*	100
		1,2,4-Trimethylbenzene	2,530*	100
		sec-Butylbenzene	844*	100
		4-Isopropyltoluene	358	NS

* Note: Exceeds NYSDEC STARS values.
NS = No Reported Standard

Semi-Volatile Organic Compounds Results - EPA Method 8270 (ug/L or ppb)

Sample #	Depth of Sample (Feet)	Analyte	Results (ppb)	NYSDEC STARS Value (ppb)
DR1216-02	2.8	N-nitroso-di-n-propylamine	3,820	NS
		Acenaphthylene	2,010	NS
		Acenaphthene	9,550*	400
		2,4-Dinitrotoluene	4,820	NS
		Fluorene	7,510*	1,000
		Phenanthrene	21,400*	1,000
		Pyrene	4,960*	1,000
		Benzo[a]anthracene	1,280*	0.04

* Note: Exceeds NYSDEC STARS values.
NS = No Reported Standard

The laboratory results for Sample # DR1216-02 indicated that recoverable petroleum-contaminated soils, which exceed the NYSDEC STARS values, are located in the area of the former feed and return lines. Based upon these results, **Dorson** recommended that accessible contaminated soils be removed from the basement.

4.0 SOIL REMOVAL ACTIVITIES

4.1 Limited Subsurface Soil Assessment - January 14, 2000

On January 14, 1999 **Dorson** conducted a limited subsurface soil assessment to determine the extent of petroleum-contaminated soils beneath the basement floor. **Dorson** personnel drilled 21 holes across the basement floor, to a maximum depth of 16 inches. The holes were screened for volatile organic vapors utilizing a portable Mini Rae 2000 Photoionization Detector (PID). The following table lists the assessment points and the PID readings. The PID readings confirmed that contaminated soils existed in the basement, beginning at the location of the radon vent and extending outward to the north and west. Based on the field screening results, endpoints to soil contamination were identified approximately half way across the basement floor to the north and in the boiler room to the west.

Assessment Point #	PID Readings (ppm)
1	135 - 420
2	110 - 400
3	115 - 172
4	19 - 25
5	12
6	8 - 10
7	7
8	8
9	35
10	155
11	50
12	11
13	9
14	7
15	6
16	5
17	5

18	120
19	40
20	7
21	7

4.2 Soil Removal - January through February 2000

Activities in preparation of soil removal from the basement began on January 19, 2000. The walls and stairs leading to the upstairs were sealed with plastic to minimize odors and dust to the living space. At that time, Al Corsetti Contracting, Inc. ("Corsetti" or "the contractor") began removing the concrete floor slab in the basement pantry and outward, towards the area of the radon ventilation system. Contaminated soils were hand-excavated and wheeled to a 20 yard roll-off container located on the site driveway. **Dorson** provided a charcoal filter to the homeowner to minimize fuel oil odors in the house. In addition, an explosion-proof exhaust fan was utilized to minimize fuel oil odors in the basement during the work. During the period of January 19, 21, 24, 27 and 28, 1999, approximately 25 tons of contaminated soil were removed. The excavation was terminated at the building foundation wall, located to the south and east. These soils beneath the building footer cannot be removed. Excavation of soils continued to the north until field screening results indicated little or no remaining contamination. The excavation was extended to the base of the stairs and to the closet located to the west.

A site meeting was held on January 28, 1999, with NYSDEC representative, Mr. Vincent McCabe, to discuss the progress of the soil removal. At this meeting, it was determined that soils beneath the basement stairs would have to be removed. The stairs were taken apart on February 1, 2000 to facilitate additional soil removal. The excavation of soils beneath the stairs measured approximately 8 feet long by 4 feet wide by 4 feet deep. The excavation was extended depthwise to the rock ledge located approximately 3-4 feet below the basement floor. Approximately 7 tons of contaminated soil were removed from beneath the stairs. Backfilling of the excavation was completed on February 2, 2000. See **Appendix G** for Soil Excavation Diagram. Prior to the completion of the backfilling, PVC piping for a soil vapor extraction system was installed beneath the basement floor slab. The system was set up as a precautionary measure for future use if

petroleum odors persist in the basement, following the soil removal. It should be noted that no petroleum odors have been detected in the house since the floor was restored and future use of the sub-floor piping is not expected. See **Appendix D** for Site Photographs.

4.3 Sample Equipment Decontamination

During the soil excavation, **Dorson** personnel collected soil samples to determine endpoints to the contamination. Samples were collected with disposable trowels to preclude any cross-contamination. Field personnel collected samples with sterile gloves which were discarded following each collection.

4.4 Preparation for Laboratory Analysis

Immediately following collection, each sample was transferred to an EPA-approved glass container with a Teflon-lined lid and stored in a portable cooler at a temperature of <4° C. Sample selection for analysis was based on presence of odors, PID readings and site conditions. Samples were submitted to a NYSDOH-certified laboratory (# 10854) for analysis. Each jar was affixed with a label bearing the job number, date, time, initials of sampler, boring number, sample location and analytical parameter.

Laboratory analysis was performed by the following US EPA-approved methodologies utilizing Gas Chromatograph (GC) and / or Mass Spectrophotometry (MS): 1) Method 8260 was performed to detect volatile organic compounds in the soils and Method 8270 was performed to identify semi-volatile compounds in the soils.

4.5 Post-Excavation Soil Analytical Results

Dorson's field scientists collected samples at depths depicted in the following table at four locations to identify endpoints to soil contamination in the basement. Results of the samples analyzed using US EPA Method 8260 for the detection of volatile organic compounds and US EPA Method 8270 for the detection of semi-volatile organic compounds are indicated on the following tables. Please note that only those compounds which were detected in the laboratory analysis, are indicated in the tables. See **Appendix H** for a complete listing of Soil Analytical Results.

Volatile Organic Compounds Results - EPA Method 8260 (ug/L or ppb)

Sample Location	Depth of Sample (Feet)	Analyte	Results (ppb)	NYSDEC STARS Value (ppb)
East Wall	Composite Sample at 2.5 feet	1,2,4-Trimethylbenzene	87	100
		1,3,5-Trimethylbenzene	56	100
		Naphthalene	20	200
		o-Xylene	18	100
		m+p-Xylene	10	100
		Total Xylenes	28	100
		p-Isopropyltoluene	12	100
		Toluene	12	100
North Wall	Composite Sample at 3.5 feet	1,2,4-Trimethylbenzene	5	100
		Naphthalene	15	200
		Toluene	14	100
South Wall	Composite Sample at 3 feet	1,2,4-Trimethylbenzene	740*	100
		1,3,5-Trimethylbenzene	220*	100
		Ethylbenzene	37	100
		Isopropylbenzene	33	100
		n-Butylbenzene	150*	100
		n-Propylbenzene	65	100
		o-Xylene	230*	100
		m+p-Xylene	220*	100
		p-Isopropyltoluene	86	100
		sec-Butylbenzene	96	100
		Toluene	51	100
Beneath Stairs	2 feet	All	ND	14 - 200
Floor	Composite Sample at 4 feet	All	ND	14 - 200

* Note: Exceeds NYSDEC STARS values.
All = See Appendix H for a complete listing of analytes
ND = Non Detect

Semi-Volatile Organic Compounds Results - EPA Method 8270 (ug/L or ppb)

Sample Location	Depth of Sample (Feet)	Analyte	Results (ppb)	NYSDEC STARS Value (ppb)
East Wall	Composite Sample at 2.5 feet	Acenaphthene Fluorene Naphthalene Phenanthrene Pyrene	630* 1,500* 1,800* 2,000* 370	400 1,000 200 1,000 1,000
North Wall	Composite Sample at 3.5 feet	All	ND	0.04 - 1,000
South Wall	Composite Sample at 3 feet	Acenaphthene Fluorene Naphthalene Phenanthrene	4,800* 8,200* 5,900* 12,000*	400 1,000 200 1,000
Beneath Stairs	2 feet	All	ND	0.04 - 1,000
Floor	Composite Sample at 4 feet	All	ND	0.04 - 1,000

* Note: Exceeds NYSDEC STARS values.
All = See Appendix H for a complete listing of analytes
ND = Non Detect

Dorson compared the results of the Method 8260 and Method 8270 laboratory analyses with the *New York State Department of Environmental Conservation (NYSDEC) Spill Technology and Remediation Series (STARS) Memo #1: Petroleum-Contaminated Soil Guidance Policy* values. No volatile or semi-volatile organic compounds exceeding the NYSDEC STARS values remain on the floor of the excavation, north wall, or from beneath the stairs (west wall). Elevated levels of volatile and semi-volatile organic compounds, exceeding the NYSDEC STARS values, remain along the building footer and at the south and east walls.

5.0 DISCUSSION

Based on the post excavation laboratory analytical results, petroleum-contaminated soils have been successfully removed, to the extent possible, from beneath the basement floor slab. All post-excavation soil results for the floor, north and west walls indicate no remaining petroleum contamination. Soil contamination remains immediately beneath the building footer on the south and east wall of the excavation. Test borings completed on the southeast exterior of the house in this area encountered no petroleum contaminated soil from grade to rock at approximately 10 feet. Shallow bedrock exists immediately south of the completed excavation, behind the south wall of the basement. **Dorson** concludes that all accessible petroleum contaminated soils have been remediated.

6.0 RECOMMENDATIONS

Dorson requests that Spill # 9908092 be closed and removed from the New York State Department of Environmental Conservation (NYSDEC) list of active petroleum spills.

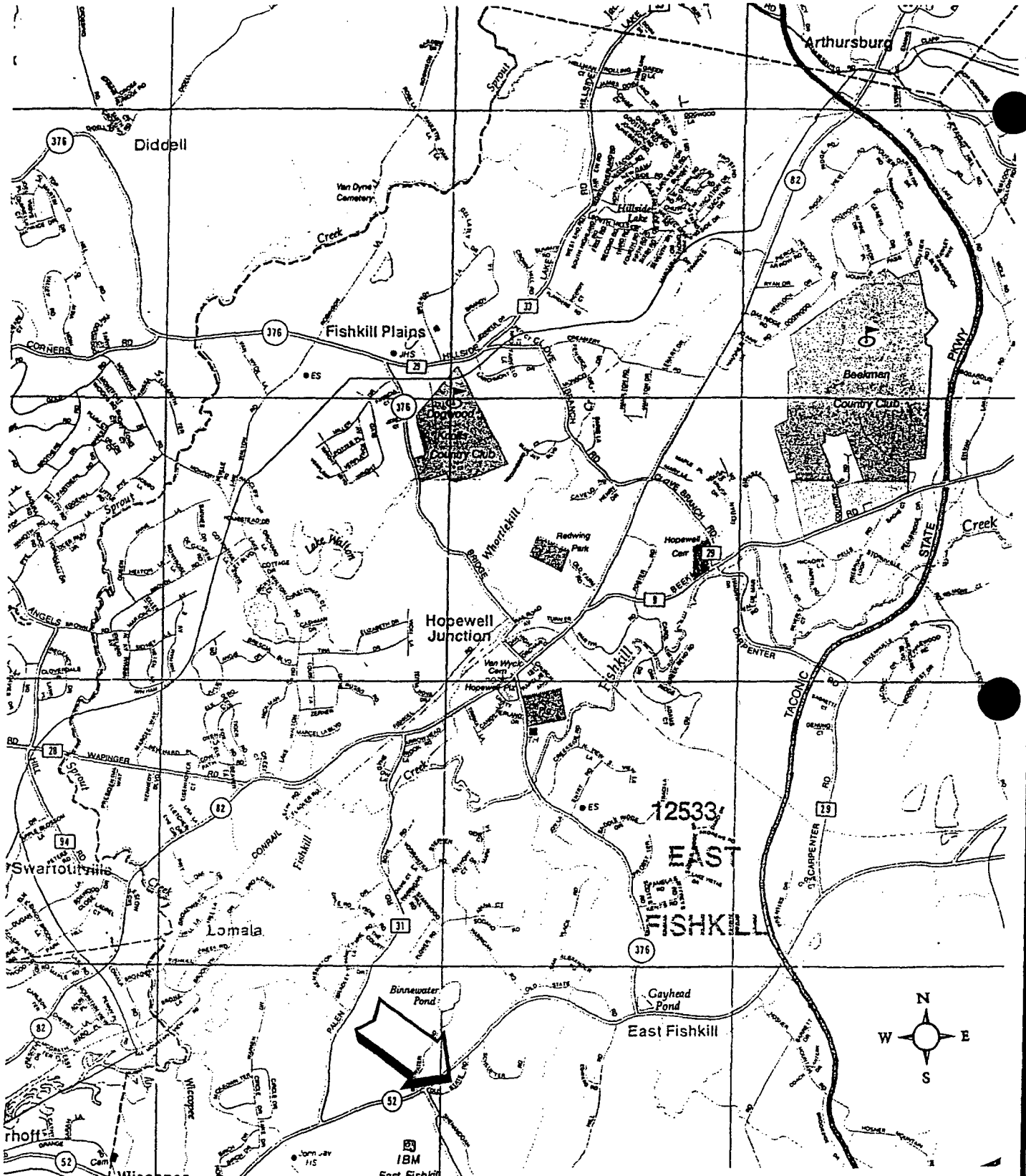
7.0 DISCLAIMER

This investigation was performed by an environmental professional with experience in the environmental assessment field. The report is consistent with generally accepted protocols within the environmental consulting industry. **Dorson,** however, cannot guarantee that the property is completely free of environmental impairment and associated liability.

APPENDIX A

General Location Map

Dorson 45 Knollwood Road Elmsford, New York 10523 (914) 592-3117 Fax No. (914) 592-4051



GENERAL LOCATION MAP

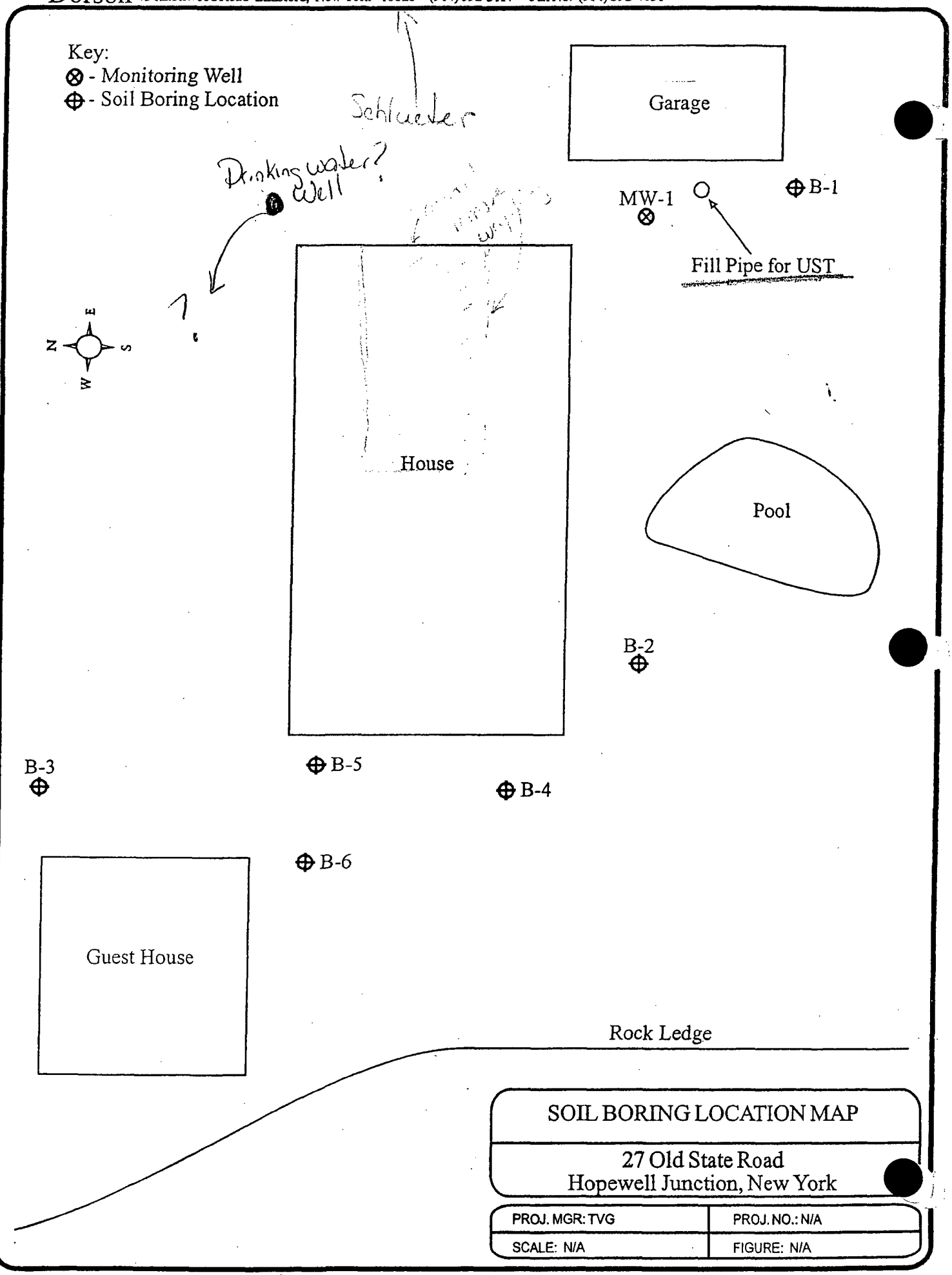
27 Old State Road
Hopewell Junction, New York

PROJ. MGR: TVG	PROJ. NO.: N/A
SCALE: N/A	FIGURE: N/A

APPENDIX B

Soil Boring Location Map

Dorson 45 Knollwood Road Elmsford, New York 10523 (914) 592-3117 Fax No. (914) 592-4051



SOIL BORING LOCATION MAP

27 Old State Road
Hopewell Junction, New York

PROJ. MGR: TVG	PROJ. NO.: N/A
SCALE: N/A	FIGURE: N/A

APPENDIX C

Potable Well Sampling Results

AQUA PRO-TECH LABS
Method 524.2 Analytical Report

SAMPLE NO.
99120362-1

Client: DORSON ENVIRONMENTAL

Project No.: DREIER TAP

Location: DREIER RESIDENCE

Matrix: WATER

Lab Sample ID: 120362-1

Sample wt/vol: 20.0 (g/mL) ML

GC/MS File ID: V15145.D

Level: (low/med)

Date Received: 12/7/99

Date Analyzed: 12/19/99

Dilution Factor: 1.0

CAS No.	Compound	Concentration Units: (ug/L or ug/Kg) ug/L	Qualifier
75-71-8	Dichlorodifluoromethane	0.3	U
74-87-3	Chloromethane	0.4	U
75-01-4	Vinyl Chloride	0.4	U
74-83-9	Bromomethane	0.2	U
75-00-3	Chloroethane	0.6	U
75-69-4	Trichlorofluoromethane	0.1	U
67-64-1	Acetone	9.4	U
60-29-7	Diethyl Ether	0.2	U
75-35-4	1,1-Dichloroethene	0.3	U
75-65-0	tert-Butyl Alcohol	0.4	U
107-05-1	Allyl Chloride	0.5	U
76-65-0	Methyl Iodide	0.2	U
75-09-2	Methylene Chloride	0.1	U
75-15-0	Carbon Disulfide	0.3	U
107-13-1	Acrylonitrile	0.5	U
1634-04-4	Methyl tert-Butyl Ether	0.1	U
156-60-5	trans-1,2-Dichloroethene	0.1	U
75-34-3	1,1-Dichloroethane	0.1	U
78-93-3	2-Butanone(MEK)	4.3	U
96-33-3	Methyl Acrylate	0.2	U
594-20-7	2,2-Dichloropropane	0.3	U
156-59-2	cis-1,2-Dichloroethene	0.1	U
74-97-5	Bromochloromethane	0.1	U
109-99-9	Tetrahydrofuran	0.5	U
67-66-3	Chloroform	0.1	U
107-12-0	Propionitrile	0.8	U
126-98-7	Methacrylonitrile	0.2	U
109-69-3	1-Chlorobutane	0.1	U
71-55-6	1,1,1-Trichloroethane	0.1	U
56-23-5	Carbon Tetrachloride	0.1	U
563-58-6	1,1-Dichloropropene	0.1	U
71-43-2	Benzene	0.1	U
107-06-2	1,2-Dichloroethane	0.1	U

AQUA PRO-TECH LABS
Method 524.2 Analytical Report

SAMPLE NO.
99120362-1

Client: DORSON ENVIRONMENTAL

Project No.: DREIER TAP

Location: DREIER RESIDENCE

Matrix: WATER

Lab Sample ID: 120362-1

Sample wt/vol: 20.0 (g/mL) ML

GC/MS File ID: V15145.D

Level: (low/med)

Date Received: 12/7/99

Date Analyzed: 12/19/99

Dilution Factor: 1.0

CAS No.	Compound	Concentration Units: (ug/L or ug/Kg) ug/L	Qualifier
80-62-6	Methyl Methacrylate	0.2	U
79-01-6	Trichloroethene	0.1	U
78-87-5	1,2-Dichloropropane	0.1	U
75-27-4	4-Methyl-2-Pentanone (MIBK)	3.2	U
107-14-2	Chloroacetonitrile	5.1	U
74-95-3	Dibromomethane	0.1	U
513-88-2	1,1-Dichloropropanone	5.5	U
79-46-9	2-Nitropropane	7.4	U
75-27-4	Bromodichloromethane	0.1	U
97-63-2	Ethyl Methacrylate	0.3	U
10061-01-5	cis-1,3-Dichloropropene	0.1	U
591-78-6	2-Hexanone	3.6	U
108-88-3	Toluene	0.1	U
10061-02-6	trans-1,3-Dichloropropene	0.3	U
79-00-5	1,1,2-Trichloroethane	0.1	U
127-18-4	Tetrachloroethene	0.1	U
142-28-9	1,3-Dichloropropane	0.1	U
124-48-1	Dibromochloromethane	0.1	U
106-93-4	1,2-Dibromoethane	0.1	U
108-90-7	Chlorobenzene	0.1	U
630-20-6	1,1,1,2-Tetrachloroethane	0.1	U
100-41-4	Ethylbenzene	0.1	U
108-38-3	m+p-Xylenes	0.2	U
764-41-0	trans-1,4-Dichloro-2-Butene	0.4	U
95-47-6	o-Xylene	0.1	U
100-42-5	Styrene	0.1	U
76-01-7	Pentachloroethane	0.2	U
75-25-2	Bromoform	0.1	U
98-82-8	Isopropylbenzene	0.1	U
108-86-1	Bromobenzene	0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U
96-18-4	1,2,3-Trichloropropane	0.1	U
103-65-1	n-Propylbenzene	0.1	U

AQUA PRO-TECH LABS
Method 524.2 Analytical Report

SAMPLE NO.
99120362-1

Client: DORSON ENVIRONMENTAL

Project No.: DREIER TAP

Location: DREIER RESIDENCE

Matrix: WATER

Lab Sample ID: 120362-1

Sample wt/vol: 20.0 (g/mL) ML

GC/MS File ID: V15145.D

Level: (low/med)

Date Received: 12/7/99

Date Analyzed: 12/19/99

Dilution Factor: 1.0

CAS No.	Compound	Concentration Units: (ug/L or ug/Kg) ug/L	Qualifier
95-49-8	2-Chlorotoluene	0.1	U
106-43-4	4-Chlorotoluene	0.2	U
108-67-8	1,3,5-Trimethylbenzene	0.1	U
67-72-1	Hexachloroethane	0.1	U
98-06-6	tert-Butylbenzene	0.1	U
95-63-6	1,2,4-Trimethylbenzene	0.3	U
135-98-8	sec-Butylbenzene	0.1	U
541-73-1	1,3-Dichlorobenzene	0.1	U
99-87-6	4-Isopropyltoluene	0.1	U
98-95-3	Nitrobenzene	8.8	U
106-46-7	1,4-Dichlorobenzene	0.1	U
95-50-1	1,2-Dichlorobenzene	0.1	U
104-51-8	n-Butylbenzene	0.1	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	U
120-82-1	1,2,4-Trichlorobenzene	0.1	U
87-68-3	Hexachlorobutadiene	0.2	U
91-20-3	Naphthalene	0.4	U
87-61-6	1,2,3-Trichlorobenzene	0.1	U

Qualifiers:

U = Undetected (number in concentration column is the MDL)
J = Estimated concentration (below the MDL for target compounds)
D = Diluted sample
B = Detected in the method Blank
P = Probable laboratory contaminant

APL

AQUA PRO-TECH LABORATORIES
1275 BLOOMFIELD AVE
BUILDING 6
FAIRFIELD NJ 07004
TEL 973.227.0422
FAX 973.227.2813
CERTIFICATION NUMBERS:
NJDEP # 07010
NYDOH # 11634
CTPH # 0233

CUSTOMER: Dorson	SEND REPORT TO: Dorson
ADDRESS: 45 Knollwood Rd	ADDRESS:
Elmsford NY 10523	
PHONE: 914 592 3117	PHONE:
FAX: 914 592 4057	FAX:
PROJECT NAME: Dreier Residence	SEND INVOICE TO: Dorson
PROJECT MGR: Mike Kennedy	ADDRESS:
P.O. NUMBER: –	SAMPLED BY: mike Kennedy

CHAIN OF CUSTODY

PAGE 1 OF 1

TURNAROUND TIME
- [x] APL STANDARD is 1-2 weeks
- [ ] RUSH turnaround available upon request and lab approval.

REPORT FORMAT
- [x] STANDARD
- [ ] NJ DEP REDUCED DELIVERABLES
- [ ] NJ DEP FULL DELIVERABLES
- [ ] ELECTRONIC DATA DELIVERY SRP#
- [ ] STATE FORMS NEEDED

MATRIX ABBREVIATIONS D\DRINKING WATER, W\WASTE WATER, S\SOIL, SL\SLUDGE

APL LAB ID#	SAMPLE SOURCE \ FIELD ID	DATE	TIME	SAMPLE TYPE GRAB	SAMPLE TYPE COMP	MATRIX	# BOTTLES	PRESERVATIVE	<4°C	pH	ANALYSIS REQUESTED
91263602	Dreier Tap	12/7	5:30p	✓		D	1	HCL			524.2

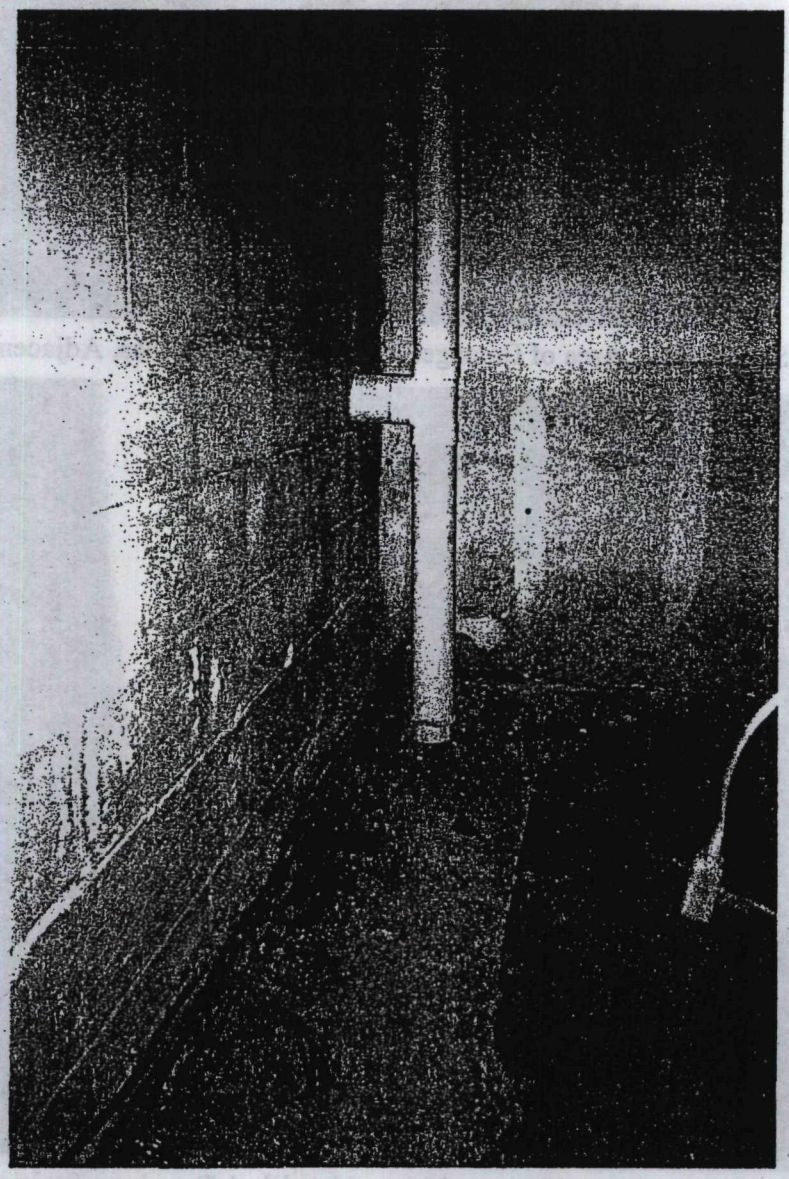
RELINQUISHED BY (Print) Mike Kennedy	DATE 12/7/99	RECEIVED BY (Print) Tom Adams	DATE 12/7/99
Signature/Agent of:	TIME 11 AM PM	Signature/Agent of:	TIME 11 AM PM
RELINQUISHED BY (Print) Tom Kedams	DATE 12/7/99	RECEIVED BY (Print)	DATE 12/7/99
Signature/Agent of:	TIME 3 AM PM	Signature/Agent of:	TIME 3:00 AM PM
RELINQUISHED BY (Print)	DATE / /	RECEIVED BY (Print)	DATE / /
Signature/Agent of:	TIME : AM PM	Signature/Agent of:	TIME : AM PM

COMMENTS/SPECIAL INSTRUCTIONS

APPENDIX D

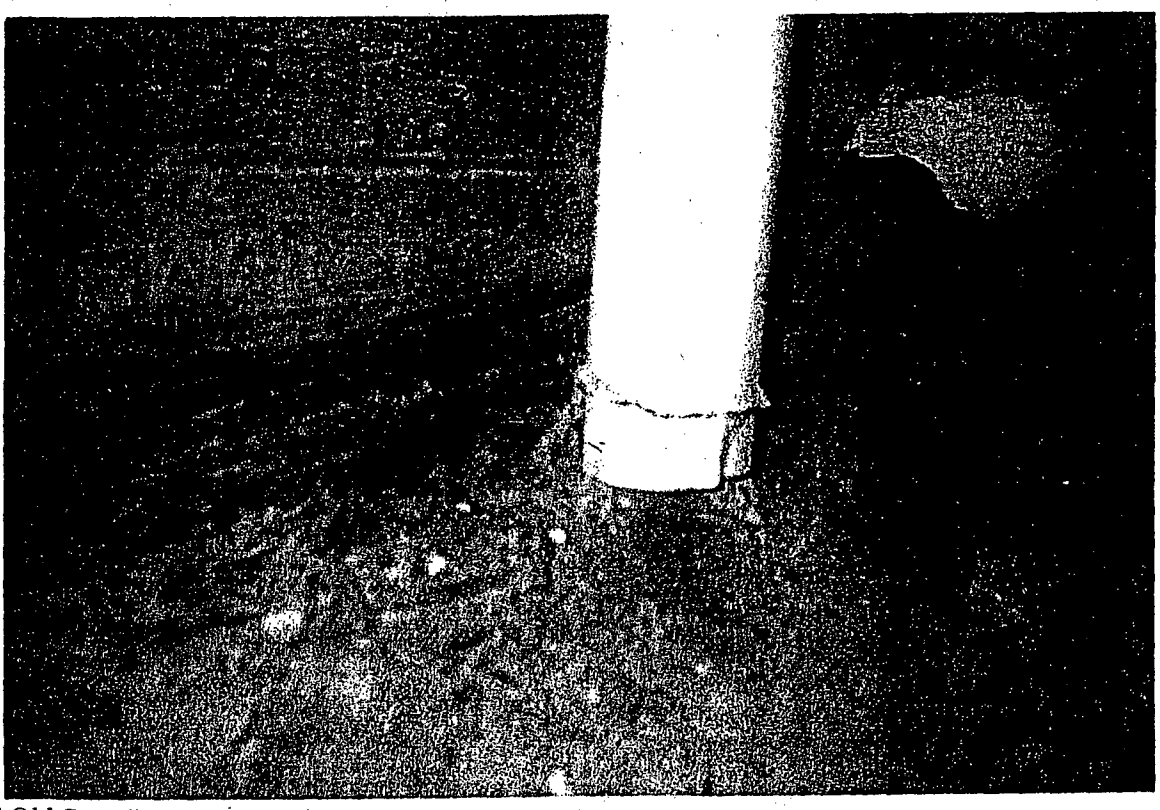
Site Photographs

27 Old State Road - Area of Damaged Feed and Return Lines, Adjacent to Radon Vent (12/16/99)

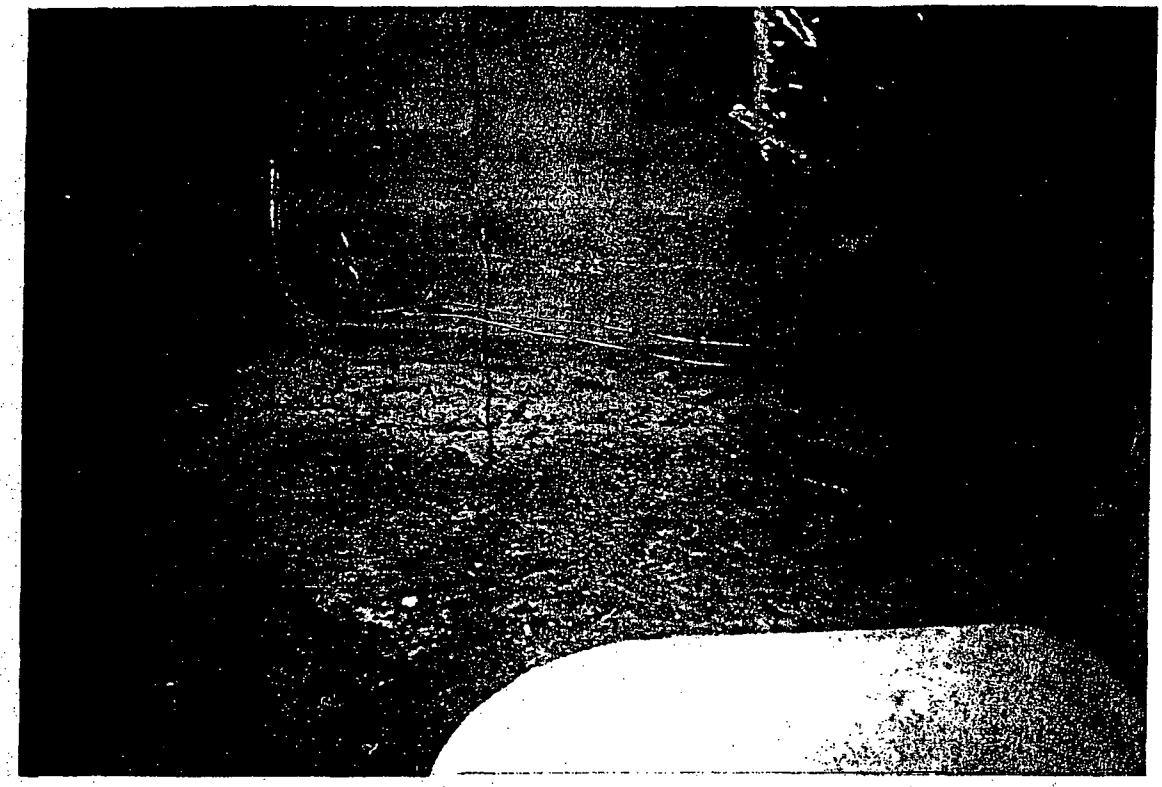


27 Old State Road - Area of Damaged Feed and Return Lines, Adjacent to Radon Vent (12/16/99)

27 Old State Road - Area of Damaged Feed and Return Lines, Adjacent to Radon Vent (12/16/99)



27 Old State Road - Area of Damaged Lines, Note Black Petroleum Staining Adjacent to Lines (12/16/99)



27 Old State Road - Area of Feed and Return Line Trenches (12/16/99)

27 Old State Road - Southeast Corner of Soil Excavation (January / February 2000)

27 Old State Road - Soil Excavation in Main Area of Basement (January / February 2000)

27 Old State Road - Soil Excavation Adjacent to Closet / Stairs (January / February 2000)

APPENDIX E

Soil Analytical Results for December 16, 1999

AQUA PRO-TECH LABORATORIES
EPA Method 624/8260B Analytical Report

Client Sample

DR1216-02

Client: DORSON ENVIRONMENTAL

Project: DRIER RESIDENCE

Matrix: (soil/water) SOIL

Lab Sample ID: 99121134-001

Sample wt/vol: 4.0 (g/ml) G

Lab File ID: VV5623.D

Level: (low/med) LOW

Date Collected: 12/30/1999

% Moisture 6.3

Date Analyzed: 12/30/1999

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UG/KG	Q	MDL
71-43-2	Benzene	27		1.4
108-88-3	Toluene	626		2.5
100-41-4	Ethylbenzene	121		2.0
1330-20-7	m+p-Xylenes	974		3.9
1330-20-7	o-Xylene	1710	E	2.1
98-82-8	Isopropylbenzene	138		2.4
103-65-1	n-Propylbenzene		U	2.2
108-67-8	1,3,5-Trimethylbenzene	1270	E	2.7
98-06-6	tert-Butylbenzene	827		2.4
95-63-6	1,2,4-Trimethylbenzene	2530	E	2.4
135-98-8	sec-Butylbenzene	844		2.9
99-87-6	4-Isopropyltoluene	358		2.4
104-51-8	n-Butylbenzene		U	4.8
91-20-3	Naphthalene		U	2.8

Qualifiers: U - Undetected, J - Estimated Concentration, D - Diluted,

B - Detected in Blank, E - Above Concentration Range

AQUA PRO-TECH LABORATORIES

EPA Method 625/8270C Analytical Report

Client Sample

DR1216-02

Client: DORSON ENVIRONMENTAL

Project: DREIER RESIDENCE

Matrix: (soil/water) SOIL

Sample wt/vol: 30 (g/ml) G

Level: (low/med) LOW

% Moisture: 6.3

Concentrated Extract Volume: 1000 (uL)

Injection Volume: 1.0 (uL)

Lab Sample ID: 99121134-001

Lab File ID: S7260.D

Date Collected: 12/20/1999

Date Extracted: 12/27/1999

Date Analyzed: 1/8/2000

Dilution Factor: 20.0

CAS NO.	COMPOUND	CONCENTRATION: UG/KG	Q	MDL
108-95-2	Phenol		U	943
95-57-8	2-Chlorophenol		U	1360
106-46-7	1,4-Dichlorobenzene		U	1380
621-64-7	N-nitroso-di-n-propylamine	3820	D	1450
120-82-1	1,2,4-Trichlorobenzene		U	270
59-50-7	4-Chloro-3-methylphenol		U	482
208-96-8	Acenaphthylene	2010	D	220
83-32-9	Acenaphthene	9550	D	681
100-02-7	4-Nitrophenol		U	1630
121-14-2	2,4-Dinitrotoluene	4820	D	830
86-73-7	Fluorene	7510	D	709
85-01-8	Phenanthrene	21400	D	326
120-12-7	Anthracene		U	589
206-44-0	Fluoranthene		U	738
129-00-0	Pyrene	4960	D	809
56-55-3	Benzo[a]anthracene	1280	D	241
218-01-9	Chrysene		U	255
205-99-2	Benzo[b]fluoranthene		U	596
207-08-9	Benzo[k]fluoranthene		U	851
50-32-8	Benzo[a]pyrene		U	716
193-39-5	Indeno(1,2,3-cd)pyrene		U	404
53-70-3	Dibenzo[a,h]anthracene		U	809
191-24-2	Benzo[g,h,i]perylene		U	433

Qualifiers: U - Undetected, J - Estimated Concentration, D - Diluted,

B - Detected in Blank, E - Above Concentration Range

APL

AQUA PRO-TECH LABORATORIES
1275 BLOOMFIELD AVE
BUILDING 6
FAIRFIELD NJ 07004
TEL 973.227.0422
FAX 973.227.2813
CERTIFICATION NUMBERS:
NJDEP # 07010
NYDOH # 11634
CTPH # 0233

CUSTOMER: Dorson	SEND REPORT TO: Dorson
ADDRESS:	ADDRESS:
PHONE:	PHONE:
FAX:	FAX:
PROJECT NAME: Dreier CNY	SEND INVOICE TO: Dorson
PROJECT MGR: MK	ADDRESS:
P.O. NUMBER:	SAMPLED BY: MK

CHAIN OF CUSTODY

PAGE 1 OF 1

TURNAROUND TIME
- ☑ APL STANDARD is 1-2 weeks
- ☐ RUSH turnaround available upon request and lab approval.

REPORT FORMAT
- ☑ STANDARD
- ☐ NJ DEP REDUCED DELIVERABLES
- ☐ NJ DEP FULL DELIVERABLES
- ☐ ELECTRONIC DATA DELIVERY SRP#
- ☐ STATE FORMS NEEDED

MATRIX ABBREVIATIONS D\DRINKING WATER, W\WASTE WATER, S\SOIL, SL\SLUDGE

APL LAB ID#	SAMPLE SOURCE \ FIELD ID 99121134	DATE	TIME	SAMPLE TYPE GRAB	SAMPLE TYPE COMP	MATRIX	# BOTTLES	PRESERVATIVE	<4°C	pH	ANALYSIS REQUESTED
001	DR1216-02	12/16	1p	✓		S	1				624/625 (NY STARS)

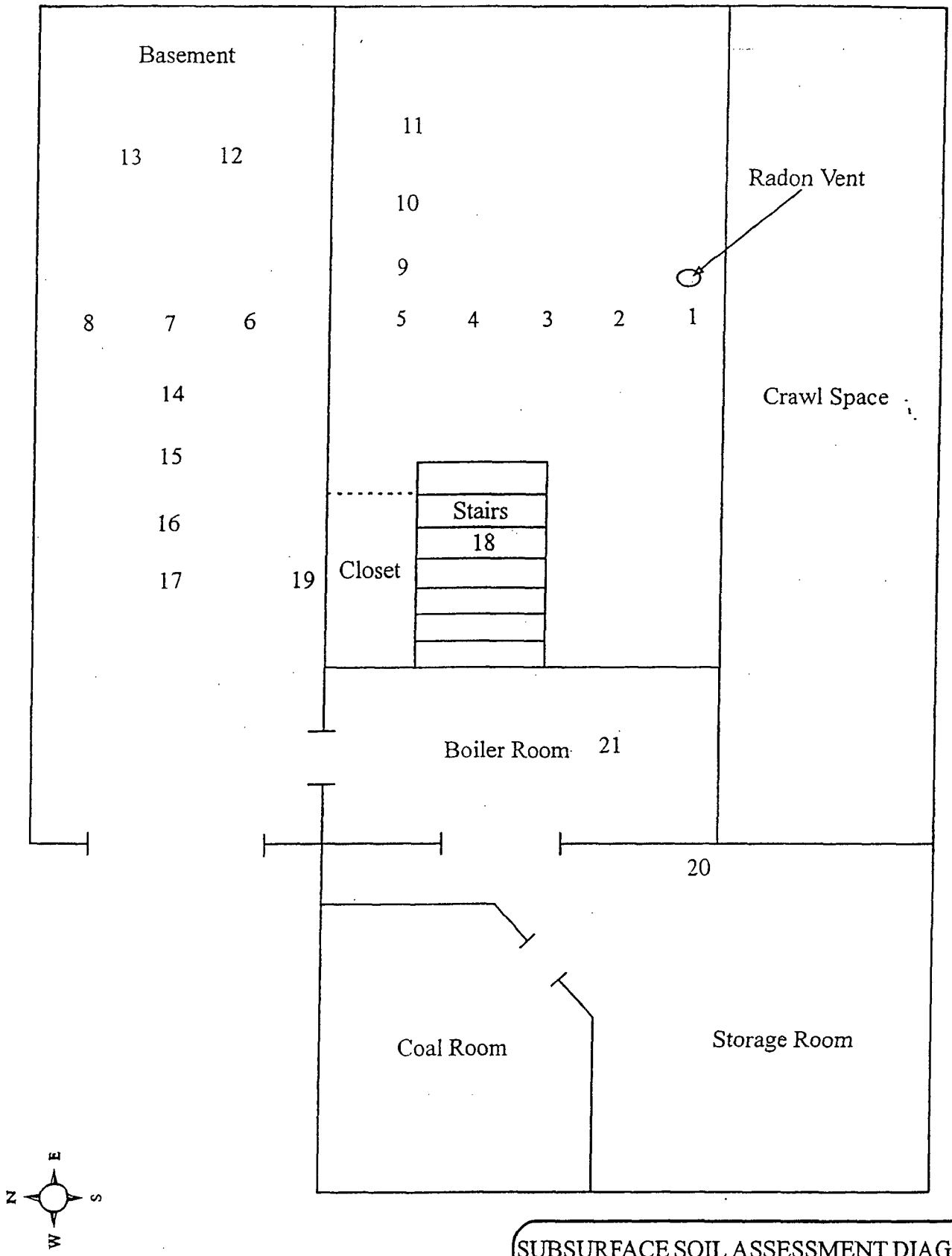
RELINQUISHED BY (Print) Mike Kennedy	DATE 12/20/99	RECEIVED BY (Print) J. Sharis	DATE 12/20/99
Signature/Agent of:	TIME 11:40 AM PM	Signature/Agent of:	TIME 11:40 AM PM
RELINQUISHED BY (Print) J. Sharis	DATE 12/20/99	RECEIVED BY (Print)	DATE 12/20/99
Signature/Agent of:	TIME 3:50 AM PM	Signature/Agent of:	TIME 3:50 AM PM
RELINQUISHED BY (Print)	DATE / /	RECEIVED BY (Print)	DATE / /
Signature/Agent of:	TIME : AM PM	Signature/Agent of:	TIME AM PM

COMMENTS/SPECIAL INSTRUCTIONS

APPENDIX F

Subsurface Soil Assessment Diagram

Dorson 45 Knollwood Road Elmsford, New York 10523 (914) 592-3117 Fax No. (914) 592-4051



SUBSURFACE SOIL ASSESSMENT DIAGRAM

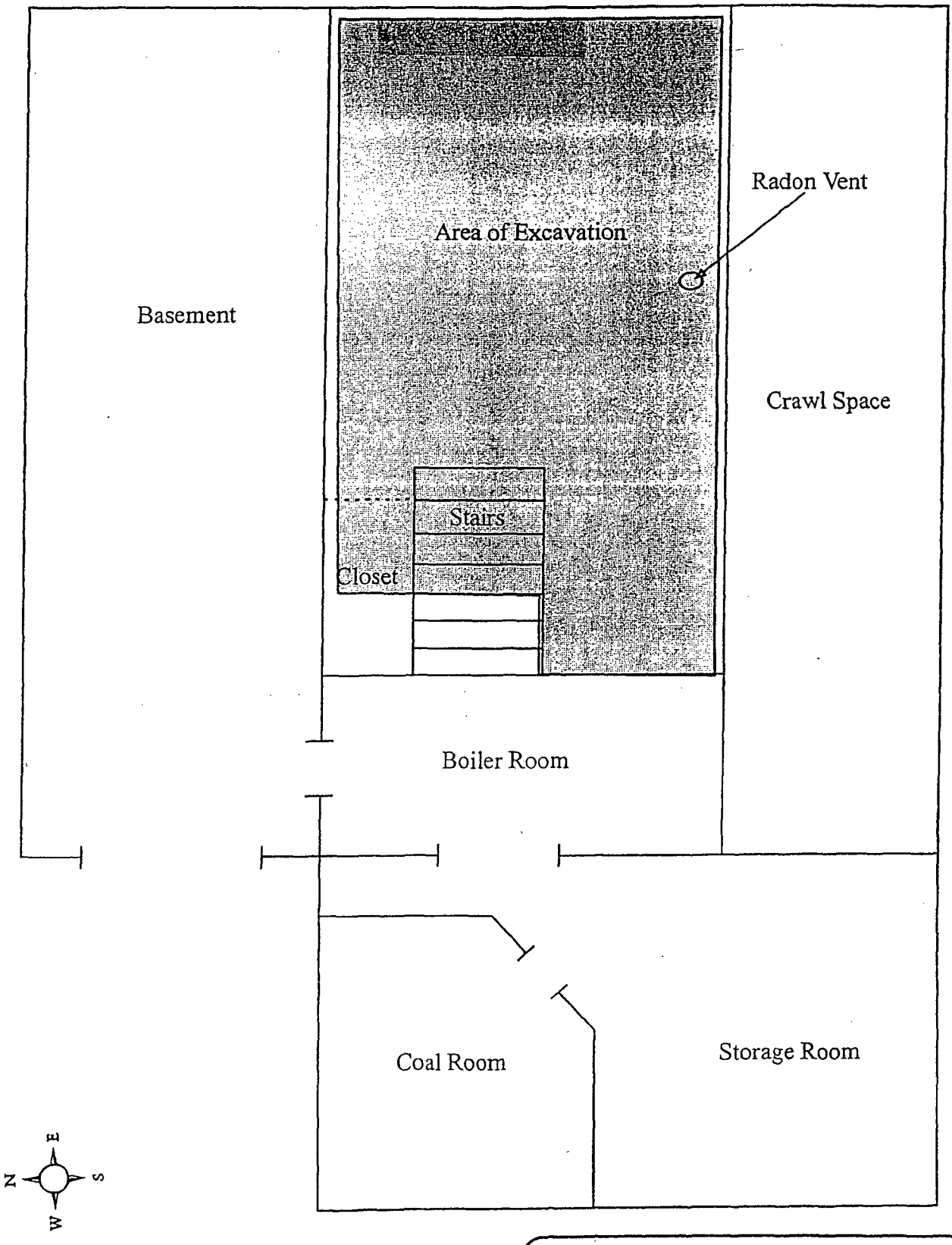
27 Old State Road
Hopewell Junction, New York

PROJ. MGR: TVG	PROJ. NO.: N/A
SCALE: 1" = 5'	FIGURE: N/A

APPENDIX G

Soil Excavation Diagram

Dorson 45 Knollwood Road Elmsford, New York 10523 (914) 592-3117 Fax No. (914) 592-4054



SOIL EXCAVATION DIAGRAM

27 Old State Road
Hopewell Junction, New York

PROJ. MGR: TVG	PROJ. NO.: N/A
SCALE: 1" = 5'	FIGURE: N/A

APPENDIX H

Soil Analytical Results for January 27 - 28 and February 1, 2000

YORK
ANALYTICAL LABORATORIES, INC.

Technical Report

prepared for

Dorson Environmental Management
45 Knollwood Rd.
Elmsford, NY 10523
Attention: Amy Fontana

Report Date: 2/3/2000
Re: Client Project ID: 27 Old State Rd.
York Project No.: 00020016

CT License No. PH-0723 New York License No. 10854 Mass. License No. M-CT106 Rhode Island License No. 93 EPA I.D. No. CT00106

ONE RESEARCH DRIVE STAMFORD, CT 06906 (203) 325-1371 FAX (203) 357-0166

Report Date: 2/3/2000
Client Project ID: 27 Old State Rd.

York Project No.: 00020016

Dorson Environmental Management
45 Knollwood Rd.
Elmsford, NY 10523
Attention: Amy Fontana

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on 02/01/00. The project was identifed as your project "27 Old State Rd. ".

The analysis was conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables .

The results of the analysis are summarized in the following table(s).

Analysis Results

Client Sample ID			East Wall Comp.		North Wall Comp.	
York Sample ID			00020016-01		00020016-02	
Matrix			SOIL		SOIL	
Parameter	Method	Units	Results	MDL	Results	MDL
Volatiles-8021 STARS soil	SW846-8260	ug/Kg	---	---	---	---
1,2,4-Trimethylbenzene			87	5.0	7	5.0
1,3,5-Trimethylbenzene			56	5.0	Not detected	5.0
Benzene			Not detected	5.0	Not detected	5.0
Ethylbenzene			Not detected	5.0	Not detected	5.0
Isopropylbenzene			Not detected	5.0	Not detected	5.0
Methyl-tert-butyl ether (MTBE)			Not detected	5.0	Not detected	5.0
Naphthalene			20	5.0	15	5.0
n-Butylbenzene			Not detected	5.0	Not detected	5.0
n-Propylbenzene			Not detected	5.0	Not detected	5.0
o-Xylene			18	10	Not detected	10
p- & m-Xylenes			10	10	Not detected	10
p-Isopropyltoluene			12	5.0	Not detected	5.0
sec-Butylbenzene			Not detected	5.0	Not detected	5.0
tert-Butylbenzene			Not detected	5.0	Not detected	5.0
Toluene			12	5.0	14	5.0
Total Xylenes			28	10	Not detected	10
Polynuclear Aromatic Hydroc.(BN)	SW846-8270	ug/kG	---	---	---	---
Acenaphthene			630	330	Not detected	330

YORK

Client Sample ID			East Wall Comp.		North Wall Comp.	
York Sample ID			00020016-01		00020016-02	
Matrix			SOIL		SOIL	
Parameter	Method	Units	Results	MDL	Results	MDL
Anthracene			Not detected	330	Not detected	[illegible]
Benzo[a]anthracene			Not detected	330	Not detected	330
Benzo[a]pyrene			Not detected	330	Not detected	330
Benzo[b]fluoranthene			Not detected	330	Not detected	330
Benzo[g,h,i]perylene			Not detected	330	Not detected	330
Benzo[k]fluoranthene			Not detected	330	Not detected	330
Chrysene			Not detected	330	Not detected	330
Dibenz[a,h]anthracene			Not detected	330	Not detected	330
Fluoranthene			Not detected	330	Not detected	330
Fluorene			1500	330	Not detected	330
Indeno[1,2,3-cd]pyrene			Not detected	330	Not detected	330
Naphthalene			1800	330	Not detected	330
Phenanthrene			2000	330	Not detected	330
Pyrene			370	330	Not detected	330

Units Key:

For Waters/Liquids: mg/L = ppm ; ug/L = ppb For Soils/Solids: mg/kg = ppm ; ug/kg = ppb

Notes:

1. The MDL (Minimum Detectable Limit) reported is adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. If dilution factor is reported at the end of the compound list, the MDL is determined by multiplying the MDL times the listed dilution factor.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.

Approved By: Robert Q. Bradley
Managing Director

Date: 2/3/2000

YORK

YORK
ANALYTICAL LABORATORIES, INC.
ONE RESEARCH DRIVE
STAMFORD, CT 06906
(203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

Company Name	Report To:	Invoice To:	Project ID/No.	
Dorson Environmental 45 Knollwood Rd Elmsford NY 10523	Dorson	Dorson	27 old State Rd. Hopewell Junction, NY	Samples Collected By (Signature): [signature] Name (Printed): Michael Kenedy

Sample No.	Location/ID	Date Sampled	Sample Matrix: Water	Soil	Air	OTHER	ANALYSES REQUESTED	Container Description(s)
	East Wall Comp.	1/27/00		✓			STARS 8021, 8270	1
	North Wall Comp	1/27/00		✓			STARS 8021, 8270	1
				✓				

Chain-of-Custody Record

Bottles Relinquished from Lab by	Date/Time	[signature] Sample Relinquished by	1/31/00 Date/Time	Sample Received by	Date/Time
Bottles Received in Field by	Date/Time	Sample Relinquished by	Date/Time	Linda A Goblan Sample Received in LAB by	2/1/00 1000 Date/Time

Comments/Special Instructions

Turn-Around Time
___ Standard ✓ RUSH(define) 3 days

YORK

ANALYTICAL LABORATORIES, INC.

Technical Report

prepared for

Dorson Environmental Management
45 Knollwood Rd.
Elmsford, NY 10523
Attention: Amy Fontana

Report Date: 2/3/2000
Re: Client Project ID: 27 Old State Rd.
York Project No.: 00010618

CT License No. PH-0723 New York License No. 10854 Mass. License No. M-CT106 Rhode Island License No. 93 EPA I.D. No. CT00106

ONE RESEARCH DRIVE STAMFORD, CT 06906 (203) 325-1371 FAX (203) 357-0166

Report Date: 2/3/2000
Client Project ID: 27 Old State Rd.

York Project No.: 00010618

Dorson Environmental Management
45 Knollwood Rd.
Elmsford, NY 10523
Attention: Amy Fontana

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on 01/31/00. The project was identifed as your project "27 Old State Rd. ".

The analysis was conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables .

The results of the analysis are summarized in the following table(s).

Analysis Results

Client Sample ID			Floor Comp.		South Comp.	
York Sample ID			00010618-01		00010618-02	
Matrix			SOIL		SOIL	
Parameter	Method	Units	Results	MDL	Results	MDL
Volatiles-8021 STARS soil	SW846-8260	ug/Kg	---	---	---	---
1,2,4-Trimethylbenzene			Not detected	5.0	740	5.0
1,3,5-Trimethylbenzene			Not detected	5.0	220	5.0
Benzene			Not detected	5.0	Not detected	5.0
Ethylbenzene			Not detected	5.0	37	5.0
Isopropylbenzene			Not detected	5.0	33	5.0
Methyl-tert-butyl ether (MTBE)			Not detected	5.0	Not detected	5.0
Naphthalene			Not detected	5.0	Not detected	5.0
n-Butylbenzene			Not detected	5.0	150	5.0
n-Propylbenzene			Not detected	5.0	65	5.0
o-Xylene			Not detected	10	230	10
p- & m-Xylenes			Not detected	10	220	10
p-Isopropyltoluene			Not detected	5.0	86	5.0
sec-Butylbenzene			Not detected	5.0	95	5.0
tert-Butylbenzene			Not detected	5.0	Not detected	5.0
Toluene			Not detected	5.0	51	5.0
Total Xylenes			Not detected	10	Not detected	10
Polynuclear Aromatic Hydroc.(BN)	SW846-8270	ug/kG	---	---	---	---
Acenaphthene			Not detected	330	4800	3300

YORK

Client Sample ID			Floor Comp.		South Comp.	
York Sample ID			00010618-01		00010618-02	
Matrix			SOIL		SOIL	
Parameter	Method	Units	Results	MDL	Results	MDL
Anthracene			Not detected	330	Not detected	3300
Benzo[a]anthracene			Not detected	330	Not detected	3300
Benzo[a]pyrene			Not detected	330	Not detected	3300
Benzo[b]fluoranthene			Not detected	330	Not detected	3300
Benzo[g,h,i]perylene			Not detected	330	Not detected	3300
Benzo[k]fluoranthene			Not detected	330	Not detected	3300
Chrysene			Not detected	330	Not detected	3300
Dibenz[a,h]anthracene			Not detected	330	Not detected	3300
Fluoranthene			Not detected	330	Not detected	3300
Fluorene			Not detected	330	8200	3300
Indeno[1,2,3-cd]pyrene			Not detected	330	Not detected	3300
Naphthalene			Not detected	330	5900	3300
Phenanthrene			Not detected	330	12000	3300
Pyrene			Not detected	330	Not detected	3300

Units Key:

For Waters/Liquids: mg/L = ppm ; ug/L = ppb For Soils/Solids: mg/kg = ppm ; ug/kg = ppb

Notes:

1. The MDL (Minimum Detectable Limit) reported is adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. If dilution factor is reported at the end of the compound list, the MDL is determined by multiplying the MDL times the listed dilution factor.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.

Approved By: Robert Q. Bradley
Managing Director

Date: 2/3/2000

YORK

YORK
ANALYTICAL LABORATORIES, INC.
ONE RESEARCH DRIVE
STAMFORD, CT 06906
(203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

00010618

Company Name	Report To:	Invoice To:	Project ID/No.	
Dorson Env. -	Dorson Env. 45 Knollwood Rd. Elmsford NY 10523	same.	27 Old State Rd. Hopewell Jctn., NY.	Samples Collected By (Signature) / Name (Printed)

Sample No.	Location/ID	Date Sampled	Sample Matrix: Water	Soil	Air	OTHER	ANALYSES REQUESTED	Container Description(s)
	Floor Comp.	1/28/00		x			STARS 8021, 8270	1
	South Comp.	1/28/00		x			STARS 8021, 8270	1
	Under Stairs	1/28/00		x			HOLD	1

Chain-of-Custody Record

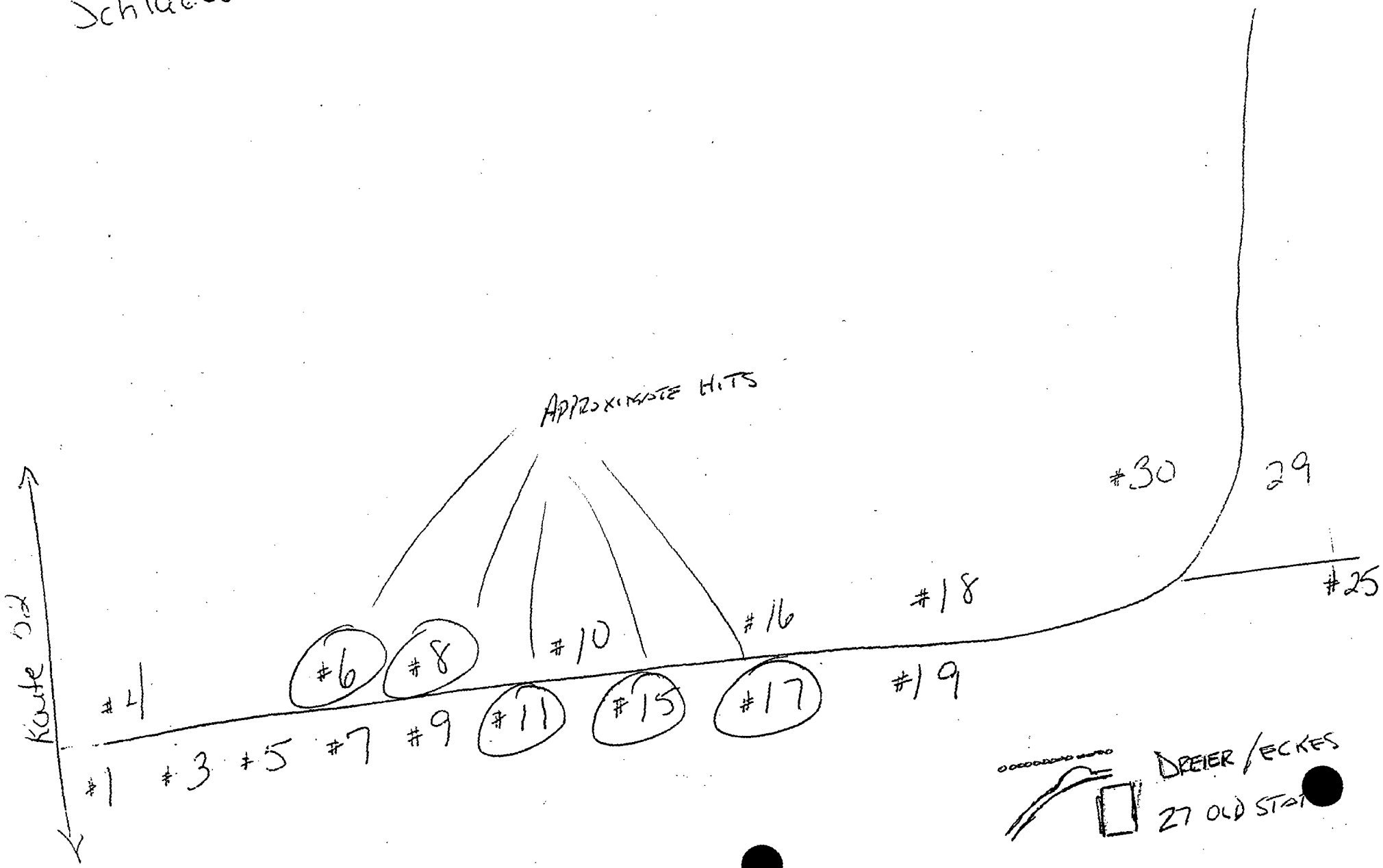
Bottles Relinquished from Lab by	Date/Time	Sample Relinquished by	Date/Time	Sample Received by	Date/Time
		Sam Gallinger	1/31/00	R. Van Deusen	1-31-00 8:35
Bottles Received in Field by	Date/Time	Sample Relinquished by	Date/Time	Sample Received in LAB by	Date/Time
				Linda A. LeBlanc	1/31/00 1130

Comments/Special Instructions

Turn-Around Time
___ Standard X RUSH(define) 3-day

Schlueter Drive, Town of East Fishkill Initial Sample Results (in ppb) March-2000										
Compound	#6	#8	#9	#10	#11	#15	#16	#17	#18	#19
Benzene	nd	nd	nd	nd	1	nd	nd	nd	nd	nd
m,p-xylene	.6	nd	nd	nd	3	nd	nd	nd	nd	nd
o-xylene	11	nd	nd	nd	5.8	4.6	nd	nd	nd	nd
sec-butylbenzene	.6	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3,5-trimethylbenzene	.5	nd	nd	nd	1	nd	nd	nd	nd	nd
4-isopropyltoluene	.6	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-trimethylbenzene	1	nd	nd	nd	2.5	nd	nd	nd	nd	nd
n-butylbenzene	1.1	nd	nd	nd	nd	nd	nd	nd	nd	nd
naphthalene	12	nd	nd	nd	4.1	5.4	nd	nd	nd	.5
MTBE	24	5.3	nd	3.2	14	13	nd	16	16	nd

Schlueter Drive



Hudson Valley Water Resources, Inc.
11 N. Ohioville Road, New Paltz, N.Y. 12561
(800)724-2430 (914)255-4050

Spill #:9935033 **Pin#01280** **Invoice #7031**

For 7/1/2001 TO 9/30/2001
Rental of Whole House Water Treatment Systems at the Following Locations:

Acct.#	Rental Terms	Amount
Hopewell Junction		
57067 DOWNS	3 mos. at $85.00/month	$255.00
57042 HALEY	3 mos. at $85.00/month	$255.00
57323 GALLERY	3 mos. at $85.00/month	$255.00
57687 MCLEOD	3 mos. at $85.00/month	$255.00

Total Rent $1020.00

ACCT	DATE	DESCRIPTION	AMOUNT
Haley 57042	4/6/01	(1) Carbon Tank Exchange	$305.00

Total Service.....$305.00

TOTAL OF INVOICE.....$1,325.00.

SEVERN TRENT SERVICES

STL Newburgh is a part of Severn Trent Laboratories, Inc.

STL Newburgh
[illegible] Fullington Avenue
Newburgh, NY 12550
Tel (845) 562-0890
Fax (845) 562-0841

Spill#9935033										9-Nov-00	Filter System		
Schlueter Rd, Dutchess County				PRE		MID		POST					
				MTBE	BTEX	MTBE	BTEX	MTBE	BTEX	Well Depth			
No.	Name	Street Address	Date Sampled	ppb	ppb	ppb	ppb	ppb	ppb	Comments	Installed	Yes/No	Lab No.
1	Margo	6 Schlueter	2/10/00 0:00	5.3	0								
	Margo	6 Schlueter	3/27/00 0:00	0	0								212920
	Margo	6 Schlueter	4/20/00 0:00	0	0								214417
	Margo	6 Schlueter	6/24/00 0:00	0	0								215359
	Margo	6 Schlueter	7/28/00 0:00	0	0								217722
	Margo	6 Schlueter	10/9/00 0:00	0	0								219058
													221660
2	Gardineer	8 Schlueter	2/23/00 0:00	4.5	0								
	Gardineer	8 Schlueter	4/20/00 0:00	3.9	0								213293
	Gardineer	8 Schlueter	6/5/00 0:00	0	0								215359
	Gardineer	8 Schlueter	7/28/00 0:00	0	0								216795
	Gardineer	8 Schlueter	10/9/00 0:00	0	0								219057
													221660
3	Emmanvelle	9 Schlueter	5/4/00 0:00	0	0								
	Emmanvelle	9 Schlueter	6/5/00 0:00	0	0								215758
	Emmanvelle	9 Schlueter	6/24/00 0:00	0	0								216795
	Emmanvelle	9 Schlueter	7/28/00 0:00	0	0								217722
	Emmanvelle	9 Schlueter	10/9/00 0:00	0	0								219056
													221660
4	Hertel	10 Schlueter	3/15/00 0:00	8.7	0								
	Hertel	10 Schlueter	4/20/00 0:00	5.2	0								214027
	Hertel	10 Schlueter	6/5/00 0:00	2	0								215359
	Hertel	10 Schlueter	7/28/00 0:00	0	0								216795
	Hertel	10 Schlueter	10/9/00 0:00	0	0								219066
													221660
5	Gallery	11 Schlueter	2/23/00 0:00	11	7.3	0	0	2.3	0				
	Gallery	11 Schlueter	3/27/00 0:00	13	3.4	0	0	0	0				213295
	Gallery	11 Schlueter	6/5/00 0:00										214414
	Gallery	11 Schlueter	7/12/00 0:00	3.7	2.3	5.4	9.3	0	0				216794
													219060

SEVERN TRENT SERVICES
STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 562-0800
Fax (845) 562-0841

6	Downs	15 Schlueter	2/23/00 0:00	0	1.9								213293
	Downs	15 Schlueter	3/15/00 0:00	0	0								214027
	Downs	15 Schlueter	6/5/00 0:00	2.4	3.8	0	0	0	0				216793
	Downs	15 Schlueter	7/28/00 0:00	1.2	2.2	0	0	0	0				219063
	Downs	15 Schlueter	10/9/00 0:00	5.4	9.3	0	0	0	0				221657
7	Stephen's	16 Schlueter	3/1/00 0:00	0	0								213514
	Stephen's	16 Schlueter	6/5/00 0:00	0	0								216795
	Stephen's	16 Schlueter	6/24/00 0:00	0	0								217722
	Stephen's	16 Schlueter	7/28/00 0:00	0	0								219062
	Stephen's	16 Schlueter	10/9/00 0:00	0	0								221660
8	Halay	17 Schlueter	3/27/00 0:00	18	0	0	0	0	0				214416
	Halay	17 Schlueter	6/5/00 0:00	2.1	0	0	0	0	0				216792
	Halay	17 Schlueter	7/28/00 0:00	0	0	0	0	0	0				219103
	Halay	17 Schlueter	10/9/00 0:00	2.1	0	0	0	0	0				221658
9	Mcleod	19 Schlueter	3/15/00 0:00	15	0								214027
	Mcleod	19 Schlueter	3/27/00 0:00	8.4	0								214418
	Mcleod	19 Schlueter	4/20/00 0:00	0	0								215359
	Mcleod	19 Schlueter	6/5/00 0:00	1	0	0	0	0	0				216791
	Mcleod	19 Schlueter	8/17/00 0:00	0	0	0	0	0	0				219827
10	Ricotta	25 Schlueter	2/29/00 0:00	0	0								213471
	Ricotta	25 Schlueter	4/20/00 0:00	0	0								215359
	Ricotta	25 Schlueter	7/28/00 0:00	0	0								219065

Schlueter Road
Lab: STL
spill # 99-35033

Site Name	Sample Date	MTBE ppb	BTEX ppb	Naphtha
#1 Teller	03/01/00	ND	ND	ND
	04/20/00	ND	ND	ND
	06/24/00	ND	ND	ND
#3 Pinnkowski	04/20/00	ND	ND	ND
	06/24/00	ND	ND	ND
#4 Colontonio	03/01/00	ND	ND	ND
	05/04/00	ND	ND	ND
	06/24/00	ND	ND	ND
#5 - Otto	04/20/00	ND	ND	ND
	03/01/00	ND	ND	ND
	06/24/00	ND	ND	ND
#6 Margo	02/23/00	ND	ND	ND
	02/29/00	ND	ND	ND
	04/20/00	24	15	12
	06/24/00	ND	ND	ND
	07/28/00	ND	ND	ND
#7 Sealy	03/01/00	ND	ND	ND
	05/04/00	ND	ND	ND
	06/24/00	ND	ND	ND
#8 - Gardiner	02/10/00	5.3	ND	ND
	02/23/00	4.5	ND	ND
	03/01/00	ND	ND	ND
	04/20/00	3.9	ND	ND
	06/24/00	ND	ND	ND
	07/28/00	ND	ND	ND
#9 Emanuele	02/10/00	ND	ND	ND
well depth 120'	02/29/00	ND	ND	ND
	05/04/00	ND	ND	ND
	06/24/00	ND	ND	ND
	07/28/00	ND	ND	ND

Schlueter Road
Lab: STL
spill # 99-35033

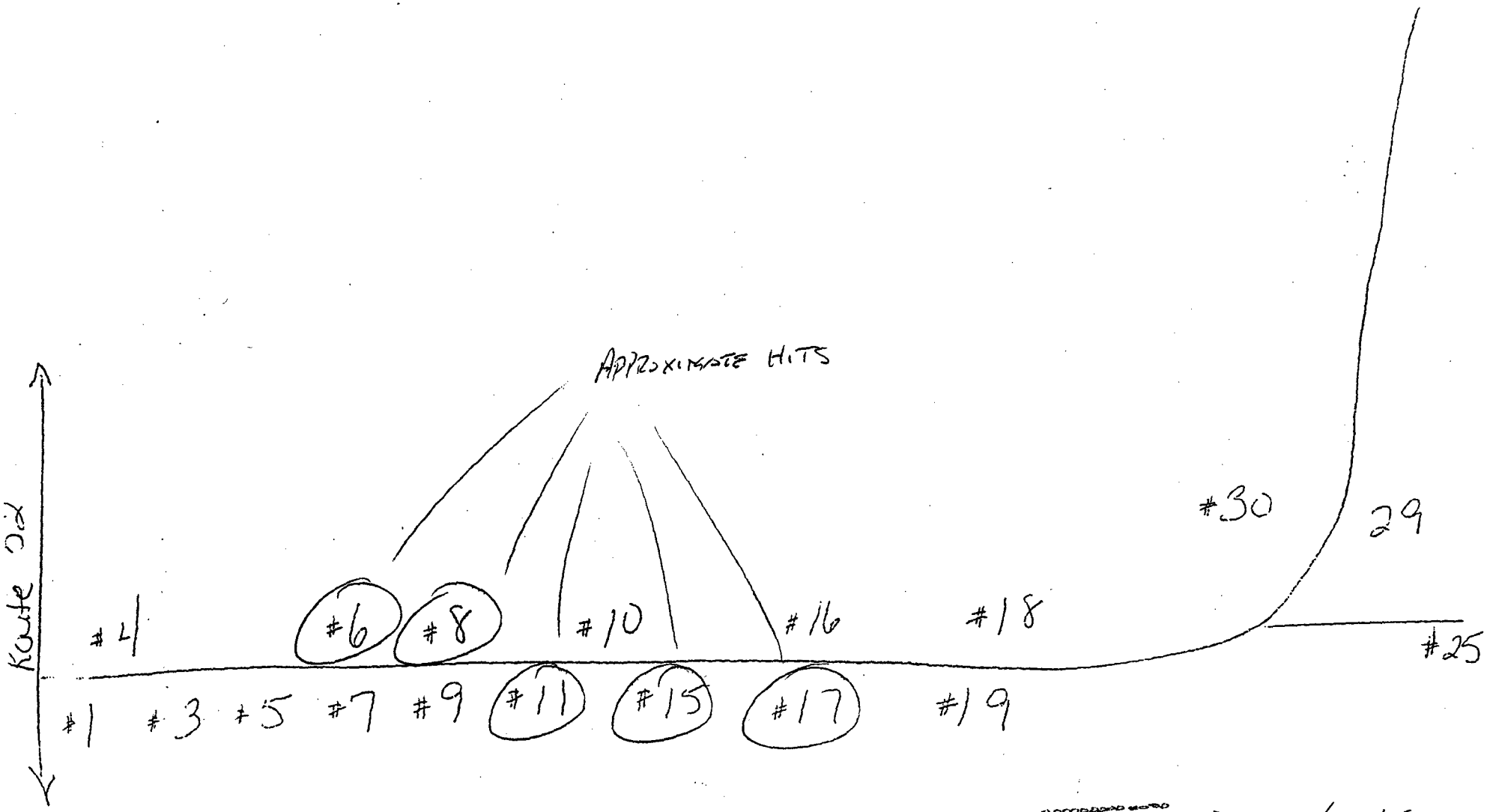
Site Name	Sample Date	MTBE ppb	BTEX ppb	Naphtha
#10 Hertel	02/10/00	3.2	ND	ND
	02/23/00	ND	ND	ND
	03/15/00	8.7	ND	ND
	04/20/00	5.2	ND	ND
	06/05/00	2	ND	ND
	07/28/00	ND	ND	ND
#11 Gallery - FILTER well depth 242'	02/11/00	14	13	4.1
	02/23/00	11	ND	1.2
	03/27/00	13+		
	04/20/00	11	ND	1.2
	06/05/00	3.9	3	2.7
#15 Downs - FILTER	02/11/00	13	4.6	5.4
	02/23/00	ND	1.9	ND
	03/15/00	ND	ND	ND
	03/27/00	9.8+		
	04/20/00	7.7	9	11
#16 - Stephens well depth 330'	02/11/00	ND	ND	ND
	03/01/00	ND	ND	ND
	04/27/00	ND	ND	ND
	06/24/00	ND	ND	ND
	07/28/00	ND	ND	ND
#17 Halay - FILTER	02/10/00	16	ND	ND
	04/20/00	11	ND	ND
	06/05/00	2.1	ND	ND
#18 Saporite well depth 180'	02/23/00	ND	ND	ND
	03/01/00	16	ND	ND
	05/04/00	ND	ND	ND
	06/24/00	ND	ND	ND

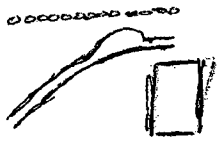
Schlueter Road
Lab: STL
spill # 99-35033

Site Name	Sampling Date	Raw Water MTBE ppb	BTEX ppb	Naphtha
#19 Mcleod -FILTER	02/23/00	ND	ND	0.5
well depth 200'	02/29/00	18	ND	ND
	03/15/00	15	ND	ND
	04/20/00	3.1	ND	ND
	06/05/00	1	ND	ND
#25 Ricotta	02/29/00	ND	ND	ND
well depth 200'	04/20/00	ND	ND	ND
	06/24/00	ND	ND	ND
	07/28/00	ND	ND	ND
#29 Rango	02/29/00	ND	ND	ND
	04/20/00	ND	ND	ND
	06/24/00	ND	ND	ND
#30 - Ackley	03/01/00	ND	ND	ND
	04/20/00	ND	ND	ND
	06/24/00	ND	ND	ND

The remainder of the homes on this road were sampled on June 24, 2000 and there were no impacts.

Schlueter Drive





DREIER / ECKES
27 OLD STATE

YORK
ANALYTICAL LABORATORIES, INC.

Technical Report

prepared for

Hudson Valley Water Resources
11 North Ohioville Road
New Paltz, NY 12561
Attention: Ms. Trinity Chapman

Report Date: 9/24/2001
Re: Client Project ID: 27 Old State
York Project No.: 01090354

CT License No. PH-0723 New York License No. 10854 Mass. License No. M-CT106 Rhode Island License No. 93 EPA I.D. No. CT00106

nelac nelap

ONE REBEARCH DRIVE STAMFORD, CT 06906 (203) 325-1371 FAX (203) 357-0166

Eckes

Report Date: 9/24/2001
Client Project ID: 27 Old State
York Project No.: 01090354

Hudson Valley Water Resources
11 North Ohioville Road
New Paltz, NY 12561
Attention: Ms. Trinity Chapman

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on 09/18/01. The project was identified as your project "27 Old State ".

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables .

All samples were received in proper condition meeting the NELAC acceptance requirements for environmental samples except those indicated under the Notes section of this report.

All the analyses met the method and laboratory standard operating procedure requirements except as indicated under the Notes section of this report, or as indicated by any data flags, the meaning of which is explained in the attachment to this report, if applicable.

The results of the analyses, which are all reported on an as-received basis unless otherwise noted, are summarized in the following table(s).

Analysis Results

Client Sample ID			A Raw		B After 1st Tank	
York Sample ID			01090354-01		01090354-02	
Matrix			WATER		WATER	
Parameter	Method	Units	Results	MDL	Results	MDL
Volatiles 502.2 List water	EPA 502.2	ug/L	---	---	---	---
1,1,1,2-Tetrachloroethane			Not detected	0.5	Not detected	0.5
1,1,1-Trichloroethane			Not detected	0.5	Not detected	0.5
1,1,2,2-Tetrachloroethane			Not detected	0.5	Not detected	0.5
1,1,2-Trichloroethane			Not detected	0.5	Not detected	0.5
1,1-Dichloroethane			Not detected	0.5	Not detected	0.5
1,1-Dichloroethylene			Not detected	0.5	Not detected	0.5
1,1-Dichloropropylene			Not detected	0.5	Not detected	0.5
1,2,3-Trichlorobenzene			Not detected	0.5	Not detected	0.5
1,2,3-Trichloropropane			Not detected	0.5	Not detected	0.5
1,2,3-Trimethylbenzene			Not detected	0.5	Not detected	0.5
1,2,4-Trichlorobenzene			Not detected	0.5	Not detected	0.5
1,2,4-Trimethylbenzene			Not detected	0.5	Not detected	0.5
1,2-Dibromo-3-chloropropane			Not detected	0.5	Not detected	0.5
1,2-Dibromoethane			Not detected	0.5	Not detected	0.5
1,2-Dichlorobenzene			Not detected	0.5	Not detected	0.5
1,2-Dichloroethane			Not detected	0.5	Not detected	0.5

YORK

Client Sample ID			A Raw		B After 1st Tank	
York Sample ID			01090354-01		01090354-02	
Matrix			WATER		WATER	
Parameter	Method	Units	Results	MDL	Results	MDL
1,2-Dichloroethylene (Total)			Not detected	0.5	Not detected	0.5
1,2-Dichloropropane			Not detected	0.5	Not detected	0.5
1,3,5-Trimethylbenzene			Not detected	0.5	Not detected	0.5
1,3-Dichlorobenzene			Not detected	0.5	Not detected	0.5
1,3-Dichloropropane			Not detected	0.5	Not detected	0.5
1,3-Dichloropropylene			Not detected	0.5	Not detected	0.5
1,4-Dichlorobenzene			Not detected	0.5	Not detected	0.5
2,2-Dichloropropane			Not detected	0.5	Not detected	0.5
2-Chlorotoluene			Not detected	0.5	Not detected	0.5
4-Chlorotoluene			Not detected	0.5	Not detected	0.5
Benzene			Not detected	0.5	Not detected	0.5
Bromobenzene			Not detected	0.5	Not detected	0.5
Bromochloromethane			Not detected	0.5	Not detected	0.5
Bromodichloromethane			Not detected	0.5	Not detected	0.5
Bromoform			Not detected	0.5	Not detected	0.5
Bromomethane			Not detected	0.5	Not detected	0.5
Carbon tetrachloride			Not detected	0.5	Not detected	0.5
Chlorobenzene			Not detected	0.5	Not detected	0.5
Chloroethane			Not detected	0.5	Not detected	0.5
Chloroform			Not detected	0.5	Not detected	0.5
Chloromethane			Not detected	0.5	Not detected	0.5
Dibromochloromethane			Not detected	0.5	Not detected	0.5
Dibromomethane			Not detected	0.5	Not detected	0.5
Dichlorodifluoromethane			Not detected	0.5	Not detected	0.5
Ethylbenzene			Not detected	0.5	Not detected	0.5
Hexachlorobutadiene			Not detected	0.5	Not detected	0.5
Isopropylbenzene			Not detected	0.5	Not detected	0.5
Methylene chloride			Not detected	0.5	Not detected	0.5
MTBE			Not detected	1.0	Not detected	1.0
Naphthalene			Not detected	0.5	Not detected	0.5
n-Butylbenzene			Not detected	0.5	Not detected	0.5
n-Propylbenzene			Not detected	0.5	Not detected	0.5
o-Xylene			Not detected	0.5	Not detected	0.5
p- & m-Xylenes			Not detected	0.5	Not detected	0.5
p-Isopropyltoluene			Not detected	0.5	Not detected	0.5
sec-Butylbenzene			Not detected	0.5	Not detected	0.5
Styrene			Not detected	0.5	Not detected	0.5
tert-Butylbenzene			Not detected	0.5	Not detected	0.5
Tetrachloroethylene			Not detected	0.5	Not detected	0.5
Toluene			Not detected	0.5	Not detected	0.5
Trichloroethylene			Not detected	0.5	Not detected	0.5
Trichlorofluoromethane			Not detected	0.5	Not detected	0.5
Vinyl chloride			Not detected	0.5	Not detected	0.5

YORK

Client Sample ID			C After 2nd Tank	
York Sample ID			01090354-03	
Matrix			WATER	
Parameter	Method	Units	Results	MDL
Volatiles 502.2 List water	EPA 502.2	ug/L	---	---
1,1,1,2-Tetrachloroethane			Not detected	0.5
1,1,1-Trichloroethane			Not detected	0.5
1,1,2,2-Tetrachloroethane			Not detected	0.5
1,1,2-Trichloroethane			Not detected	0.5
1,1-Dichloroethane			Not detected	0.5
1,1-Dichloroethylene			Not detected	0.5
1,1-Dichloropropylene			Not detected	0.5
1,2,3-Trichlorobenzene			Not detected	0.5
1,2,3-Trichloropropane			Not detected	0.5
1,2,3-Trimethylbenzene			Not detected	0.5
1,2,4-Trichlorobenzene			Not detected	0.5
1,2,4-Trimethylbenzene			Not detected	0.5
1,2-Dibromo-3-chloropropane			Not detected	0.5
1,2-Dibromoethane			Not detected	0.5
1,2-Dichlorobenzene			Not detected	0.5
1,2-Dichloroethane			Not detected	0.5
1,2-Dichloroethylene (Total)			Not detected	0.5
1,2-Dichloropropane			Not detected	0.5
1,3,5-Trimethylbenzene			Not detected	0.5
1,3-Dichlorobenzene			Not detected	0.5
1,3-Dichloropropane			Not detected	0.5
1,3-Dichloropropylene			Not detected	0.5
1,4-Dichlorobenzene			Not detected	0.5
2,2-Dichloropropane			Not detected	0.5
2-Chlorotoluene			Not detected	0.5
4-Chlorotoluene			Not detected	0.5
Benzene			Not detected	0.5
Bromobenzene			Not detected	0.5
Bromochloromethane			Not detected	0.5
Bromodichloromethane			Not detected	0.5
Bromoform			Not detected	0.5
Bromomethane			Not detected	0.5
Carbon tetrachloride			Not detected	0.5
Chlorobenzene			Not detected	0.5
Chloroethane			Not detected	0.5
Chloroform			Not detected	0.5
Chloromethane			Not detected	0.5
Dibromochloromethane			Not detected	0.5
Dibromomethane			Not detected	0.5
Dichlorodifluoromethane			Not detected	0.5
Ethylbenzene			Not detected	0.5
Hexachlorobutadiene			Not detected	0.5
Isopropylbenzene			Not detected	0.5
Methylene chloride			Not detected	0.5
MTBE			Not detected	1.0
Naphthalene			Not detected	0.5
n-Butylbenzene			Not detected	0.5
n-Propylbenzene			Not detected	0.5
o-Xylene			Not detected	0.5

YORK

Client Sample ID			C After 2nd Tank	
York Sample ID			01090354-03	
Matrix			WATER	
Parameter	Method	Units	Results	MDL
p & m Xylenes			Not detected	0.5
p-Isopropyltoluene			Not detected	0.5
sec-Butylbenzene			Not detected	0.5
Styrene			Not detected	0.5
tert-Butylbenzene			Not detected	0.5
Tetrachloroethylene			Not detected	0.5
Toluene			Not detected	0.5
Trichloroethylene			Not detected	0.5
Trichlorofluoromethane			Not detected	0.5
Vinyl chloride			Not detected	0.5

Units Key: For Waters/Liquids: mg/L = ppm ; ug/L = ppb For Soils/Solids: mg/kg = ppm ; ug/kg = ppb

Notes for York Project No. 01090354

1. The MDL (Minimum Detectable Limit) reported is adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All samples were received in proper condition for analysis with proper documentation.
6. All analyses conducted met method or Laboratory SOP requirements.
7. It is noted that no analyses reported herein were subcontracted to another laboratory.

Approved By: Robert Q. Bradley
Robert Q. Bradley
Managing Director

Date: 9/24/2001

YORK

H2M GROUP

ACEC MEMBER
SUPPORTING EXCELLENCE
IN ENGINEERING

Holzmacher, McLendon & Murrell, P.C. ◣ H2M Associates, Inc.
H2M Labs, Inc. ◣ H2M Construction Management, Inc.
575 Broad Hollow Road, Melville, New York 11747
(631) 756-8000, Fax: (631) 694-4122
e-mail: h2m@h2m.com
web: www.h2m.com

August 29, 2000

Ms. Belinda Stevenson
C.N.A. Insurance
c/o Allstate Insurance Company
51 West Higgins Road
South Barrington, Il 60010

RECEIVED
NOV 30 2000
NYS-DEC
REGION 3-NEW PALTZ

Re: 27 Old State Road
Hopewell Junction, N.Y.
NYSDEC Spill No.: 99-08092 & 99-35033
Claim No.: 6EV003023
H2M Project No.: CNAI 00-01

Dear Ms. Stevenson:

As you are aware, Holzmacher, McLendon & Murrell, P.C. (H2M) has been providing fuel oil consulting services at 27 Old State Road ("the site" or the "insured's property"). Specifically, H2M has performed a subsurface investigation to assess claims that a fuel oil spill at the insured's property has impacted groundwater and seven (7) residential drinking water wells on Schleuter Drive.

1.0 – SITE DESCRIPTION

The site consists of one (1) residential dwelling, one (1) two car garage, a commercial art studio, and a guest cottage. The property is accessed by a long driveway from Old State Road that ascends from Old State Road to the south. According to the current property owner, the underground fuel storage tank (UST) in question is the only tank on the property.

The site topography has been classified as uneven, with some flat areas that have been improved by excavation and some natural slopes. Overall, the topography slopes downward toward the north and west, with a large drop-off or rock ledge defining the western perimeter.

Several of the impacted properties on Schleuter Drive are adjacent to the site and lie to the east, topographically up-gradient.

A Site Location Map and a United State Geological Survey Map are attached for your review.

2.0 – WORK PERFORMED

Work was performed in general conformance to the scope of work submitted to you in my May 24, 2000 correspondence, and in my June 1, 2000 letter to the New York State Department of Environmental Conservation (NYSDEC). Work at the site was conducted during the period of June 5, 2000 through June 27, 2000.

Deviations from the scope of work were recorded and reported to the NYSDEC. Notable deviations include the inability to collect rock cores from MW-1 and MW-3, and the final location of MW-3.

2.1 – MONITORING WELLS

Three (3) monitoring wells were installed at the site to an approximate depth of 100′ below grade surface (b.g.s.). Because of the geology at the site (bedrock), the monitoring wells were installed by a combination of drilling methods, rock coring and air rotary. Initially rock cores were to be collected continuously from 20′ b.g.s to the end of each boring. Because of the amount of fluids being lost in the fractures the bedrock, rock coring could not be accomplished in an efficient manner.

Eight (8) 5′ rock cores (i.e. a 40′ continuous rock core sample) were collected from MW-2. The bedrock was classified as being dolostone ($CaMg(CO_3)_2$, with traces of precipitated quartz, and mica. The site was identified on the Geologic Map of New York: Lower Hudson Sheet, r1995, and was described to contain limestone and dolostone. H2M utilized hydrochloric acid to conclusively determine whether the rock core samples consisted of either limestone and dolostone. Because of the presence of magnesium, dolostone effervesces very slowly or not at all, where limestone $Ca(HCO_3)_2$ effervesces freely in the presence of hydrochloric acid. The results of our assessment indicated that the rock consisted mainly of dolostone.

The rock cores indicated fractured bedrock for the interval examined. Most of the fractures were highly weathered and contained cobbles and erosional debris. Presence of these cobbles indicates high exposure to water, which over time contributes to the weathering and erosional processes.

Further confirming the amount of fractures in the formation was our attempt to use traditional rock coring methods at MW-1. Over 400 gallons of water and drilling fluid were pumped into the first 12′ of MW-1, resulting in the inability to maintain a hydraulic head on the borehole. An environmental drilling fluid was utilized to seal fractures and aid in the coring process. The contractor pumped an additional 800 gallons into the borehole with similar results. Based upon these drilling conditions, H2M elected to complete MW-1 utilizing air rotary drilling methods.

Each of the boreholes was completed to approximately 103' b.g.s. Two of the boreholes, MW-1 and MW-3, are 4" in diameter, and MW-2 is 3" in diameter. Water was identified at approximately 80' b.g.s. A total of 13 days were utilized to install the three monitoring wells, seven days beyond the expected schedule.

2.2 – MONITORING WELL SURVEYING

Casing and groundwater elevations were measured on June 27, 2000. A relative datum of 100' was assigned to MW-1 and utilized to calculate relative elevations. Once the casing elevation was determined, depth to groundwater was measured and utilized to calculate groundwater elevation.

2.3 – GROUNDWATER SAMPLING

Groundwater sampling of the site monitoring wells occurred on June 27, 2000. Each well was purged an estimated three standing well volumes prior to sample collection via dedicated teflon bailer. Also prior to sample collection, field parameters including temperature, conductivity, and pH were measured. Groundwater sampling record sheets are attached for your review.

Samples were also collected via dedicated bailer and were containerized in appropriate laboratory supplied glassware. Upon collection, samples were placed in a cooler with ice, to maintain temperature, and transported to H2M Labs Inc. for analysis by EPA methods 8021 and 8270 for dissolved volatile and semi-volatile organic compounds plus methyl tert-butyl ether (MTBE).

2.4 – PRODUCT SAMPLING AND BAILING

On June 9, 2000, H2M collected a sample of the fuel oil layer that was present in the residential drinking water well (RDW-1) located at the site. The purpose of the sample was to analyze the petroleum product for petroleum identification and the presence of MTBE.

In addition on June 9, 2000, H2M personnel measured 0.33' of product in RDW-1. H2M continued bailing free product until a layer of 0.04' was measured.

3.0 – INVESTIGATION RESULTS

3.1 – MONITORING WELL INSTALLATION

No visual signs of oil impact were observed in any of the rock cores or rock dust generated during the installation of monitoring wells.

H2M measured fluid levels in each of the wells with an oil/water interface probe. No free product or oil sheen was detected in any of the monitoring wells at the time work was conducted.

3.2 – SURVEYING RESULTS AND GROUNDWATER FLOW DIRECTION

The following table summarizes casing and groundwater elevations as of June 27, 2000.

Surveying Data and Groundwater Elevations as of June 27, 2000

Monitoring Well	Casing Elevation	Depth to G.W.	G.W. Elevation
MW-1	100.00	76.94	23.06
MW-2	103.29	80.22	23.07
MW-3	106.24	78.12	28.12

-All data presented in feet

In certain geologic formations groundwater elevations can be utilized to determine the flow direction and slope of groundwater. For the data collected on June 27, 2000, groundwater flow direction was calculated to be toward the northwest.

Because of the geologic formation at the site, it is the opinion of H2M that this data can not be utilized to confirm site specific groundwater flow direction. Although bedrock was observed to contain a large amount of fractures, H2M can not conclusively determine that the monitoring wells are hydraulically connected.

3.3 – DISSOLVED GROUNDWATER SAMPLING RESULTS

All groundwater samples were non-detect for all compounds analyzed with one exception. MTBE was identified at a concentration of 11 μg/ℓ in MW-2.

MTBE is a blending component of gasoline that is added to satisfy the Oxygenated Fuel and Reformulated Gas Program for cleaner air emissions. It has been used as a gasoline additive since 1979, and typically is not found in fuel oil. However, MTBE does find its way into fuel oil through piping and transport vehicles that carry both petroleum products to the consumer.

It should also be noted that MTBE is highly soluble in water and can be identified great distances from its point of release to the environment. It should also be noted that MTBE is usually the leading edge of a petroleum plume due to it's solubility. Because the concentrations detected at the site are low, 11 μg/ℓ, and we have a confirmed fuel oil release at the site, it is difficult to use MTBE as a tracer.

3.4 – PRODUCT SAMPLING RESULTS

Results of the analysis on the product sample collected from the residential drinking water well at the site confirmed that the product was fuel oil.

Results of the MTBE analysis on the fuel oil sample were inconclusive. The results of the analysis indicated a concentration less than 5,000 μg/kg. Due to the sample being pure product, an accurate concentration of MTBE cannot be determined utilizing the methods and the dilution required for the identification analysis.

4.0 – CONCLUSIONS

Based on the information gathered at the site to date, the following conclusions can be made:

- Fuel oil has impacted groundwater at 27 Old State Road, as found in the residential drinking water well. It is the opinion of H2M that the fuel oil source originated from the spill at 27 Old State Road during the summer of 1999.
- MTBE has been detected in groundwater at 27 Old State Road, as found in MW-2 adjacent to the residential drinking water well. The MTBE may have originated at a source other than the fuel oil leak at 27 Old State Road. The NYSDEC has informed H2M that the seven (7) residential wells impacted to the east of site contain other dissolved constituents in addition to MTBE. To date, the only dissolved constituent found in the new site wells in MTBE.
- Groundwater flow direction can not be conclusively determined based upon the geologic conditions present at the site.
- Bedrock is highly fractured and homogenous.
- Further investigation will be required to determine if the oil spill at the site impacted residential drinking water wells on Schleuter Drive.
- Additional investigation will be required to confirm the source of MTBE contamination identified on site.

5.0 – RECOMMENDATIONS

Additional work is going to be required to bring the site into compliance with the NYSDEC.

5.1 – FREE PRODUCT RECOVERY

At a minimum, C.N.A must initiate a product removal program to begin recovering fuel oil from RDW-1.

Product recovery from RDW-1 in its current state is going to be difficult. RDW-1 contains a submersible pump with associated piping and wiring. Additionally the well construction is unknown and H2M has assumed that the well consists of an uncased open borehole which may have partially collapsed sections. Work at the site has resulted in the loss of 3/8" diameter water level probe and one teflon bailer down the hole.

Because of the potential to lose further equipment down hole, H2M recommends taking RDW-1 out of service as a drinking water well and utilize it as a point of free product recovery. Prior to taking RDW-1 out of service, additional means of drinking water to the residence must be completed (i.e., new well, public service, etc.).

5.2 – FURTHER GROUNDWATER INVESTIGATION

Because groundwater flow direction could not be determined at the site and MTBE was identified in MW-2, additional investigation may be required by NYSDEC. Additional spill sources may have contributed to the contamination identified on Schleuter Drive as well as the MTBE contamination to MW-2 at the insured property.

Three additional sources that could potentially have impacted the wells on Schleuter Drive and MW-2 on the insureds property are the I.B.M. East Fishkill, N.Y. facility located on Lime Kiln Road, a retail gasoline station located on Route 52 in East Fishkill, N.Y., and unknown gasoline storage tanks operated by private residences in the area, if any.

Before installing any additional soil borings or monitoring wells, H2M recommends conducting a paper search to obtain information that can be used to determine local and regional groundwater flow, as well as any information regarding spills or releases to groundwater in the area. By submitting a freedom of information law (FOIL) request to the NYSDEC, H2M can secure information regarding open NYSDEC spill numbers that surround the site. Because the I.B.M. facility is in close proximity to the site, and the facility monitoring well network is so large, H2M is confident that I.B.M. has a good understanding of local and regional groundwater flow conditions.

If, after searching the NYSDEC records, H2M and the NYSDEC are not confident with the results, H2M will propose additional field investigation.

H2M GROUP

If you have any questions regarding this information or require anything additional, please do not hesitate to contact me directly at my office (631) 756-8000, extension 1412.

Very truly yours,

HOLZMACHER, McLENDON & MURRELL, P.C.

Michael N. Gentils, C.G.W.P.
Section Supervisor

MNG:slj

cc: File

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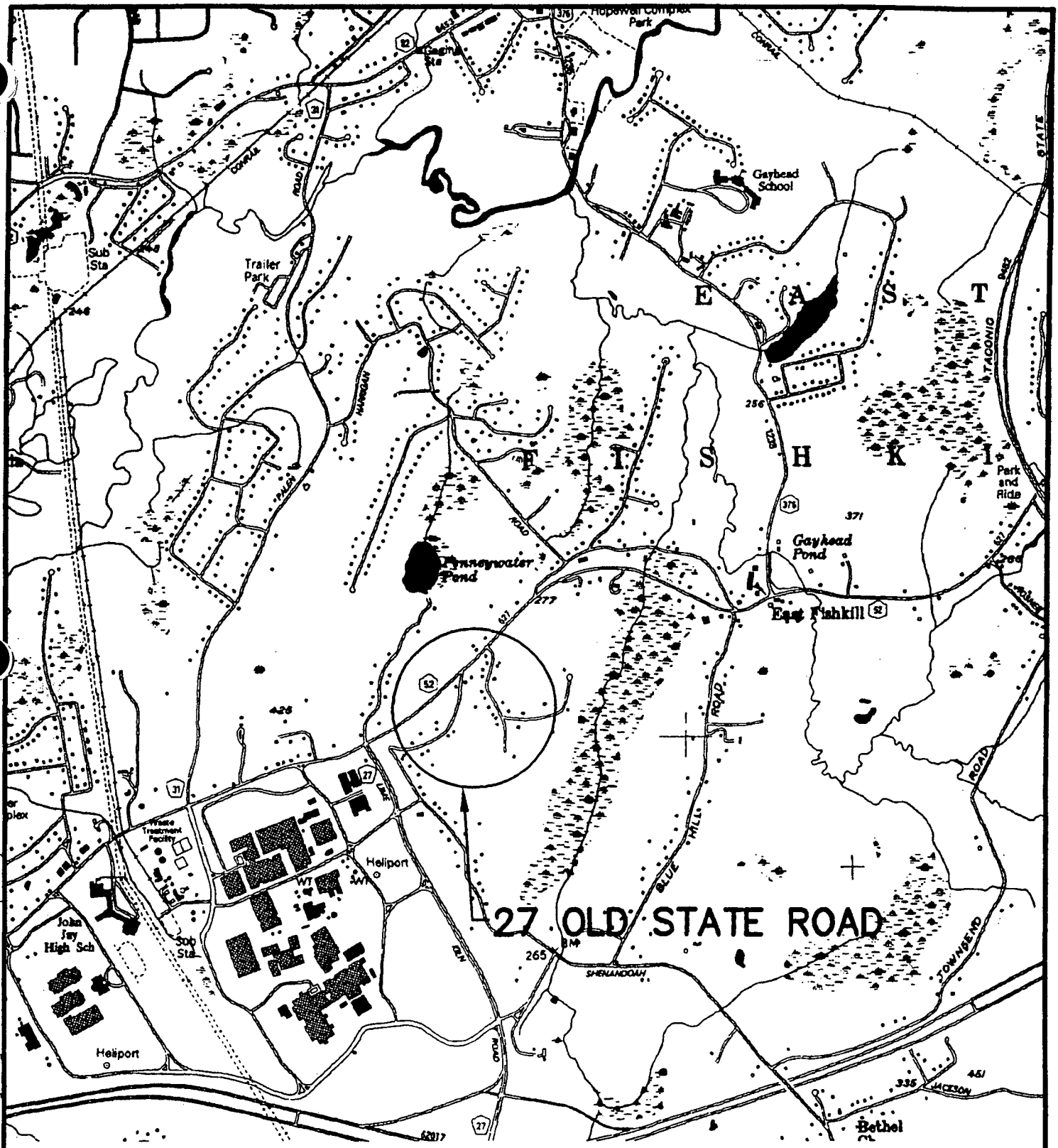
Figure 1. Location Map



LOCATION MAP
27 OLD STATE ROAD

SCALE: 1" = 2000'

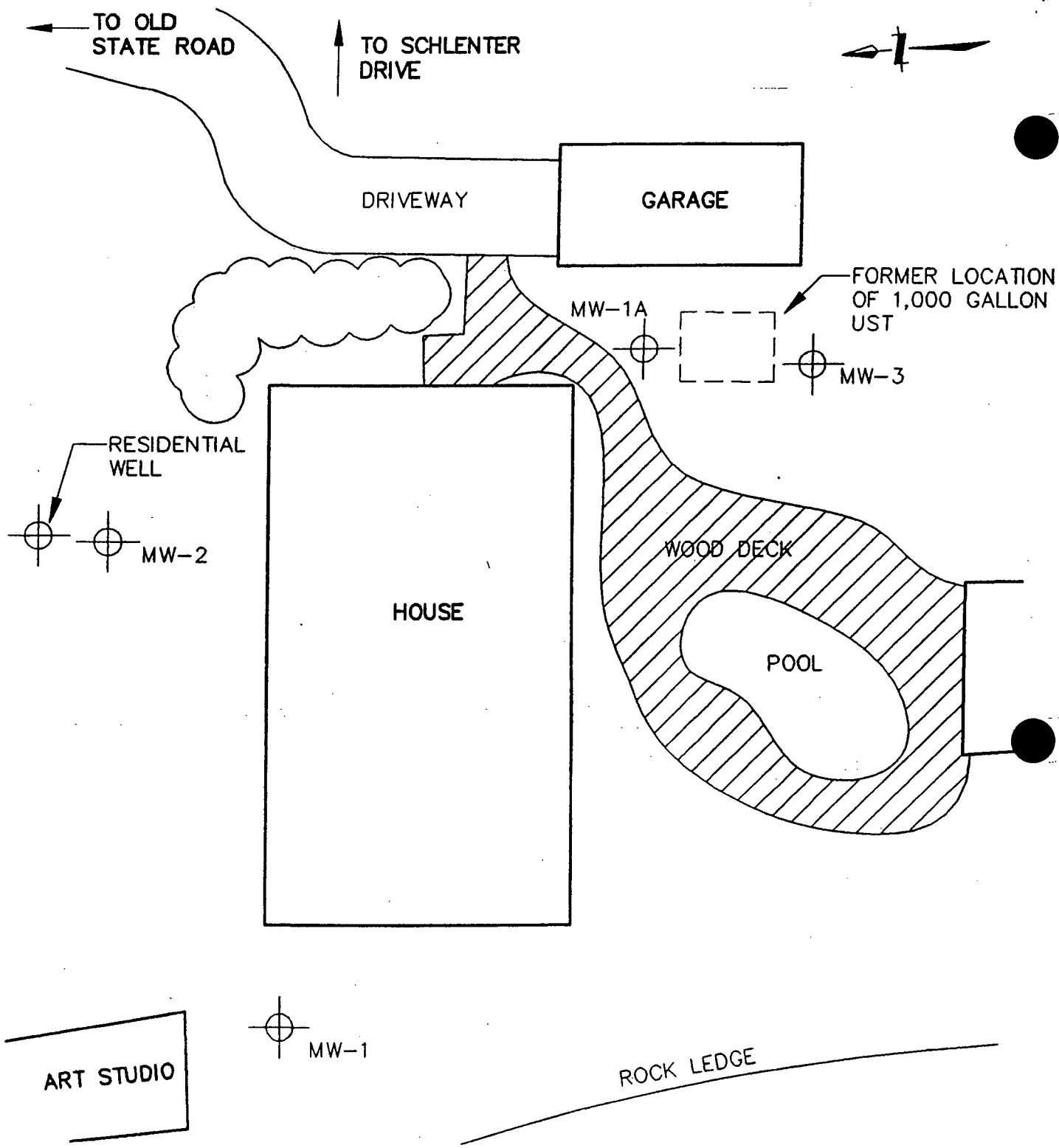
H2MGROUP ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS

MELVILLE, N.Y. TOTOWA, N.J.

M:\cadd\CNA 1\Loc-MAP.dwg August 25 2000 1:53pm By:cadd6

Figure 2. Topographic M

U.S.G.S. Topographic Map
Hopewell Junction, N.Y. -- 7.5 Minute Quadrangle



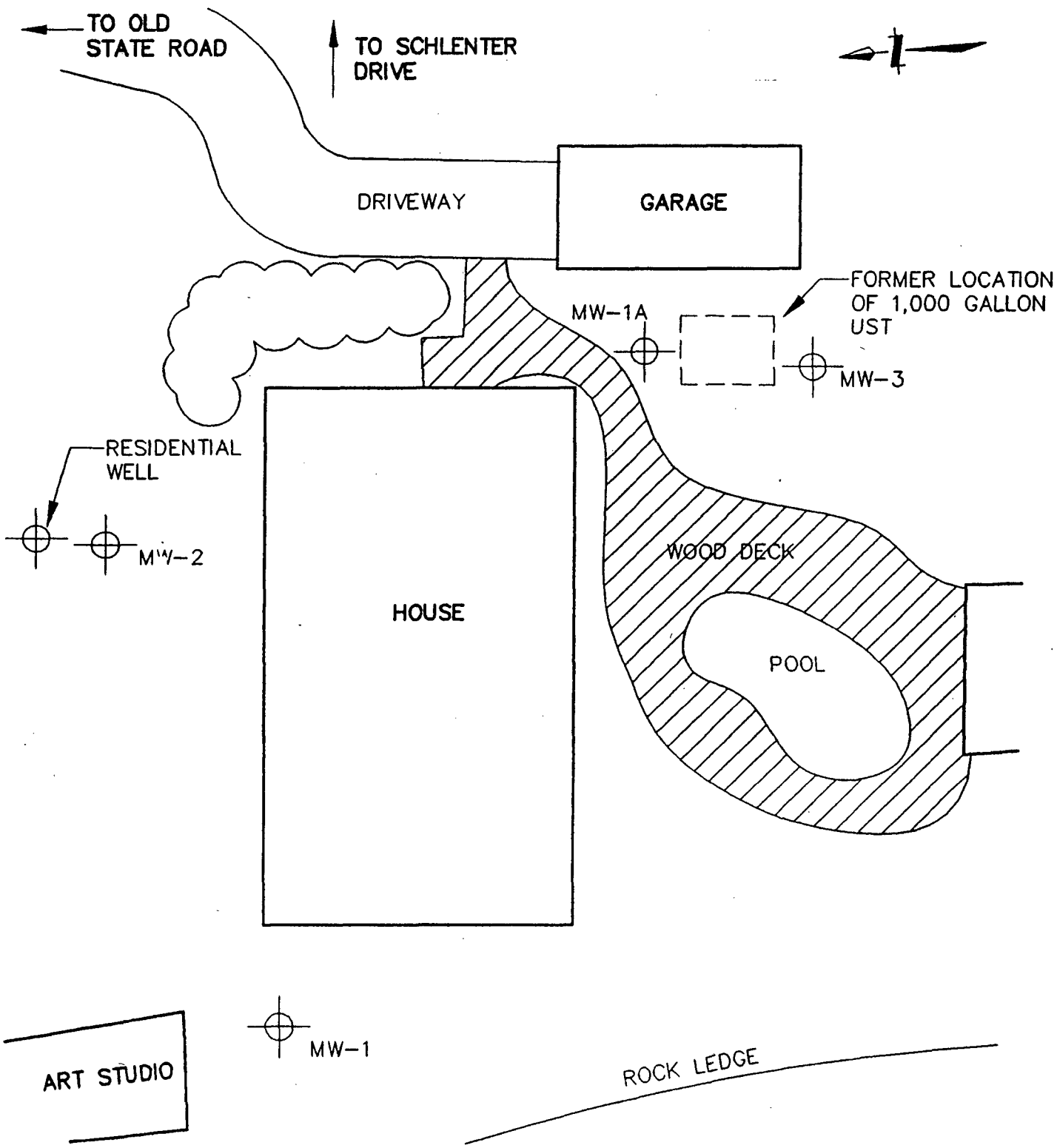
27 OLD STATE ROAD
HOPEWALL JUNCTION, NY
SITE PLAN

NOTES:

1. NOT TO SCALE
2. LOCATIONS APPROXIMATE.

M:\cadd\CNAI\0001\site.dwg August 29 2000 4:17pm By:cadd6

H2MGROUP ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS
MELVILLE, N.Y. TOTOWA, N.J.



27 OLD STATE ROAD
HOPEWALL JUNCTION, NY
SITE PLAN

NOTES:

1. NOT TO SCALE
2. LOCATIONS APPROXIMATE.

M:\CNAI\0001\site.dwg August 29 2000 4:17pm By:cadd6

H2MGROUP ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS
MELVILLE, N.Y. TOTOWA, N.J.

Figure 3. Groundwater Sampling Record Sheet

GROUNDWATER SAMPLING RECORD SHEET

SITE: 27 Old State Road DATE: 6/27/00 TIME: 1:15pm

JOB#: CNAI 0001 T1 SAMPLERS: CJF/CC

SAMPLE LOCATION: MW-1 MEASURING PT: TOC

DEPTH TO WATER: 76.94 FT. WELL DEPTH: 93.65 FT.

STATIC WATER LEVEL: 16.71 FT. STATIC VOLUME: 2.72 GALS.

MIN. VOLUME TO BE REMOVED: 8.17 GALS.

EVACUATION TECHNIQUE: SUBM. PUMP ☐ CENT. PUMP ☐

BLADDER PUMP ☐ BAILER ☒

DEPTH TO PUMP INTAKE: N/A FT.

FLOW RATE: N/A GPM GALS. PER LINEAR FT.

TIME PUMPED: N/A MINS. 2 INCH x .163

TOTAL VOLUME PURGED: 8.04 GALS. 4 INCH x .653

SAMPLING ANALYSIS: NYSDEC STARS VOCs / SVOCs + MTBE

FIELD PARAMETERS:

TEMP: 17.1 °C CONDUCTIVITY: 772 us

pH: 7.09 s.u. TURBIDITY: *NM NTU

NOTES: * Not measured

No evidence of petroleum sheen, odor, or product

SIGNATURE:

GROUNDWATER SAMPLING RECORD SHEET

SITE: 27 Old State Road DATE: 6/27/10 TIME: 1:25 pm

JOB#: CNAI 0001 T1 SAMPLERS: CJF / CC

SAMPLE LOCATION: MW-2 MEASURING PT: TOC

DEPTH TO WATER: 80.22 FT. WELL DEPTH: 101.95 FT.

STATIC WATER LEVEL: 21.73 FT. STATIC VOLUME: 3.54 GALS.

MIN. VOLUME TO BE REMOVED: 10.62 GALS.

EVACUATION TECHNIQUE: SUBM. PUMP ☐ CENT. PUMP ☐

BLADDER PUMP ☐ BAILER ☒

DEPTH TO PUMP INTAKE: N/A FT.

FLOW RATE: N/A GPM GALS. PER LINEAR FT.

TIME PUMPED: N/A MINS. 2 INCH x .163

TOTAL VOLUME PURGED: 10.0+ GALS. 4 INCH x .653

SAMPLING ANALYSIS: NYSDEC STARS VOCs / SVOCs + MTBE

FIELD PARAMETERS:

TEMP: 19.7 °C CONDUCTIVITY: 1071 us

pH: 7.16 s.u. TURBIDITY: * NM NTU

NOTES: * Not measured

No evidence of petroleum sheen, odor, or product.

SIGNATURE: [signature]

H2MGROUP ENGINEERS · ARCHITECTS · PLANNERS · SCIENTISTS · SURVEYORS
MELVILLE, N.Y. TOTOWA, N.J.

GROUNDWATER SAMPLING RECORD SHEET

SITE: 27 Old State Road DATE: 6/27/00 TIME: 2:55pm

JOB#: CNAI 0001 T1 SAMPLERS: CJF/CC

SAMPLE LOCATION: MW-3 MEASURING PT: TOC

DEPTH TO WATER: 78.12 FT. WELL DEPTH: 105.56 FT.

STATIC WATER LEVEL: 27.44 FT. STATIC VOLUME: 4.47 GALS.

MIN. VOLUME TO BE REMOVED: 13.4 GALS.

EVACUATION TECHNIQUE: SUBM. PUMP ☐ CENT. PUMP ☐

BLADDER PUMP ☐ BAILER ☒

DEPTH TO PUMP INTAKE: N/A FT.

FLOW RATE: N/A GPM GALS. PER LINEAR FT.

TIME PUMPED: N/A MINS. 2 INCH x .163

TOTAL VOLUME PURGED: 13.0+/- GALS. 4 INCH x .653

SAMPLING ANALYSIS: NYSDEC STARS VOCs/SVOCs + MTBE

FIELD PARAMETERS:

TEMP: 16.2 °C CONDUCTIVITY: 1525 us

pH: 6.90 s.u. TURBIDITY: * NM NTU

NOTES: * Not measured

No evidence of petroleum sheen, odor, or product.

SIGNATURE: [signature]

H2MGROUP ENGINEERS · ARCHITECTS · PLANNERS · SCIENTISTS · SURVEYORS
MELVILLE, N.Y. TOTOWA, N.J.

Figure 4. Laboratory Analytical - Groundwater

H2M LABS, INC.
575 Broad Hollow Road, Melville, NY 11747-5076
(631)694-3040 . FAX:(631)420-8436 NYSDOH ID# 10478

LABORATORY RESULTS

C.N.A. INSURANCE

Lab No. : 20000627-230

Sample Information...
Type : Ground Water
ROUTINE

Remarks: OIL SPILL INVESTIGATION

Attn To : CNAI0001

Collected : 27-JUN-2000 13:15
Received : 27-JUN-2000 18:20
Collected By : CJF03
Project No : CNAI0001
Copies To : CJF

Location: MW-1

VOLATILE STARS COMPOUNDS (8021) - ug/L

Run Number : 2470
Date Analyzed : 03-JUL-2000

Parameter(s)	Results
BENZENE	<1
TOLUENE	<1
ETHYLBENZENE	<1
1,3-XYLENE	<1
1,4-XYLENE	<1
1,2-XYLENE	<1
ISOPROPYLBENZENE	<1
N-PROPYLBENZENE	<1
1,3,5-TRIMETHYLBENZENE	<1
TERT-BUTYLBENZENE	<1
1,2,4-TRIMETHYLBENZENE	<1
SEC-BUTYLBENZENE	<1
P-ISOPROPYLTOLUENE	<1
N-BUTYLBENZENE	<1
NAPHTHALENE	<1
XYLENES (TOTAL)	<1
METHYL TERT.BUTYL ETHER	<1

Date Issued : 07/10/2000

ORIGINAL

Report for client information only

Joann M. Slavin
Laboratory Director

HZM LABS, INC.
575 Broad Hollow Road, Melville, NY 11747-5076
(631)694-3040 . FAX:(631)420-8436 NYSDOH ID# 10478

LABORATORY RESULTS

C.N.A. INSURANCE

Lab No. : 20000627-230

Sample Information...
Type : Ground Water
ROUTINE

Remarks: OIL SPILL INVESTIGATION

Attn To : CNAI0001

Collected : 27-JUN-2000 13:15
Received : 27-JUN-2000 18:20
Collected By : CJF03
Project No : CNAI0001
Copies To : CJF

Location: MW-1

BNA `STARS'BASE NEUTRALS - ug/L

Date Extracted: 29-JUN-2000

Run Number : D07074
Date Analyzed : 05-JUL-2000

Parameter(s)	Results
NAPHTHALENE	<5
ACENAPHTHENE	<5
FLUORENE	<5
PHENANTHRENE	<5
ANTHRACENE	<5
FLUORANTHENE	<5
PYRENE	<5
CHRYSENE	<5
BENZO(A)ANTHRACENE	<5
BENZO(B)FLUORANTHENE	<5
BENZO(K)FLUORANTHENE	<5
BENZO(A)PYRENE	<5
INDENO(1,2,3-C,D)PYRENE	<5
DIBENZO(A,H)ANTHRACENE	<5
BENZO(G,H,I)PERYLENE	<5

Date Issued : 07/10/2000

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Report for client information only

Joann M. Slavin
Laboratory Director

HZM LABS, INC.
575 Broad Hollow Road, Melville, NY 11747-5076
(631)694-3040 . FAX:(631)420-8436 NYSDOH ID# 10478

LABORATORY RESULTS

C.N.A. INSURANCE

Lab No. : 20000627-231

Sample Information...
Type : Ground Water
ROUTINE

Remarks: OIL SPILL INVESTIGATION

Attn To : CNAI0001

Collected : 27-JUN-2000 13:25
Received : 27-JUN-2000 18:20
Collected By : CJF03
Project No : CNAI0001
Copies To : CJF

Location: MW-2

VOLATILE`STARS'COMPOUNDS (8021) - ug/L

Run Number : 2471
Date Analyzed : 03-JUL-2000

Parameter(s)	Results
BENZENE	<1
TOLUENE	<1
ETHYLBENZENE	<1
1,3-XYLENE	<1
1,4-XYLENE	<1
1,2-XYLENE	<1
ISOPROPYLBENZENE	<1
N-PROPYLBENZENE	<1
1,3,5-TRIMETHYLBENZENE	<1
TERT-BUTYLBENZENE	<1
1,2,4-TRIMETHYLBENZENE	<1
SEC-BUTYLBENZENE	<1
P-ISOPROPYLTOLUENE	<1
N-BUTYLBENZENE	<1
NAPHTHALENE	<1
XYLENES (TOTAL)	<1
METHYL TERT.BUTYL ETHER	11

Date Issued : 07/10/2000

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Report for client information only

Joann M. Slavin
Laboratory Director

H2M LABS, INC.
575 Broad Hollow Road, Melville, NY 11747-5076
(631)694-3040 . FAX:(631)420-8436 NYSDOH ID# 10478

LABORATORY RESULTS

C.N.A. INSURANCE

Lab No. : 20000627-231

Sample Information...
Type : Ground Water
ROUTINE

Remarks: OIL SPILL INVESTIGATION

Attn To : CNAI0001

Collected : 27-JUN-2000 13:25
Received : 27-JUN-2000 18:20
Collected By : CJF03
Project No : CNAI0001
Copies To : CJF

Location: MW-2

BNA 'STARS'BASE NEUTRALS - ug/L

Date Extracted: 29-JUN-2000

Run Number : D07075
Date Analyzed : 05-JUL-2000

Parameter(s)	Results
NAPHTHALENE	<5
ACENAPHTHENE	<5
FLUORENE	<5
PHENANTHRENE	<5
ANTHRACENE	<5
FLUORANTHENE	<5
PYRENE	<5
CHRYSENE	<5
BENZO(A)ANTHRACENE	<5
BENZO(B)FLUORANTHENE	<5
BENZO(K)FLUORANTHENE	<5
BENZO(A)PYRENE	<5
INDENO(1,2,3-C,D)PYRENE	<5
DIBENZO(A,H)ANTHRACENE	<5
BENZO(G,H,I)PERYLENE	<5

Date Issued : 07/10/2000

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Report for client information only

Joann M. Slavin
Laboratory Director

H2M LABS, INC.

LABORATORY RESULTS

575 Broad Hollow Road, Melville, NY 11747-5076
(631)694-3040 . FAX:(631)420-8436 NYSDOH ID# 10478

C.N.A. INSURANCE

Lab No. : 20000627-232

Sample Information...
Type : Ground Water
ROUTINE

Remarks: OIL SPILL INVESTIGATION

Attn To : CNAI0001

Collected : 27-JUN-2000 14:55
Received : 27-JUN-2000 18:20
Collected By : CJF03
Project No : CNAI0001
Copies To : CJF

Location: MW-3

VOLATILE`STARS'COMPOUNDS (8021) - ug/L

Run Number : 2472
Date Analyzed : 03-JUL-2000

Parameter(s)	Results
BENZENE	<1
TOLUENE	<1
ETHYLBENZENE	<1
1,3-XYLENE	<1
1,4-XYLENE	<1
1,2-XYLENE	<1
ISOPROPYLBENZENE	<1
N-PROPYLBENZENE	<1
1,3,5-TRIMETHYLBENZENE	<1
TERT-BUTYLBENZENE	<1
1,2,4-TRIMETHYLBENZENE	<1
SEC-BUTYLBENZENE	<1
P-ISOPROPYLTOLUENE	<1
N-BUTYLBENZENE	<1
NAPHTHALENE	<1
XYLENES (TOTAL)	<1
METHYL TERT.BUTYL ETHER	<1

Date Issued : 07/10/2000

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Report for client information only

Joann M. Slavin

Laboratory Director

H2M LABS, INC.
575 Broad Hollow Road, Melville, NY 11747-5076
(631)694-3040 . FAX:(631)420-8436 NYSDOH ID# 10478

LABORATORY RESULTS

C.N.A. INSURANCE

Lab No. : 20000627-232

Sample Information...
Type : Ground Water
ROUTINE

Remarks: **OIL SPILL INVESTIGATION**

Attn To : CNAI0001

Collected : 27-JUN-2000 14:55
Received : 27-JUN-2000 18:20
Collected By : CJF03
Project No : CNAI0001
Copies To : CJF

Location: **MW-3**

BNA `STARS'BASE NEUTRALS - ug/L

Date Extracted: **29-JUN-2000**

Run Number : **D07076**
Date Analyzed : **05-JUL-2000**

Parameter(s)	Results
NAPHTHALENE	<5
ACENAPHTHENE	<5
FLUORENE	<5
PHENANTHRENE	<5
ANTHRACENE	<5
FLUORANTHENE	<5
PYRENE	<5
CHRYSENE	<5
BENZO(A)ANTHRACENE	<5
BENZO(B)FLUORANTHENE	<5
BENZO(K)FLUORANTHENE	<5
BENZO(A)PYRENE	<5
INDENO(1,2,3-C,D)PYRENE	<5
DIBENZO(A,H)ANTHRACENE	<5
BENZO(G,H,I)PERYLENE	<5

Date Issued : 07/10/2000

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Report for client information only

Joann M. Slavin
Laboratory Director

Figure 5. Laboratory Analytical – Product I.D.

H2M LABS, INC.

LABORATORY RESULTS

575 Broad Hollow Road, Melville, NY 11747-5076
(631)694-3040 . FAX:(631)420-8436 NYSDOH ID# 10478

C.N.A. INSURANCE

Lab No. : 20000614-015

Sample Information...
Type : Misc. Liquid
ROUTINE

Remarks: N.P.=NOT PRESENT

Attn To : CNAI0001

Collected : 09-JUN-2000
Received : 14-JUN-2000 10:00
Collected By : CJF03
Project No : CNAI0001
Copies To : BPK

Location: DOMESTIC WELL

PETROLEUM PRODUCTS - mg/L

Date Extracted: 15-JUN-2000

Run Number : B05283
Date Analyzed : 30-JUN-2000

Parameter(s)	Results
GASOLINE	N.P.
LUBRICATING OILS	N.P.
TOTAL FUEL OILS	5000000
KEROSENE	<30000

Date Issued : 07/10/2000

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Laboratory Director

Figure 6. Laboratory Analytical – MTBE I.D.

H2M LABS, INC.
575 Broad Hollow Road, Melville, NY 11747-5076
(631)694-3040 . FAX:(631)420-8436 NYSDOH ID# 10478

LABORATORY RESULTS

C.N.A. INSURANCE

Lab No. : 20000711-071

Sample Information...
Type : Misc. Solid
SPECIAL

Attn To : CNAI0001

Collected : 09-JUN-2000
Received : 14-JUN-2000 12:00
Collected By : BPK03
Project No : CNAI0001
Copies To : BPK

Location: **DOMESTIC WELL (OIL LAYER)**

GRAB

METHYL TERT.BUTYL ETHER - ug/kg

Run Number : **P15562**
Date Analyzed : **15-JUL-2000**

Parameter(s)	Results
METHYL TERT. BUTYL ETHER	<5000

Date Issued : 07/20/2000

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Report for client information only

Laboratory Director

GeoWorx CONSULTING LLC ©

RECEIVED

JUL 22 2002

NYS-DEC
REGION 3-NEW PALTZ

July 19, 2002

Mr. Pete DeCicco
NYSDEC- Region 3
21 South Putt Corners Rd.
New Paltz, New York 12561-1696

RE: Site Investigation and Site Update Report
Eckes Residence
27 Old State Road
Hopewell Junction, NY
USAA Claim # 2679788-91A, DOL 1-18-00
NYDEC Case # 99-08092 & 99-35033

Dear Mr. DeCicco:

GeoWorx Consulting, LLC, has prepared the following site investigation and site update summary report for your review for the above referenced address. If you have any questions regarding this matter, please feel free to contact me at (732) 650-1186.

Sincerely,

Nancy O'Connor

Nancy O'Connor
Office Manager/Field Technician
GeoWorx Consulting, LLC.

711 Raritan Ave., PMB#60
Highland Park, NJ 08904
Phone 732.650.1186 Fax 732.650.0926

GeoWorx CONSULTING L.L.C.

RECEIVED
JUL 22 2002
NYS-DEC
REGION 3-NEW P

July 17, 2002

Mr. Pete DeCicco
NYSDEC- Region 3
21 South Putt Corners Rd.
New Paltz, New York 12561-1696

RE: Site Investigation and Site Update Report
Eckes Residence
27 Old State Road
Hopewell Junction, NY
USAA Claim # 2679788-91A, DOL 1-18-00
NYDEC Case # 99-08092 & 99-35033

Dear Mr. DeCicco:

GeoWorx Consulting, LLC, has prepared the following site investigation and site update summary report for a site at the above referenced address. The site was in regard to a confirmed discharge from the supply line of 550-gallon underground storage tank (UST), which was used to store #2 heating oil at the residence.

Site Investigation

GeoWorx Consulting was onsite on Friday, January 25, 2001 to conduct a site investigation to determine if the former basement excavation was completed properly, to determine the quality of the water passing in, through, and out of the drinking water filtration system, and to determine the current condition of the groundwater in the potable well and the monitoring wells.

711 Raritan Ave., PMB#60
Highland Park, NJ 08904
Phone 732.650.1186 Fax 732.650.0926

Soil Boring Sampling and Results

Four (4) hand augured borings (B1 thru B4) were performed in various locations in the basement of the residence. B1 was performed on the former northern sidewall of the basement excavation to a depth 6' below grade where refusal was met. The soil column consisted of medium, brown fine sand with silt. A strong petroleum odor was discovered. A photo ionization detector (PID) was used to screen the soil. PID readings were taken at 16" to 1' below grade and ranged from 105 to 130 ppm. A sample was collected at 1' below grade for laboratory analysis. Boring B2 was performed to 2' below grade where refusal was met, at the former southern sidewall of the excavation, near the crawl space. The soil column consisted of clayey silt and dry. A slight petroleum odor was discovered. The PID reading taken at 2' below grade was 80 ppm. A sample was collected just below the stone backfill at 1' below grade. B3 was attempted on the former eastern sidewall of the excavation. Refusal was met 1' below grade because the stone backfill was thicker and would not allow the bore hole to stay open. The PID reading ranged from 10-14 ppm. B4 was unattainable due to the foul odor from the cat litter box located in the stair well area.

All soil samples were delivered to Steven Trent Services (STL), of Newburgh, NY. STL is a NYSDEC certified laboratory. All soil analyses consisted of Volatile Organic Stars Compounds (VO) using EPA Method 8021B and Semi-Volatile Organic Stars Compounds (semi-VO) using EPA Method 8270. Analytical results indicate the presence of several compounds, however none exceeded the NYSDEC TAGM cleanup guidelines. See Table 1 below for the complete listing of the compounds detected and their respective concentrations and NYSDEC guidelines.

Table 1
Eckes Residence
Site Investigation Soil Sampling Results
January 25, 2002

Compounds	Method	ER-B1	ER-B2	NYSDEC Limits
Benzene	8021	ND	ND	0.06
Toluene	8021	ND	ND	1.5
Ethylbenzene	8021	ND	ND	5.5
m & p Xylenes	8021	ND	ND	1.2
o-Xylene	8021	ND	ND	1.2
Isopropylbenzene	8021	0.45	0.54	N/A
n-Propylbenzene	8021	0.33	0.46	N/A
1,3,5-Trimethylbenzene	8021	1.4	0.68	N/A
Tert-Butylbenzene	8021	ND	ND	N/A
1,2,4-Trimethylbenzene	8021	5.5	2.2	N/A
Sec-Butylbenzene	8021	0.68	0.41	N/A
4-Isopropyltoluene	8021	ND	ND	N/A
n-Butylbenzene	8021	5.9	4.4	N/A
Napthalene	8021	12	1.4	13
Napthalene	8270	8.5	ND	13
Phenanthrene	8270	12	7.4	220
All Other Compounds	8270	ND	ND	NA

reported in parts per million (ppm)

Potable Well and Monitoring Well Sampling and Results

On January 25, 2002, a drinking water sample from the potable well (ER-DW) and drinking water system samples from the treatment system were collected (ER-Influent, ER-Middle and ER-Effluent). Free product was observed floating on top of the water column in the potable but no petroleum sheen or odors were observed in the drinking water system samples. All samples were delivered to Steven Trent Services, of Newburgh, NY. All analyses consisted of PID MTBE EPA Method 502.2. The only compound detected in any of the analyses was n-butylbenzene at a concentration of 0.83 parts per billion (ppb) in the potable well drinking water sample, however the concentration is below NYSDEC guidelines. The depth to groundwater in the potable well is approximately 92.8 below grade, but the total depth of the potable well is 192' below grade; the difference being nearly 100'. The free product observed in the potable well is not only not migrating through the water column down to the depth of the well pump, but it is also not even dissolving into the water at all.

On Monday, January 28, 2002, GeoWorx sampled the monitoring wells. MW-1 was found dry to approximately 92' below grade. The depth of groundwater was measured to

be approximately 89.5' below grade in MW-2 and approximately ¼" of visible product was observed in the well. The depth of groundwater was measured to be approximately 52.5' below grade MW-3, most likely much higher because MW-3 is adjacent to the septic field. The groundwater in MW-3 was observed to be absent of any petrolelum sheen or odors. All samples were delivered to Steven Trent Services, of Newburgh, NY. All analyses consisted of Volatile Organic Stars Compounds (VO) using EPA Method 8021B and Semi-Volatile Organic Stars Compounds (semi-VO) using EPA Method 8270. Analytical results indicate several compounds exceeding the NYSDEC cleanup guidelines in MW-2 and no compounds detected in MW-3. See Table 1 below for a listing of the compounds detected and their respective concentrations and NYSDEC guidelines.

Table 2
Eckes Residence
Site Investigation Ground Water and Drinking Water Sample Results
January 25 & 28, 2002

	System Samples			Potable Well	Monitoring Wells		NYSDEC
Compounds	Influent	Middle	Effluent	DW	MW2	MW3	Guidelines
Benzene	ND	ND	ND	ND	ND	ND	0.7
Toluene	ND	ND	ND	ND	ND	ND	5
Ethylbenzene	ND	ND	ND	ND	ND	ND	5
m&p Xylenes	ND	ND	ND	ND	**48**	ND	**5**
o-Xylene	ND	ND	ND	ND	**51**	ND	**5**
Isopropylbenzene	ND	ND	ND	ND	ND	ND	5
n-Propylbenzene	ND	ND	ND	ND	ND	ND	5
1,3,5-Trimethylbenzene	ND	ND	ND	ND	**74**	ND	**5**
Tert-Butylbenzene	ND	ND	ND	ND	ND	ND	5
1,2,4-Trimethylbenzene	ND	ND	ND	ND	**120**	ND	**5**
Sec-Butylbenzene	ND	ND	ND	ND	ND	ND	5
Isopropyltoluene	ND	ND	ND	ND	**11**	ND	**5**
n-Butylbenzene	ND	ND	ND	0.83	**66**	ND	**5**
Naphthalene	ND	ND	ND	ND	88/89	ND	10
MTBE	ND	ND	ND	ND	ND	ND	50
Phenanthracene	-	-	-	-	**380**	ND	**50**
Anthracene	-	-	-	-	**100**	ND	**50**
Pyrene	-	-	-	-	**55**	ND	**50**

all results and guidelines are reported in parts per billion (ppb)

Monitoring Well Sampling and Results to Date

On Thursday, March 3, 2002, Water Resource Technology (WRT) with GeoWorx oversight vacuum pumped monitor well MW-2 which is located adjacent to the potable well, but closer to the house. MW-2 measured 92.50 to grade to water and had a ¼" of visible product and exhibited a heavy petroleum odor. WRT pumped approximately 3 gallons of oily water and installed a 100 foot boom to absorb the free product.

On Monday, April 15, 2002, GeoWorx returned to the site to sample MW-2 and to inspect the boom. The boom was found clear from the bottom to the top. Groundwater was measured at 92.65' to grade to water and exhibited a faint petroleum odor and a sample was collected. The sample was delivered to ChemTech Laboratories of Mountainside, NJ. ChemTech is a NYSDEC certified laboratory. The analysis consisted of Volatile Organic Stars Compounds (VO) using EPA Method 8021B and Semi-Volatile Organic Starts Compounds (semi-VO) using EPA Method 8270. VO analytical result indicated Benzene at a concentration of 1.3 parts per billion (ppb), which exceeds the NYSDEC cleanup criteria of 0.7 ppb, Naphthalene at a concentration of 1.2, which is below the NYSDEC cleanup criteria of 10 ppb and MTBE at a concentration of 2.9, which is below the NYSDEC cleanup criteria of 50 ppb. Semi-VO analytical results indicated Pyrene at a concentration of 1.5 ppb which is also below the NYSDEC cleanup criteria of 50 ppb.

Table 3
Eckes Residence
Ground Water Sample Results

Compounds	Method	1/28/2002 Results (ppb)	4/15/2002 Results (ppb)	NYSDEC Limits (ppb)
Benzene	8021	Undetected	**1.3**	**0.7**
Toluene	8021	Undetected	Undetected	5
Ethylbenzene	8021	Undetected	Undetected	5
m&p Xylenes	8021	**48**	Undetected	5
o-Xylene	8021	**51**	Undetected	5
Isopropylbenzene	8021	Undetected	Undetected	5
n-Propylbenzene	8021	Undetected	Undetected	5
1,3,5-Trimethylbenzene	8021	**74**	Undetected	5
Tert-Butylbenzene	8021	Undetected	Undetected	5
1,2,4-Trimethylbenzene	8021	**120**	Undetected	5
Sec-Butylbenzene	8021	Undetected	Undetected	5
Isopropyltoluene	8021	**11**	Undetected	5
n-Butylbenzene	8021	**66**	Undetected	5
Naphthalene	8021	**88/89**	1.2	10
MTBE	8021	Undetected	**2.9**	50
Phenanthracene	8270	**380**	Undetected	50
Anthracene	8270	**100**	Undetected	50
Pyrene	8270	**55**	**1.5**	**50**

Summary and Conclusions

Based on field observations and laboratory analytical results, the following conclusions can be made:

- Although the soil beneath the basement floor does exhibit a petroleum odor, all analytical result indicated that the samples are below NYSDEC guidelines. The concrete of the basement floor will prevent all petroleum odors from entering the basement.

- The drinking water system samples are below NYSDEC guidelines. The water going into and out of the system is safe to drink, by NYSDEC guidelines.

- Free product was observed in potable well, however the product is not, at the time of the sampling event, dissolving into the water column. The depth of the potable well is 192' below grade, and although not confirmed, the well pump is assumed to be near the bottom of the well. Even a severe drought will not lower the water table 100' to bring the product near the well pump.

- Laboratory results and field observation indicated that monitoring well MW-3 is clean. Monitoring well MW-1 is partially collapsed and/or dry. Free product was observed in monitoring well MW-2, the monitoring well closest to the potable well. Laboratory results indicate that the product is dissolving into the water column and the groundwater results are in excess of the NYSDEC guidelines. However, after 3 gallons of free product was removed from MW-2 and a absorbent boom was installed for approximately one month, MW-2 was re-sampled and found clean. GeoWorx Consulting if uncertain at this time if the lack of product in MW-2 is due to minimal remedial efforts or an effect of seasonal changes.

It is GeoWorx Consulting's understanding that H2M will be conducting the remedial efforts on the existing potable well, conduct a monitoring program of the groundwater at the site, and will continue to conduct the operation, maintenance, and monitoring of the drinking water treatment system.

If you have any questions regarding the above referenced case, please do not hesitate to contact me at (732) 650-1186.

Sincerely yours,

Sandra Simchick

Sandra Simchick
Subsurface Evaluator
GeoWorx Consulting, LLC

SEVERN TRENT SERVICES

STL Newburgh

CHAIN OF CUSTODY

315 Fullerton Avenue
Newburgh, NY 12550
TEL (845) 562-0890
FAX (845) 562-0841

CUSTOMER NAME: GeoWorx Consulting
ADDRESS: 711 Raritan Ave, PMB #60
CITY, STATE, ZIP: Highland Park, NJ 08904 732-650-1186
NAME OF CONTACT: Sandra Simchick
PHONE NO.:
PROJECT LOCATION: Eckes Residence
PROJECT NUMBER / PO NO.: —

REPORT TYPE
STANDARD ☒ ISRA ☐
NJ REG ☐
NYASP A☐ B☐ CLP☐
OTHER _____

TURNAROUND
☒ NORMAL _____
☐ QUICK _____
☐ VERBAL _____

REPORT # (Lab Use Only)
208014
SAMPLE TEMP. _____ C
SAMPLE REC'D ON ICE Y ____ N ____
pH CHECK Y ____ N ____
REVIEWED BY: _____

NY PUBLIC WATER SUPPLIES
SOURCE ID ____
ELRP TYPE ____
FEDERAL ID ____

Matrix
DW = DRINKING WATER S = SOIL O = OIL
WW = WASTE WATER SL = SLUDGE GW = GROUND WATER

NOTE: SAMPLE TEMPERATURE UPON RECEIPT MUST BE 4° ± 2°C.

LAB USE ONLY

STL #	SAMPLING DATE	TIME AM PM	COMP	GRAB	MATRIX	CLIENT I.D.	Total Number of Containers	40ml Glass HCL	Liter Amber Sulfuric Acid	Liter Amber Organic Washed	Liter Plastic Nitric Acid	Liter Plastic Sodium Hydroxide	Liter Plastic	Liter Plastic Sulfuric Acid	250ml Plastic	125ml Plastic Sterile	250ml Amber	2 oz. Qorpak	ANALYSIS REQUESTED
	1/25/02	2:10		X	water	ER-Influent	3	3											502.2-PID MTBE
	1/25/02	2:30		X	water	ER-middle	3	3											502.2-PID MTBE
	1/25/02	2:40		X	water	ER-Efluent	3	3											502.2-PID MTBE
	1/25/02	12:15		X	Soil	ER-B1-Soil	1	[illegible]										PSOL	VOC+SVOC Stars 8270+8021B
	1/25/02	1:30		X	Soil	ER-B2-Soil	1											PSOL	VOC+SVOC Stars 8270+8021B
	~~1/25/02~~	~~1:40~~		~~X~~	~~water~~	~~ER-mw1~~	~~5~~	~~3~~		~~2~~									~~VOC+SVOC Stars 8021B+8270~~
	1/25/02	1:40		X	water	ER-DW	3	3											502.2-PID MTBE

SAMPLES SUBMITTED FOR ANALYSIS WILL BE SUBJECTED TO THE STL TERMS AND CONDITIONS OF SALE (SHORT FORM) UNLESS ALTERNATE TERMS ARE AGREED IN WRITING.

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
				[signature]		1/25/02	3:50
SAMPLED BY Sandra Simchick	COMPANY GeoWorx Consulting	DATE 1/25/02	TIME 3:50 pm	RECEIVED BY [signature]	COMPANY STL	DATE 1/25/02	TIME 3:50 pm
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

COMMENTS _____

SAMPLE INFORMATION
Date: 02/06/2002

Job Number.: 208014
Customer...: STL Customer
Attn.....: SANDRA SIMCHICK

Project Number.....: 99999903
Customer Project ID....: GEOWORX CONSULTING
Project Description....: Walkin Project for Rick Bayer

Laboratory Sample ID	Customer Sample ID	Sample Matrix	Date Sampled	Time Sampled	Date Received	Time Received
208014-1	ER-INFLUENT	Pot. Water	01/25/2002	14:10	01/25/2002	15:50
208014-2	ER-MIDDLE	Pot. Water	01/25/2002	14:30	01/25/2002	15:50
208014-3	ER-EFFLUENT	Pot. Water	01/25/2002	14:40	01/25/2002	15:50
208014-4	ER-B1-SOIL	Soil	01/25/2002	14:15	01/25/2002	15:50
208014-5	ER-B2-SOIL	Soil	01/25/2002	13:30	01/25/2002	15:50
208014-6	ER-DW	Pot. Water	01/25/2002	10:40	01/25/2002	15:50

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Fax (845) 562-0841

LABORATORY TEST RESULTS

Job Number: 208014 Date: 02/06/2002

CUSTOMER: STL Customer PROJECT: GEOWORX CONSULTING ATTN: SANDRA SIMCHICK

Customer Sample ID: ER-INFLUENT
Date Sampled.....: 01/25/2002
Time Sampled.....: 14:10
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 208014-1
Date Received.....: 01/25/2002
Time Received.....: 15:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
EPA 502.2	Volatile Organics							
	Benzene	0.50	U		0.50	ug/L	01/28/02	lsh
	Ethylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	Toluene	0.50	U		0.50	ug/L	01/28/02	lsh
	o-Xylene	0.50	U		0.50	ug/L	01/28/02	lsh
	m&p-Xylenes	0.50	U		0.50	ug/L	01/28/02	lsh
	Naphthalene	0.50	U		0.50	ug/L	01/28/02	lsh
	Methyl-tert-butyl-ether (MTBE)	1.0	U		1.0	ug/L	01/28/02	lsh
	Chlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,2-Dichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,3-Dichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,4-Dichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	Trichloroethene	0.50	U		0.50	ug/L	01/28/02	lsh
	Tetrachloroethene	0.50	U		0.50	ug/L	01/28/02	lsh
	2-Chlorotoluene	0.50	U		0.50	ug/L	01/28/02	lsh
	4-Chlorotoluene	0.50	U		0.50	ug/L	01/28/02	lsh
	Isopropylbenzene	0.50	U		0.50	ug/L	01/28/[illegible]	[illegible]
	Styrene	0.50	U		0.50	ug/L	01/28[illegible]	[illegible]
	n-Propylbenzene	0.50	U		0.50	ug/L	01/28/[illegible]	[illegible]
	tert-Butylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	sec-Butylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,3,5-Trimethylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	p-Isopropyltoluene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,2,4-Trimethylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	n-Butylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	Hexachlorobutadiene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,2,4-Trichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,2,3-Trichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 208014 Date: 02/06/2002

CUSTOMER: STL Customer PROJECT: GEOWORX CONSULTING ATTN: SANDRA SIMCHICK

Customer Sample ID: ER-MIDDLE
Date Sampled.....: 01/25/2002
Time Sampled.....: 14:30
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 208014-2
Date Received.....: 01/25/2002
Time Received.....: 15:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
EPA 502.2	Volatile Organics							
	Benzene	0.50	U		0.50	ug/L	01/28/02	lsh
	Ethylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	Toluene	0.50	U		0.50	ug/L	01/28/02	lsh
	o-Xylene	0.50	U		0.50	ug/L	01/28/02	lsh
	m&p-Xylenes	0.50	U		0.50	ug/L	01/28/02	lsh
	Naphthalene	0.50	U		0.50	ug/L	01/28/02	lsh
	Methyl-tert-butyl-ether (MTBE)	1.0	U		1.0	ug/L	01/28/02	lsh
	Chlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,2-Dichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,3-Dichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,4-Dichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	Trichloroethene	0.50	U		0.50	ug/L	01/28/02	lsh
	Tetrachloroethene	0.50	U		0.50	ug/L	01/28/02	lsh
	2-Chlorotoluene	0.50	U		0.50	ug/L	01/28/02	lsh
	4-Chlorotoluene	0.50	U		0.50	ug/L	01/28/02	lsh
	Isopropylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	Styrene	0.50	U		0.50	ug/L	01/28/02	lsh
	n-Propylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	tert-Butylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	sec-Butylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,3,5-Trimethylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	p-Isopropyltoluene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,2,4-Trimethylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	n-Butylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	Hexachlorobutadiene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,2,4-Trichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,2,3-Trichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 208014 Date: 02/06/2002

CUSTOMER: STL Customer PROJECT: GEOWORX CONSULTING ATTN: SANDRA SIMCHICK

Customer Sample ID: ER-EFFLUENT
Date Sampled.....: 01/25/2002
Time Sampled.....: 14:40
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 208014-3
Date Received.....: 01/25/2002
Time Received.....: 15:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
EPA 502.2	Volatile Organics							
	Benzene	0.50	U		0.50	ug/L	01/28/02	lsh
	Ethylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	Toluene	0.50	U		0.50	ug/L	01/28/02	lsh
	o-Xylene	0.50	U		0.50	ug/L	01/28/02	lsh
	m&p-Xylenes	0.50	U		0.50	ug/L	01/28/02	lsh
	Naphthalene	0.50	U		0.50	ug/L	01/28/02	lsh
	Methyl-tert-butyl-ether (MTBE)	1.0	U		1.0	ug/L	01/28/02	lsh
	Chlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,2-Dichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,3-Dichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,4-Dichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	Trichloroethene	0.50	U		0.50	ug/L	01/28/02	lsh
	Tetrachloroethene	0.50	U		0.50	ug/L	01/28/02	lsh
	2-Chlorotoluene	0.50	U		0.50	ug/L	01/28/02	lsh
	4-Chlorotoluene	0.50	U		0.50	ug/L	01/28/02	lsh
	Isopropylbenzene	0.50	U		0.50	ug/L	01/2[illegible]	
	Styrene	0.50	U		0.50	ug/L	01/2[illegible]	
	n-Propylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	tert-Butylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	sec-Butylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,3,5-Trimethylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	p-Isopropyltoluene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,2,4-Trimethylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	n-Butylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	Hexachlorobutadiene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,2,4-Trichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,2,3-Trichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 208014 Date: 02/06/2002

CUSTOMER: STL Customer PROJECT: GEOWORX CONSULTING ATTN: SANDRA SIMCHICK

Customer Sample ID: ER-B1-SOIL
Date Sampled.....: 01/25/2002
Time Sampled.....: 14:15
Sample Matrix.....: Soil

Laboratory Sample ID: 208014-4
Date Received.....: 01/25/2002
Time Received.....: 15:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
SW846 8270C	Semivolatile Organics							
	Naphthalene	8500			3300	ug/Kg	02/01/02	caw
	Acenaphthene	3300	U		3300	ug/Kg	02/01/02	caw
	Fluorene	3300	U		3300	ug/Kg	02/01/02	caw
	Phenanthrene	12000			3300	ug/Kg	02/01/02	caw
	Anthracene	3300	U		3300	ug/Kg	02/01/02	caw
	Fluoranthene	360	J		3300	ug/Kg	02/01/02	caw
	Pyrene	770	J		3300	ug/Kg	02/01/02	caw
	Benzo(a)anthracene	3300	U		3300	ug/Kg	02/01/02	caw
	Chrysene	3300	U		3300	ug/Kg	02/01/02	caw
	Benzo(b)fluoranthene	3300	U		3300	ug/Kg	02/01/02	caw
	Benzo(k)fluoranthene	3300	U		3300	ug/Kg	02/01/02	caw
	Benzo(a)pyrene	3300	U		3300	ug/Kg	02/01/02	caw
	Indeno(1,2,3-cd)pyrene	3300	U		3300	ug/Kg	02/01/02	caw
	Dibenzo(a,h)anthracene	3300	U		3300	ug/Kg	02/01/02	caw
	Benzo(ghi)perylene	3300	U		3300	ug/Kg	02/01/02	caw
SW846 8021B	Volatile Organics							
	Benzene	250	U		250	ug/Kg	01/29/02	rmd
	Ethylbenzene	250	U		250	ug/Kg	01/29/02	rmd
	Toluene	250	U		250	ug/Kg	01/29/02	rmd
	o-Xylene	180	J		250	ug/Kg	01/29/02	rmd
	m&p-Xylenes	250	U		250	ug/Kg	01/29/02	rmd
	Naphthalene	12000			250	ug/Kg	01/29/02	rmd
	Methyl-tert-butyl-ether (MTBE)	250	U		250	ug/Kg	01/29/02	rmd
	Isopropylbenzene	250	U		250	ug/Kg	01/29/02	rmd
	n-Propylbenzene	330			250	ug/Kg	01/29/02	rmd
	tert-Butylbenzene	250	U		250	ug/Kg	01/29/02	rmd
	sec-Butylbenzene	680			250	ug/Kg	01/29/02	rmd
	1,3,5-Trimethylbenzene	1400			250	ug/Kg	01/29/02	rmd
	p-Isopropyltoluene	450			250	ug/Kg	01/29/02	rmd
	1,2,4-Trimethylbenzene	5500			250	ug/Kg	01/29/02	rmd
	n-Butylbenzene	5900			250	ug/Kg	01/29/02	rmd

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LABORATORY TEST RESULTS

Job Number: 208014 Date: 02/06/2002

CUSTOMER: STL Customer PROJECT: GEOWORX CONSULTING ATTN: SANDRA SIMCHICK

Customer Sample ID: ER-B2-SOIL
Date Sampled.....: 01/25/2002
Time Sampled.....: 13:30
Sample Matrix.....: Soil

Laboratory Sample ID: 208014-5
Date Received.....: 01/25/2002
Time Received.....: 15:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
SW846 8270C	Semivolatile Organics							
	Naphthalene	3300	U		3300	ug/Kg	02/01/02	caw
	Acenaphthene	3300	U		3300	ug/Kg	02/01/02	caw
	Fluorene	3300	U		3300	ug/Kg	02/01/02	caw
	Phenanthrene	7400			3300	ug/Kg	02/01/02	caw
	Anthracene	1800	J		3300	ug/Kg	02/01/02	caw
	Fluoranthene	480	J		3300	ug/Kg	02/01/02	caw
	Pyrene	2500	J		3300	ug/Kg	02/01/02	caw
	Benzo(a)anthracene	3300	U		3300	ug/Kg	02/01/02	caw
	Chrysene	450	J		3300	ug/Kg	02/01/02	caw
	Benzo(b)fluoranthene	3300	U		3300	ug/Kg	02/01/02	caw
	Benzo(k)fluoranthene	3300	U		3300	ug/Kg	02/01/02	caw
	Benzo(a)pyrene	3300	U		3300	ug/Kg	02/01/02	caw
	Indeno(1,2,3-cd)pyrene	3300	U		3300	ug/Kg	02/01/02	caw
	Dibenzo(a,h)anthracene	3300	U		3300	ug/Kg	02/01/02	caw
	Benzo(ghi)perylene	3300	U		3300	ug/Kg	02/01/02	caw
SW846 8021B	Volatile Organics							
	Benzene	250	U		250	ug/Kg	01/29/02	rmd
	Ethylbenzene	250	U		250	ug/Kg	01/29/02	rmd
	Toluene	250	U		250	ug/Kg	01/29/02	rmd
	o-Xylene	220	J		250	ug/Kg	01/29/02	rmd
	m&p-Xylenes	250	U		250	ug/Kg	01/29/02	rmd
	Naphthalene	1400			250	ug/Kg	01/29/02	rmd
	Methyl-tert-butyl-ether (MTBE)	250	U		250	ug/Kg	01/29/02	rmd
	Isopropylbenzene	250	U		250	ug/Kg	01/29/02	rmd
	n-Propylbenzene	460			250	ug/Kg	01/29/02	rmd
	tert-Butylbenzene	250	U		250	ug/Kg	01/29/02	rmd
	sec-Butylbenzene	410			250	ug/Kg	01/29/02	rmd
	1,3,5-Trimethylbenzene	680			250	ug/Kg	01/29/02	rmd
	p-Isopropyltoluene	540			250	ug/Kg	01/29/02	rmd
	1,2,4-Trimethylbenzene	2200			250	ug/Kg	01/29/02	rmd
	n-Butylbenzene	4400			250	ug/Kg	01/29/02	rmd

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 208014 Date: 02/06/2002

CUSTOMER: STL Customer PROJECT: GEOWORX CONSULTING ATTN: SANDRA SIMCHICK

Customer Sample ID: ER-DW
Date Sampled.....: 01/25/2002
Time Sampled.....: 10:40
Sample Matrix.....: Pot. Water

Laboratory Sample ID: 208014-6
Date Received.....: 01/25/2002
Time Received.....: 15:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
EPA 502.2	Volatile Organics							
	Benzene	0.50	U		0.50	ug/L	01/28/02	lsh
	Ethylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	Toluene	0.50	U		0.50	ug/L	01/28/02	lsh
	o-Xylene	0.50	U		0.50	ug/L	01/28/02	lsh
	m&p-Xylenes	0.50	U		0.50	ug/L	01/28/02	lsh
	Naphthalene	0.50	U		0.50	ug/L	01/28/02	lsh
	Methyl-tert-butyl-ether (MTBE)	1.0	U		1.0	ug/L	01/28/02	lsh
	Chlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,2-Dichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,3-Dichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,4-Dichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	Trichloroethene	0.50	U		0.50	ug/L	01/28/02	lsh
	Tetrachloroethene	0.50	U		0.50	ug/L	01/28/02	lsh
	2-Chlorotoluene	0.50	U		0.50	ug/L	01/28/02	lsh
	4-Chlorotoluene	0.50	U		0.50	ug/L	01/28/02	lsh
	Isopropylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	Styrene	0.50	U		0.50	ug/L	01/28/02	lsh
	n-Propylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	tert-Butylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	sec-Butylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,3,5-Trimethylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	p-Isopropyltoluene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,2,4-Trimethylbenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	n-Butylbenzene	0.83			0.50	ug/L	01/28/02	lsh
	Hexachlorobutadiene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,2,4-Trichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh
	1,2,3-Trichlorobenzene	0.50	U		0.50	ug/L	01/28/02	lsh

In Description = Dry Wgt.

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
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Fax (845) 562-0841

LABORATORY CHRONICLE

Job Number: 208014 Date: 02/06/2002

CUSTOMER: STL Customer PROJECT: GEOWORX CONSULTING ATTN: SANDRA SIMCHICK

Lab ID: 208014-1 Client ID: ER-INFLUENT Date Recvd: 01/25/2002 Sample Date: 01/25/2002

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
EPA 502.2	Volatile Organics	1	15648		01/28/2002	0000	

Lab ID: 208014-2 Client ID: ER-MIDDLE Date Recvd: 01/25/2002 Sample Date: 01/25/2002

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
EPA 502.2	Volatile Organics	1	15648		01/28/2002	0000	

Lab ID: 208014-3 Client ID: ER-EFFLUENT Date Recvd: 01/25/2002 Sample Date: 01/25/2002

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
EPA 502.2	Volatile Organics	1	15648		01/28/2002	0000	

Lab ID: 208014-4 Client ID: ER-B1-SOIL Date Recvd: 01/25/2002 Sample Date: 01/25/2002

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
SW846 5030	5030 Purge & Trap	1	15559		01/28/2002	1200	
SW846 3550B	Extraction Ultrasonic (SVOC)	1	15710		01/29/2002	1000	
SW846 8270C	Semivolatile Organics	1	16116		02/01/2002	0000	10
SW846 8021B	Volatile Organics	1	15857		01/29/2002	0000	250

Lab ID: 208014-5 Client ID: ER-B2-SOIL Date Recvd: 01/25/2002 Sample Date: 01/25/2002

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
SW846 5030	5030 Purge & Trap	1	15559		01/28/2002	1200	
SW846 3550B	Extraction Ultrasonic (SVOC)	1	15710		01/29/2002	1000	
SW846 8270C	Semivolatile Organics	1	16116		02/01/2002	0000	10
SW846 8021B	Volatile Organics	1	15857		01/29/2002	0000	250

Lab ID: 208014-6 Client ID: ER-DW Date Recvd: 01/25/2002 Sample Date: 01/25/2002

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED	
EPA 502.2	Volatile Organics	1	15648		01/28/2002	0000

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The following qualifiers are used to assist in the interpretation of analytical results.

Report Comments

1) All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

2) Soil, sediment and sludge sample results are reported on a "dry weight" basis.

3) Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

Glossary of flags and qualifiers.

Inorganic Qualifiers (Q-Column)

U Indicates that the compound was analyzed for but not detected.
1 Result fails applicable drinking water standards.
2 Exceeds Lead SWDA action level of 15 ug/L.
3 Exceeds Copper SWDA action level of 1.3 mg/L or 1300 ug/L.
4 The results indicate the water to be corrosive.
5 The recommended Sodium level for a moderate diet is 270 mg/L or 270000 ug/L, and for a restricted diet is 20 mg/L or 20000 ug/L.
7 Hardness 0-99 mg/L = soft, 100-200 mg/L = moderately hard, over 200 mg/L = very hard.

Organic Qualifiers (Q-Column)

U Indicates that the compound was analyzed for but not detected.
J Indicates an estimated value. This compound meets the identification criteria, but the result is less than the specified detection limit.
B Indicates that the analyte was found in both the sample and its associated laboratory blank.
D Indicates all compounds identified in an analysis at a secondary dilution factor.
E Indicates that the analyte in an analysis has exceeded the linear calibration range.

Glossary of Terms

Surrogates (Surrogate Standards) - an organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process. For semi-volatiles, volatiles and pesticides/Arochlors, surrogate compounds are added to every blank, sample, matrix sample, matrix spike, matrix sample duplicate, matrix spike blank, and standard. These are used to evaluate analytical efficiency by measuring recovery. Poor surrogate recovery may indicate a problem with the sample composition.

Matrix Spike - an aliquot of a sample (water or soil) fortified (spiked) with known quantities of specific compounds (target analytes) and subjected to the entire analytical procedure in order to indicate the appropriateness of the method for the matrix by measuring recovery. The spiking occurs prior to sample preparation and analysis. Poor spike recovery may indicate a problem with the sample composition.

Internal Standards - an organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process. For GC/MS semi-volatiles and volatiles, internal standards are added to every blank, sample, matrix spike, matrix spike duplicate, matrix spike blank, and standard. Internal standard responses outside of established limits will adversely affect the quantitation and final concentration of target compounds.

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Attention: SANDRA SIMCHICK
STL Customer
711 RARITAN AVE DMB 60
HIGHLAND PARK, NJ 08904

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315 Fullerton Avenue
Newburgh, NY 12550
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ANALYTICAL REPORT

JOB NUMBER: 208014

Prepared For:

STL Customer
711 RARITAN AVE DMB 60
HIGHLAND PARK, NJ 08904

Attention: SANDRA SIMCHICK

Date: 02/06/2002

Signature

Date 2/6/02

Name: Richard E. Bayer

Title: Project Manager

E-Mail: rickbayer@stl-inc.com

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SEVERN TRENT SERVICES

STL Newburgh

CHAIN OF CUSTODY

315 Fullerton Avenue
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TEL (845) 562-0890
FAX (845) 562-0841

CUSTOMER NAME: GeoWorx Consulting
ADDRESS: 711 Raritan Ave PMB #60
CITY, STATE, ZIP: Highland Park, NJ 08904
NAME OF CONTACT: Sandra Simchick
PHONE NO.: 732-650-1186
PROJECT LOCATION: Eckes Residence / Hopewell Junction NY
PROJECT NUMBER / PO NO.:

REPORT TYPE
STANDARD ☐ ISRA ☐
NJ REG ☐
NYASP A ☒ B ☐ CLP ☐
OTHER ____

TURNAROUND
☒ NORMAL ____
☐ QUICK ____
☐ VERBAL ____

REPORT # (Lab Use Only)
080053
SAMPLE TEMP. ____ °C
SAMPLE REC'D ON ICE Y ____ N ____
pH CHECK Y ____ N ____
REVIEWED BY ____

NY PUBLIC WATER SUPPLIES
SOURCE ID ____
ELRP TYPE ____
FEDERAL ID ____

Matrix
DW = DRINKING WATER S = SOIL O = OIL
WW = WASTE WATER SL = SLUDGE GW = GROUND WATER

NOTE: SAMPLE TEMPERATURE UPON RECEIPT MUST BE 4° ± 2°C.

STL #	SAMPLING DATE	TIME AM/PM	COMP	GRAB	MATRIX	CLIENT I.D.	Total Number of Containers	40ml Glass HCL	Liter Amber Sulfuric Acid	Liter Amber Organic Washed	Liter Plastic Nitric Acid	Liter Plastic Sodium Hydroxide	Liter Plastic	Liter Plastic Sulfuric Acid	250ml Plastic	125ml Plastic Sterile	250ml Amber	2 oz. Qorpak	ANALYSIS REQUESTED
	~~1/28/02~~				~~water~~	~~ER-MW1~~													
	1/28/02	2:30 PM	X		water	ER-MW2	5	3		2									VOCs + tars 8021B + SVOC 8270
	1/28/02	1:05 PM	X		water	ER-WM3	5	3		2									VOCs + tars 8021B + SVOC 8270

Pd
mL

SAMPLES SUBMITTED FOR ANALYSIS WILL BE SUBJECTED TO THE STL TERMS AND CONDITIONS OF SALE (SHORT FORM) UNLESS ALTERNATE TERMS ARE AGREED IN WRITING.

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
~~Sandra Simchick~~	~~GeoWorx Consulting~~	~~1/28/02~~					
SAMPLED BY: Sandra Simchick	GeoWorx Consulting	1/28/02	3:30				
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY: [illegible]	COMPANY	1/28/02	1573

COMMENTS ____

H2M GROUP

ACEC MEMBER
SUPPORTING EXCELLENCE
IN ENGINEERING

Holzmacher, McLendon & Murrell, P.C. ◣ H2M Associates, Inc.
H2M Labs, Inc. ◣ H2M Construction Management, Inc.
575 Broad Hollow Road, Melville, New York 11747
(631) 756-8000, Fax: (631) 694-4122
e-mail: h2m@h2m.com
web: www.h2m.com

January 31, 2003

Mr. Peter DeCicco
New York State Department of Environmental Conservation
21 South Putt Corners Road
New Paltz, New York 12561-1696

RECEIVED
FEB 3 2003
NYS-DEC
REGION 3-NEW PALTZ

Re: Limited Two Year Monitoring Program Results
June 26, 2002 through January 27, 2003
27 Old State Road
Hopewell Junction, N.Y.
NYSDEC Spill No.: 99-08092 & 99-3503
H2M Project No.: CNAI A1-03

Dear Mr. DeCicco:

As you are aware, Holzmacher, McLendon, and Murrell, P.C. (H2M) has implemented a limited two year monitoring program at the above referenced property. Based upon our discussions at a May 31, 2001 site meeting, our scope of work in conjunction with the limited monitoring program includes the following tasks:

1.) At least one round of groundwater sampling and analyses (accessible monitoring wells only)
2.) Product monitoring and recovery (existing potable water well)
3.) Quarterly water filtration system sampling and analyses (three sampling locations)
4.) Water filtration system maintenance services (as warranted)

H2M has subcontracted with Miller Environmental Group (MEG) of Newburgh, New York to conduct Tasks 1 and 2 and with Hudson Valley Water Resources (Hudson Valley) of New Paltz, N.Y. to conduct Tasks 3 and 4. H2M will be responsible for program administration and liason services between the New York State Department of Environmental Conservation (NYSDEC), our client (Encompass Insurance), and the property owner.

In consideration of the above, MEG measured floating product at the potable water well on June 26, 2002, December 3, 2002, and January 31, 2003. As presented on the attached MEG site visit reports, floating product was non-detectable in each of the three product monitoring events.

H2M GROUP

Should you have any questions or comments, please feel free to contact me directly at (631) 756-8000, Ext. 1484.

Very truly yours,

Holzmacher, McLendon & Murrell, P.C.

Christopher J. Flynn
Project Manager

cc: Belinda Stevenson/Encompass
Jeff Eckes

SITE VISIT REPORT

Groundwater Sampling / Groundwater Remediation System

SPILL # _____
PIN # _____

Date: 6-26-02
Job REPORT # 72915
PC: R. HUGHMAN
Site Name: ECUOS RES.

Time on Site:
From: 0915 am/pm
To: 1000 am/pm

FLOW METER DATA	Time	
Unit	GPM	Totalizer

RECOVERY TANK DATA			
	Total Depth	Inches Water:	Inches Product:
Tank No. 1			
Tank No. 2			

WELL STATUS/PRODUCT THICKNESS/SAMPLING DATA (2" => 0.16, 4" => 0.65)

Well I.D.	Depth to Product (ft.)	Depth to Water (ft.)	Product Thickness (ft.)	Depth to Bottom (ft.)	Well Volume (gal.)	No. Vol's Removed (gal.)	Color		Appearance		Odor		Sheen	
							Start	Sample	Start	Sample	Start	Sample	Start	Sample
	N.D	82.44	N/A											

Weather: CLEAR, 80°F

Samples collected for analysis: ☐ Yes ☒ No Sample No. _____

COMMENTS (Status of panel lights; system operational?; maintenance/repairs performed or needed, etc.)

VERIFIED WELL DATA W/ BAILER

Field Technician Name: F. L. HAINES Field Technician Signature: [signature]

6-26-02 JOB REPORT # 72915
WEATHER - CLEAR, 80°F
F. I. HAINES VEH - 36
ECLES RES.
27 OLD STATE RD
HOPEWELL JCTN., N.Y.
0830 - ENROUTE TO SITE
0915 - ON SITE (TYREE CREW ON SITE SURVEYING WELL CASING ELEVATIONS
1000 - DEPARTING SITE

1. WELL DATA:
DTP - N.D
DTW - 82.44'
THICKNESS - N/A

VERIFIED W/ BAILER

SITE VISIT REPORT

Groundwater Sampling / Groundwater Remediation System

SPILL #
PIN #

Date: 12-3-02

Job REPORT #77058

PC: ~~[illegible]~~ BOB Hulihan

Site Name: Eckes Residence, Howewell, Junc.

Time on Site:
From: 0800 am/pm
To: 11:00 am/pm

FLOW METER DATA	Time	
Unit	GPM	Totalizer

RECOVERY TANK DATA			
	Total Depth	Inches Water:	Inches Product:
Tank No. 1			
Tank No. 2			

WELL STATUS/PRODUCT THICKNESS/SAMPLING DATA (2" => 0.16, 4" => 0.65)

Well I.D.	Depth to Product (ft.)	Depth to Water (ft.)	Product Thickness (ft.)	Depth to Bottom (ft.)	Well Volume (gal.)	No. Vol's Removed (gal.)	Color		Appearance		Odor		Sheen	
							Start	Sample	Start	Sample	Start	Sample	Start	Sample
mw45		88.23												
mw4D		92.21												
mw3		44.19												
mw-2		78.20												
Portable well		84.11												

Weather: Clear 25

Samples collected for analysis: ☐ Yes ☒ No Sample No.

COMMENTS (Status of panel lights; system operational?; maintenance/repairs performed or needed, etc.)

Locate and Gauge wells

note:
1 well mw-3 left a sheen on tape
2 - portable well also left a sheen on tape

Field Technician Name: D. McCarthy

Field Technician Signature: Daniel B McCarthy

Date 12-3-02 Sample #

Job name Eckles Residence

Spill #

P.O #

Job # WB-02-0042

Job Report 77058

Personal D. McCarthy

Veh # 18

weather Clear 25°

P.C Bob Holihan

07:30 Load truck

08:00 Enroute to site

08:45 Arrive on site Locate well under snow. Gauge well

11:00 Departed site

1- well Data Gauge

well	DTP	DTW
MW4S	N/A	88.23
MW4D	N/A	92.21
MW-3	N/A	44.19
MW-2	N/A	78.20
Portable well	N/A	84.1

Note:

1- well MW-3 left a sheen on sonic tape

2- portable well also left a sheen on sonic tape

SITE VISIT REPORT

Groundwater Sampling / Groundwater Remediation System

SPILL #
PIN #

Date: 1-27-03

Job REPORT # 80145

PC: B. Holihan

Site Name: Eckos Residence

Time on Site:

From: _____ am/pm

To: _____ am/pm

FLOW METER DATA	Time	
Unit	GPM	Totalizer

RECOVERY TANK DATA			
	Total Depth	Inches Water:	Inches Product:
Tank No. 1			
Tank No. 2			

WELL STATUS/PRODUCT THICKNESS/SAMPLING DATA (2" => 0.16, 4" => 0.65)

Well I.D.	Depth to Product (ft.)	Depth to Water (ft.)	Product Thickness (ft.)	Depth to Bottom (ft.)	Well Volume (gal.)	No. Vol's Removed (gal.)	Color		Appearance		Odor		Sheen	
							Start	Sample	Start	Sample	Start	Sample	Start	Sample
mw5		86.51												
mw4D		90.87												
mw3		40.63												
mw2		74.85												
Potable		80.29												

Weather: Clear, windy, 25°

Samples collected for analysis: ☐ Yes ☒ No Sample No. _____

COMMENTS (Status of panel lights; system operational?; maintenance/repairs performed or needed, etc.)

Locate and Gauge wells

Field Technician Name: D. McCarthy

Field Technician Signature: Daniel P. McCarthy

Date 1-27-03
Job name Eckes Residence
SP.11#
P.O #
Job# NB-02-0042
Job Report 80145
Personal D. McCarthy
veh 18
weather Clear, windy, 25°
P.C B. Holihan

1230 Arrive on site Locate well under the snow and Gauge them.
14:00 Departed site, Enroute Back to the Shop
15:00 Punch out.

Well Data		Gauge
well	DTW	
mw5	86.51	
mw4D	90.82	
mw3	40.63	
mw2	74.85	
Potable well	80.29	

Attention: SANDRA SIMCHICK
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ANALYTICAL REPORT

JOB NUMBER: 208053

Prepared For:

STL Customer
711 RARITAN AVE
PMB 60
HIGHLAND PARK, NJ 08904

Attention: SANDRA SIMCHICK

Date: 02/06/2002

Signature

Date 2/6/02

Name: Christine M. Shrader

Title: Project Manager

E-Mail: cshrader@stl-inc.com

315 Fullerton Avenue
Newburgh, NY 12550

PHONE: (845) 562-0890
FAX..: (845) 562-0841

SAMPLE INFORMATION
Date: 02/06/2002

Job Number.: 208053
Customer...: STL Customer
Attn.....: SANDRA SIMCHICK

Project Number.....: 99999901
Customer Project ID....: GEOWORX CONSULTING
Project Description....: Walkin Project for Christine Shrader

Laboratory Sample ID	Customer Sample ID	Sample Matrix	Date Sampled	Time Sampled	Date Received	Time Received
208053-1	ER-MW2	Water	01/28/2002	14:30	01/28/2002	15:23
208053-2	ER-MW3	Water	01/28/2002	13:05	01/28/2002	15:23

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LABORATORY TEST RESULTS

Job Number: 208053 Date: 02/06/2002

CUSTOMER: STL Customer PROJECT: GEOWORX CONSULTING ATTN: SANDRA SIMCHICK

Customer Sample ID: ER-MW2
Date Sampled.....: 01/28/2002
Time Sampled.....: 14:30
Sample Matrix.....: Water

Laboratory Sample ID: 208053-1
Date Received.....: 01/28/2002
Time Received.....: 15:23

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
SW846 8270C	Semivolatile Organics							
	Naphthalene	89			53	ug/L	02/01/02	caw
	Acenaphthene	53	U		53	ug/L	02/01/02	caw
	Fluorene	53	U		53	ug/L	02/01/02	caw
	Phenanthrene	380			53	ug/L	02/01/02	caw
	Anthracene	100			53	ug/L	02/01/02	caw
	Fluoranthene	11	J		53	ug/L	02/01/02	caw
	Pyrene	55			53	ug/L	02/01/02	caw
	Benzo(a)anthracene	5.7	J		53	ug/L	02/01/02	caw
	Chrysene	8.2	J		53	ug/L	02/01/02	caw
	Benzo(b)fluoranthene	53	U		53	ug/L	02/01/02	caw
	Benzo(k)fluoranthene	53	U		53	ug/L	02/01/02	caw
	Benzo(a)pyrene	53	U		53	ug/L	02/01/02	caw
	Indeno(1,2,3-cd)pyrene	53	U		53	ug/L	02/01/02	caw
	Dibenzo(a,h)anthracene	53	U		53	ug/L	02/01/02	caw
	Benzo(ghi)perylene	53	U		53	ug/L	02/01/02	caw
SW846 8021B	Volatile Organics							
	Benzene	10	U		10	ug/L	01/29/02	lsh
	Ethylbenzene	10	U		10	ug/L	01/29/02	lsh
	Toluene	10	U		10	ug/L	01/29/02	lsh
	o-Xylene	51			10	ug/L	01/29/02	lsh
	m&p-Xylenes	48			10	ug/L	01/29/02	lsh
	Naphthalene	88			10	ug/L	01/29/02	lsh
	Methyl-tert-butyl-ether (MTBE)	10	U		10	ug/L	01/29/02	lsh
	Isopropylbenzene	10	U		10	ug/L	01/29/02	lsh
	n-Propylbenzene	9.6	J		10	ug/L	01/29/02	lsh
	tert-Butylbenzene	10	U		10	ug/L	01/29/02	lsh
	sec-Butylbenzene	9.5	J		10	ug/L	01/29/02	lsh
	1,3,5-Trimethylbenzene	74			10	ug/L	01/29/02	lsh
	p-Isopropyltoluene	11			10	ug/L	01/29/02	lsh
	1,2,4-Trimethylbenzene	120			10	ug/L	01/29/02	lsh
	n-Butylbenzene	66			10	ug/L	01/29/02	lsh

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 208053 Date: 02/06/2002

CUSTOMER: STL Customer PROJECT: GEOWORX CONSULTING ATTN: SANDRA SIMCHICK

Customer Sample ID: ER-MW3
Date Sampled.....: 01/28/2002
Time Sampled.....: 13:05
Sample Matrix.....: Water

Laboratory Sample ID: 208053-2
Date Received.....: 01/28/2002
Time Received.....: 15:23

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	REPORTING LIMIT	UNITS	ANALYZED	TECH
SW846 8270C	Semivolatile Organics							
	Naphthalene	10	U		10	ug/L	02/01/02	caw
	Acenaphthene	10	U		10	ug/L	02/01/02	caw
	Fluorene	10	U		10	ug/L	02/01/02	caw
	Phenanthrene	10	U		10	ug/L	02/01/02	caw
	Anthracene	10	U		10	ug/L	02/01/02	caw
	Fluoranthene	10	U		10	ug/L	02/01/02	caw
	Pyrene	10	U		10	ug/L	02/01/02	caw
	Benzo(a)anthracene	10	U		10	ug/L	02/01/02	caw
	Chrysene	10	U		10	ug/L	02/01/02	caw
	Benzo(b)fluoranthene	10	U		10	ug/L	02/01/02	caw
	Benzo(k)fluoranthene	10	U		10	ug/L	02/01/02	caw
	Benzo(a)pyrene	10	U		10	ug/L	02/01/02	caw
	Indeno(1,2,3-cd)pyrene	10	U		10	ug/L	02/01/02	caw
	Dibenzo(a,h)anthracene	10	U		10	ug/L	02/01/02	caw
	Benzo(ghi)perylene	10	U		10	ug/L	02/01/02	caw
SW846 8021B	Volatile Organics							
	Benzene	1.0	U		1.0	ug/L	01/29/02	lsh
	Ethylbenzene	1.0	U		1.0	ug/L	01/29/02	lsh
	Toluene	1.0	U		1.0	ug/L	01/29/02	lsh
	o-Xylene	1.0	U		1.0	ug/L	01/29/02	lsh
	m&p-Xylenes	1.0	U		1.0	ug/L	01/29/02	lsh
	Naphthalene	1.0	U		1.0	ug/L	01/29/02	lsh
	Methyl-tert-butyl-ether (MTBE)	1.0	U		1.0	ug/L	01/29/02	lsh
	Isopropylbenzene	1.0	U		1.0	ug/L	01/29/02	lsh
	n-Propylbenzene	1.0	U		1.0	ug/L	01/29/02	lsh
	tert-Butylbenzene	1.0	U		1.0	ug/L	01/29/02	lsh
	sec-Butylbenzene	1.0	U		1.0	ug/L	01/29/02	lsh
	1,3,5-Trimethylbenzene	1.0	U		1.0	ug/L	01/29/02	lsh
	p-Isopropyltoluene	1.0	U		1.0	ug/L	01/29/02	lsh
	1,2,4-Trimethylbenzene	1.0	U		1.0	ug/L	01/29/02	lsh
	n-Butylbenzene	1.0	U		1.0	ug/L	01/29/02	lsh

* In Description = Dry Wgt.

SEVERN TRENT SERVICES

STL Newburgh is a part of Severn Trent Laboratories, Inc.

NYSDOH 10142 NJDEP 73015 CTDOHS PH-0554 EPA NY049 PA 68-378 M-NY049

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 562-0890
Fax (845) 562-0841

LABORATORY CHRONICLE

Job Number: 208053 Date: 02/06/2002

CUSTOMER: STL Customer PROJECT: GEOWORX CONSULTING ATTN: SANDRA SIMCHICK

Lab ID: 208053-1 Client ID: ER-MW2 Date Recvd: 01/28/2002 Sample Date: 01/28/2002

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
SW846 5030	5030 Purge & Trap	1	15812		01/31/2002	1200	
SW846 3510C	Extraction Sep. Funnel (SVOC)	1	15768		01/30/2002	0930	
SW846 8270C	Semivolatile Organics	1	16118		02/01/2002	0000	5.263
SW846 8021B	Volatile Organics	1	15849		01/29/2002	0000	10

Lab ID: 208053-2 Client ID: ER-MW3 Date Recvd: 01/28/2002 Sample Date: 01/28/2002

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
SW846 5030	5030 Purge & Trap	1	15812		01/31/2002	1200	
SW846 3510C	Extraction Sep. Funnel (SVOC)	1	15768		01/30/2002	0930	
SW846 8270C	Semivolatile Organics	1	16118		02/01/2002	0000	1.010
SW846 8021B	Volatile Organics	1	15849		01/29/2002	0000	

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STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 562-0890
Fax (845) 562-0841

The following qualifiers are used to assist in the interpretation of analytical results.

Report Comments

1) All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

2) Soil, sediment and sludge sample results are reported on a "dry weight" basis.

3) Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

Glossary of flags and qualifiers.

Inorganic Qualifiers (Q-Column)

U Indicates that the compound was analyzed for but not detected.
1 Result fails applicable drinking water standards.
2 Exceeds Lead SWDA action level of 15 ug/L.
3 Exceeds Copper SWDA action level of 1.3 mg/L or 1300 ug/L.
4 The results indicate the water to be corrosive.
5 The recommended Sodium level for a moderate diet is 270 mg/L or 270000 ug/L, and for a restricted diet is 20 mg/L or 20000 ug/L.
7 Hardness 0-99 mg/L = soft, 100-200 mg/L = moderately hard, over 200 mg/L = very hard.

Organic Qualifiers (Q-Column)

U Indicates that the compound was analyzed for but not detected.
J Indicates an estimated value. This compound meets the identification criteria, but the result is less than the specified detection limit.
B Indicates that the analyte was found in both the sample and its associated laboratory blank.
D Indicates all compounds identified in an analysis at a secondary dilution factor.
E Indicates that the analyte in an analysis has exceeded the linear calibration range.

Glossary of Terms

Surrogates (Surrogate Standards) - an organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process. For semi-volatiles, volatiles and pesticides/Arochlors, surrogate compounds are added to every blank, sample, matrix sample, matrix spike, matrix sample duplicate, matrix spike blank, and standard. These are used to evaluate analytical efficiency by measuring recovery. Poor surrogate recovery may indicate a problem with the sample composition.

Matrix Spike - an aliquot of a sample (water or soil) fortified (spiked) with known quantities of specific compounds (target analytes) and subjected to the entire analytical procedure in order to indicate the appropriateness of the method for the matrix by measuring recovery. The spiking occurs prior to sample preparation and analysis. Poor spike recovery may indicate a problem with the sample composition.

Internal Standards - an organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process. For GC/MS semi-volatiles and volatiles, internal standards are added to every blank, sample, matrix spike, matrix spike duplicate, matrix spike blank, and standard. Internal standard responses outside of established limits will adversely affect the quantitation and final concentration of target compounds.

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 562-0890
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CHEMTECH

284 Sheffield Street, Mountainside NJ 07092
Tel: 908-789-8900 Fax 908-789-8922

COVER PAGE

ProjectID: Eckes Residence

Order P2208

CustomerName GeoWorx Consulting, LLC

LAB SAMPLE NO.	CLIENT SAMPLE NO
P2208-01	MW-2

I certify that the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the laboratory manager or his designee, as verified by the following signature.

Signature: Plisa Chandwani Name: PLISA Chandwani

Date: 5/1/02 Title: QA/QC

NYDOH CERTIFICATION NO.11376

NJDEP CERTIFICATION NO. 12013

CHEMTECH

CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mou[illegible]nside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH JOB NO.: P2208C

CHEMTECH QUOTE NO.:

CLIENT INFORMATION

REPORT TO BE SENT TO:

COMPANY: GeoWorx Consulting
ADDRESS: 711 Raritan Ave, PMB #60
CITY: Highland Park STATE: NJ ZIP: 08904
ATTENTION: Sandra Simchick
PHONE: 732-650-7186 FAX:

PROJECT INFORMATION

PROJECT NAME: Eckes Residence
PROJECT NO.:
PROJECT MANAGER:
LOCATION: Hopewell Junction NY
PHONE: FAX:

BILLING INFORMATION

BILL TO: Same as project info PO #:
ADDRESS:
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

FAX: 15 DAYS *
HARD COPY: 15 DAYS *
EDD: DAYS *
* TO BE APPROVED BY CHEMTECH
** NORMAL TURNAROUND TIME - 14 DAYS

DATA DELIVERABLE INFORMATION

- ☐ RESULTS ONLY
- ☐ RESULTS PLUS QC
- ☐ REGULATORY FORMAT, STATE:
- ☐ NEW JERSEY REDUCED DELIVERABLES
- ☐ CLP
- ☐ EDD FORMAT:
- ☒ NY STATE CATEGORY A
- ☐ NY STATE CATEGORY B

ANALYSIS

1 VOC Stars 8021B
2 SVOC Stars 8270
3 4 5 6 7 8 9

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	PRESERVATIVES 1 (A,E)	2 (E)	3	4	5	6	7	8	9	COMMENTS ← Specify Preservatives A – HCl B – HNO_3 C – H_2SO_4 D – NaOH E – ICE F – Other
1. 01	ERM MW-2	water		✓	4/15/02	3:00	3	2	1								
2.																	
3.																	
4.																	
5.																	
6.																	
7.																	
8.																	

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. Sandra Simchick	4/15/02 5:40	1. [signature]
RELINQUISHED BY: 2. —	DATE/TIME:	RECEIVED BY: 2. —
RELINQUISHED BY: 3. —	DATE/TIME: 4/16/02 13:45	RECEIVED FOR LAB BY: 3. Sunny Patel

Conditions of bottles or coolers at receipt: ☐ Compliant ☐ Non-Compliant ☐ Temp. of Cooler 7
Comments:

Page 1 of 1

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☐ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☐ YES ☐ NO

WHITE – CHEMTECH COPY FOR RETURN TO CLIENT YELLOW – CHEMTECH COPY PINK – SAMPLER COPY

QC REVIEW GENERAL DOCUMENTATION

Fraction: Voaa Semivoa Project #: P2208

For Lab #s: P2208-01

QA data:

Item	Completed
For thorough review, the report must have the following:	
Sampling documentation – Original Chain of custody, airbill.	✓
Records of communication (telephone, memo, fax).	NA
Cover Page:	
Do numbers of samples correspond to numbers on Chain of custody and on Sample log-in page? – *If "No", contact Project Manager for resolution.*	✓
Do lab numbers and client IDs on cover page agree with sample numbers and client IDs on Form I's? – *If "No", contact Project Manager for resolution.*	✓
Result Tables:	
Do requested analyses on Chain of custody agree with Form I results?	✓
Do requested analyses on Chain of custody agree with sample log-in page?	✓

Non – Conformance / Comments:

1st Level QA Review Signature: Rosa Chemiakowski Date: 5/1/02

2nd Level QA Review Signature: Mildred V Reyes Date: 5/1/02

CHEMTECH

284 Sheffield Street Mountainside NJ 07092
Tel. 908-789-8900 Fax: 908-789-8922

DATA REPORTING QUALIFIERS- ORGANIC

For reporting results, the following " Results Qualifiers" are used:

Value	If the result is a value greater than or equal to the detection limit, report the value
U	Indicates the compound was analyzed for but was not detected. Report the minimum detection limit for the sample with the U, i.e. "10 U". This is not necessarily the instrument detection limit attainable for this particular sample based on any concentration or dilution that may have been required.
J	Indicates an estimated value. This flag is used: (1) When estimating a concentration for a tentatively identified compound (library search hits, where a 1:1 response is assumed.) (2) When the mass spectral data indicated the identification, however the result was less than the specified detection limit greater than zero. If the detection limit was 10ug/L and a concentration of 3 ug/L was calculated report as 3 J. This is flag is used when similar situation arise on any organic parameter i.e. Pest, PCB and others.
B	Indicates the analyte was found in the blank as well as the sample report as "12 B".
E	Indicates the analyte 's concentration exceeds the calibrated range of the instrument for that specific analysis.
D	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
P	This flag is used for Pesticide/PCB target analyte when there is >25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form 1 and flagged with a "P".
N	This flag indicates presumptive evidence of a compound. This is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It applies to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the flag is not used.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

MW-2

Lab Name: CHEMTECH Contract: GEOWORX CONSULTING,

Project No.: P2208 Site: ECKES RE Location: LB20620 Group: 5971-VOA

Matrix: (soil/water) WATER Lab Sample ID: O01

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: VG042612.D

Level: (low/med) Date Received: 4/16/02

% Moisture: not dec. 100 Date Analyzed: 4/26/02

GC Column: RTX624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Concentration Units: (ug/L or ug/Kg) ug/L

CAS No.	Compound		Q
75-71-8	Dichlorodifluoromethane	3.3	U
74-87-3	Chloromethane	2.8	U
75-01-4	Vinyl Chloride	1.8	U
74-83-9	Bromomethane	1.9	U
75-00-3	Chloroethane	2.3	U
75-69-4	Trichlorofluoromethane	1	U
75-35-4	1,1-Dichloroethene	1.6	U
67-64-1	Acetone	5.8	U
75-15-0	Carbon Disulfide	1	U
75-09-2	Methylene Chloride	1.1	U
156-60-5	trans-1,2-Dichloroethene	1.7	U
108-05-4	Vinyl Acetate	6.1	U
75-34-3	1,1-Dichloroethane	1	U
78-93-3	2-Butanone	5.6	U
594-20-7	2,2-Dichloropropane	1.1	U
156-59-2	cis-1,2-Dichloroethene	1.8	U
74-97-5	Bromochloromethane	1.6	U
67-66-3	Chloroform	1	U
71-55-6	1,1,1-Trichloroethane	1.5	U
563-58-6	1,1-Dichloropropene	1.3	U
56-23-5	Carbon Tetrachloride	1	U
71-43-2	Benzene	1.3	
107-06-2	1,2-Dichloroethane	2.5	U
79-01-6	Trichloroethene	2.8	U
78-87-5	1,2-Dichloropropane	3.6	U
74-95-3	Dibromomethane	1	U
75-27-4	Bromodichloromethane	1	U
108-10-1	4-Methyl-2-Pentanone	3	U
108-88-3	Toluene	1.2	U
10061-02-6	t-1,3-Dichloropropene	1.7	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-00-5	1,1,2-Trichloroethane	1.1	U
142-28-9	1,3-Dichloropropane	1	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

MW-2

Lab Name: CHEMTECH Contract: GEOWORX CONSULTING,

Project No.: P2208 Site: ECKES RE Location: LB20620 Group: 5971-VOA

Matrix: (soil/water) WATER Lab Sample ID: O01

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: VG042612.D

Level: (low/med) Date Received: 4/16/02

% Moisture: not dec. 100 Date Analyzed: 4/26/02

GC Column: RTX624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Concentration Units: (ug/L or ug/Kg) ug/L

CAS No.	Compound		Q
110-75-8	2-Chloroethyl vinyl ether	9.6	U
591-78-6	2-Hexanone	12	U
124-48-1	Dibromochloromethane	1	U
106-93-4	1,2-Dibromoethane	1	U
127-18-4	Tetrachloroethene	1.6	U
108-90-7	Chlorobenzene	1	U
630-20-6	1,1,1,2-Tetrachloroethane	1.5	U
100-41-4	Ethyl Benzene	1.5	U
136777-61-2	m/p-Xylenes	1.5	U
95-47-6	o-Xylene	1.7	U
100-42-5	Styrene	1	U
75-25-2	Bromoform	1	U
98-82-8	Isopropylbenzene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	2.2	U
96-18-4	1,2,3-Trichloropropane	2.2	U
108-86-1	Bromobenzene	1	U
103-65-1	n-propylbenzene	1	U
95-49-8	2-Chlorotoluene	1	U
108-67-8	1,3,5-Trimethylbenzene	1	U
106-43-4	4-Chlorotoluene	1	U
98-06-6	tert-Butylbenzene	1	U
95-63-6	1,2,4-Trimethylbenzene	1	U
135-98-8	sec-Butylbenzene	1	U
99-87-6	p-Isopropyltoluene	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
104-51-8	n-Butylbenzene	1	U
95-50-1	1,2-Dichlorobenzene	1	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.1	U
120-82-1	1,2,4-Trichlorobenzene	1	U
87-68-3	Hexachlorobutadiene	1	U
91-20-3	Naphthalene	1.2	
1634-04-4	Methyl tert-butyl Ether	2.9	

VOLATILE ORGANICS ANALYSIS DATA SHEET

MW-2

Lab Name: CHEMTECH Contract: GEOWORX CONSULTING,

Project No.: P2208 Site: ECKES RE Location: LB20620 Group: 5971-VOA

Matrix: (soil/water) WATER Lab Sample ID: O01

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: VG042612.D

Level: (low/med) Date Received: 4/16/02

% Moisture: not dec. 100 Date Analyzed: 4/26/02

GC Column: RTX624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Concentration Units: (ug/L or ug/Kg) ug/L

CAS No.	Compound		Q
75-65-0	Tert butyl alcohol	59	U
107-13-1	Acrylonitrile	7.5	U
107-02-08	Acrolein	43	U
87-61-6	1,2,3-Trichlorobenzene	1.6	U

SVOC-PAH
SW-846

SDG No.: P2208-01

Client: GeoWorx Consulting, LLC

Sample ID:	P2208-01	Client ID:	MW-2
Date Collected:	4/15/02	Date Received:	4/16/02
Date Analyzed:	4/21/02	Matrix:	WATER
Date Extracted:	4/18/02	File ID:	BC000587.D
Dilution:	1	Instrument ID:	5970C
Analytical Method:	8270	Analytical Run ID:	BC042002
Sample Wt/Wol:	980.0	Extract Vol:	1000
Injection Vol:	2	% Moisture:	100
Associated Blank:	PB041802-20B		

Parameter	Concentration	C	RDL	MDL	Units
TARGETS					
Naphthalene	< 1.2	U	10	1.2	ug/L
Acenaphthylene	< 1.2	U	10	1.2	ug/L
Acenaphthene	< 1.2	U	10	1.2	ug/L
Fluorene	< 1.1	U	10	1.1	ug/L
Phenanthrene	< 1.0	U	10	1.0	ug/L
Anthracene	< 1.3	U	10	1.3	ug/L
Fluoranthene	< 1.0	U	10	1.0	ug/L
Pyrene	1.5	J	10	1.0	ug/L
Benzo(a)anthracene	< 1.0	U	10	1.0	ug/L
Chrysene	< 1.6	U	10	1.6	ug/L
Benzo(b)fluoranthene	< 1.0	U	10	1.0	ug/L
Benzo(k)fluoranthene	< 2.7	U	10	2.7	ug/L
Benzo(a)pyrene	< 1.5	U	10	1.5	ug/L
Indeno(1,2,3-cd)pyrene	< 1.6	U	10	1.6	ug/L
Dibenz(a,h)anthracene	< 1.5	U	10	1.5	ug/L
Benzo(g,h,i)perylene	< 1.3	U	10	1.3	ug/L
SURROGATES					
Nitrobenzene-d5	128.17	64 %	35 - 114		SPK: 200
2-Fluorobiphenyl	121.2	61 %	43 - 116		SPK: 200
Terphenyl-d14	111.52	56 %	33 - 141		SPK: 200
INTERNAL STANDARDS					
1,4-Dichlorobenzene-d4	222080	8.51			
Naphthalene-d8	816041	10.79			
Acenaphthene-d10	486757	14.10			
Phenanthrene-d10	802989	16.91			
Chrysene-d12	761963	22.00			
Perylene-d12	603984	26.27			

H2M GROUP

ACEC MEMBER
SUPPORTING EXCELLENCE
IN ENGINEERING

Holzmacher, McLendon & Murrell, P.C. ◣ H2M Associates, Inc.
H2M Labs, Inc. ◣ H2M Construction Management, Inc.
575 Broad Hollow Road, Melville, New York 11747
(631) 756-8000, Fax: (631) 694-4122
e-mail: h2m@h2m.com
web: www.h2m.com

September 23, 2002

Mr. Peter DeCicco
New York State Department of Environmental Conservation
21 South Putt Corners Road
New Paltz, New York 12561-1696

RECEIVED
SEP 25 2002
NYS-DEC
REGION 3-NEW PALTZ

Re: Limited Two Year Monitoring Program Results
August 28, 2002
27 Old State Road
Hopewell Junction, N.Y.
NYSDEC Spill No.: 99-08092 & 99-3503
H2M Project No.: CNAI A1-03

Dear Mr. DeCicco:

As you are aware, Holzmacher, McLendon, and Murrell, P.C. (H2M) has implemented a limited two year monitoring program at the above referenced property. Based upon our discussions at a May 31, 2001 site meeting, our scope of work in conjunction with the limited monitoring program includes the following tasks:

1.) At least one round of groundwater sampling and analyses (accessible monitoring wells only)
2.) Product monitoring and recovery (existing potable water well)
3.) Quarterly water filtration system sampling and analyses (three sampling locations)
4.) Water filtration system maintenance services (as warranted)

H2M has subcontracted with Miller Environmental Group (MEG) of Newburgh, New York to conduct Tasks 1 and 2 and with Hudson Valley Water Resources (Hudson Valley) of New Paltz, N.Y. to conduct Tasks 3 and 4. H2M will be responsible for program administration and liason services between the New York State Department of Environmental Conservation (NYSDEC), our client (Encompass Insurance), and the property owner.

In consideration of the above, Hudson Valley conducted a round of water filtration system sampling on August 28, 2002. Potable water samples were collected at the influent location (i.e. raw water), after the first carbon unit, and after the second carbon unit. Each of the potable water samples were analyzed for volatile organic compounds

H2M GROUP

and MTBE (EPA Method 502.2) by York Analytical Laboratories, Inc. (NYSDOH ID No. 10854). As presented on the attached laboratory reports, the analyses indicate non-detectable concentrations for all compounds at each of the three water filtration system locations.

In summary, the results of the laboratory analyses indicate that the water filtration system continues to be effective with respect to maintaining a potable water supply for the residents.

Should you have any questions or comments, please feel free to contact me directly at (631) 756-8000, Ext. 1484.

Very truly yours,

Holzmacher, McLendon & Murrell, P.C.

Christopher J. Flynn
Project Manager

cc: Belinda Stevenson/Encompass
Jeff Eckes/27 Old State Road

YORK
ANALYTICAL LABORATORIES, INC.

Technical Report

prepared for

Hudson Valley Water Resources
11 North Ohioville Road
New Paltz, NY 12561
Attention: Wendy Sanicola

Report Date: 9/3/2002
Re: Client Project ID: Eckes
York Project No.: 02080715

CT License No. PH-0723 New York License No. 10854 Mass. License No. M-CT106 Rhode Island License No. 93 EPA I.D. No. CT00106

ONE RESEARCH DRIVE STAMFORD, CT 06906 (203) 325-1371 FAX (203) 357-0166

Report Date: 9/3/2002
Client Project ID: Eckes
York Project No.: 02080715

Hudson Valley Water Resources
11 North Ohioville Road
New Paltz, NY 12561
Attention: Wendy Sanicola

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on 08/28/02. The project was identifed as your project "Eckes ".

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables .

All samples were received in proper condition meeting the NELAC acceptance requirements for environmental samples except those indicated under the Notes section of this report.

All the analyses met the method and laboratory standard operating procedure requirements except as indicated under the Notes section of this report, or as indicated by any data flags, the meaning of which is explained in the attachment to this report, if applicable.

The results of the analyses, which are all reported on an as-received basis unless otherwise noted, are summarized in the following table(s).

Analysis Results

Client Sample ID			Before		Middle	
York Sample ID			02080715-01		02080715-02	
Matrix			WATER		WATER	
Parameter	Method	Units	Results	MDL	Results	MDL
Volatiles 502.2 List water	EPA 502.2	ug/L	---	---	---	---
1,1,1,2-Tetrachloroethane			Not detected	0.5	Not detected	0.5
1,1,1-Trichloroethane			Not detected	0.5	Not detected	0.5
1,1,2,2-Tetrachloroethane			Not detected	0.5	Not detected	0.5
1,1,2-Trichloroethane			Not detected	0.5	Not detected	0.5
1,1-Dichloroethane			Not detected	0.5	Not detected	0.5
1,1-Dichloroethylene			Not detected	0.5	Not detected	0.5
1,1-Dichloropropylene			Not detected	0.5	Not detected	0.5
1,2,3-Trichlorobenzene			Not detected	0.5	Not detected	0.5
1,2,3-Trichloropropane			Not detected	0.5	Not detected	0.5
1,2,3-Trimethylbenzene			Not detected	0.5	Not detected	0.5
1,2,4-Trichlorobenzene			Not detected	0.5	Not detected	0.5
1,2,4-Trimethylbenzene			Not detected	0.5	Not detected	0.5
1,2-Dibromo-3-chloropropane			Not detected	0.5	Not detected	0.5
1,2-Dibromoethane			Not detected	0.5	Not detected	0.5
1,2-Dichlorobenzene			Not detected	0.5	Not detected	0.5
1,2-Dichloroethane			Not detected	0.5	Not detected	0.5

YORK

Client Sample ID			Before		Middle	
York Sample ID			02080715-01		02080715-02	
Matrix			WATER		WATER	
Parameter	Method	Units	Results	MDL	Results	MDL
1,2-Dichloroethylene (Total)			Not detected	0.5	Not detected	0.5
1,2-Dichloropropane			Not detected	0.5	Not detected	0.5
1,3,5-Trimethylbenzene			Not detected	0.5	Not detected	0.5
1,3-Dichlorobenzene			Not detected	0.5	Not detected	0.5
1,3-Dichloropropane			Not detected	0.5	Not detected	0.5
1,3-Dichloropropylene			Not detected	0.5	Not detected	0.5
1,4-Dichlorobenzene			Not detected	0.5	Not detected	0.5
2,2-Dichloropropane			Not detected	0.5	Not detected	0.5
2-Chlorotoluene			Not detected	0.5	Not detected	0.5
4-Chlorotoluene			Not detected	0.5	Not detected	0.5
Benzene			Not detected	0.5	Not detected	0.5
Bromobenzene			Not detected	0.5	Not detected	0.5
Bromochloromethane			Not detected	0.5	Not detected	0.5
Bromodichloromethane			Not detected	0.5	Not detected	0.5
Bromoform			Not detected	0.5	Not detected	0.5
Bromomethane			Not detected	0.5	Not detected	0.5
Carbon tetrachloride			Not detected	0.5	Not detected	0.5
Chlorobenzene			Not detected	0.5	Not detected	0.5
Chloroethane			Not detected	0.5	Not detected	0.5
Chloroform			Not detected	0.5	Not detected	0.5
Chloromethane			Not detected	0.5	Not detected	0.5
Dibromochloromethane			Not detected	0.5	Not detected	0.5
Dibromomethane			Not detected	0.5	Not detected	0.5
Dichlorodifluoromethane			Not detected	0.5	Not detected	0.5
Ethylbenzene			Not detected	0.5	Not detected	0.5
Hexachlorobutadiene			Not detected	0.5	Not detected	0.5
Isopropylbenzene			Not detected	0.5	Not detected	0.5
Methylene chloride			Not detected	0.5	Not detected	0.5
MTBE			Not detected	1.0	Not detected	1.0
Naphthalene			Not detected	0.5	Not detected	0.5
n-Butylbenzene			Not detected	0.5	Not detected	0.5
n-Propylbenzene			Not detected	0.5	Not detected	0.5
o-Xylene			Not detected	0.5	Not detected	0.5
p- & m-Xylenes			Not detected	0.5	Not detected	0.5
p-Isopropyltoluene			Not detected	0.5	Not detected	0.5
sec-Butylbenzene			Not detected	0.5	Not detected	0.5
Styrene			Not detected	0.5	Not detected	0.5
tert-Butylbenzene			Not detected	0.5	Not detected	0.5
Tetrachloroethylene			Not detected	0.5	Not detected	0.5
Toluene			Not detected	0.5	Not detected	0.5
Trichloroethylene			Not detected	0.5	Not detected	0.5
Trichlorofluoromethane			Not detected	0.5	Not detected	0.5
Vinyl chloride			Not detected	0.5	Not detected	0.5

YORK

Client Sample ID			After	
York Sample ID			02080715-03	
Matrix			WATER	
Parameter	Method	Units	Results	MDL
Volatiles 502.2 List water	EPA 502.2	ug/L	---	---
1,1,1,2-Tetrachloroethane			Not detected	0.5
1,1,1-Trichloroethane			Not detected	0.5
1,1,2,2-Tetrachloroethane			Not detected	0.5
1,1,2-Trichloroethane			Not detected	0.5
1,1-Dichloroethane			Not detected	0.5
1,1-Dichloroethylene			Not detected	0.5
1,1-Dichloropropylene			Not detected	0.5
1,2,3-Trichlorobenzene			Not detected	0.5
1,2,3-Trichloropropane			Not detected	0.5
1,2,3-Trimethylbenzene			Not detected	0.5
1,2,4-Trichlorobenzene			Not detected	0.5
1,2,4-Trimethylbenzene			Not detected	0.5
1,2-Dibromo-3-chloropropane			Not detected	0.5
1,2-Dibromoethane			Not detected	0.5
1,2-Dichlorobenzene			Not detected	0.5
1,2-Dichloroethane			Not detected	0.5
1,2-Dichloroethylene (Total)			Not detected	0.5
1,2-Dichloropropane			Not detected	0.5
1,3,5-Trimethylbenzene			Not detected	0.5
1,3-Dichlorobenzene			Not detected	0.5
1,3-Dichloropropane			Not detected	0.5
1,3-Dichloropropylene			Not detected	0.5
1,4-Dichlorobenzene			Not detected	0.5
2,2-Dichloropropane			Not detected	0.5
2-Chlorotoluene			Not detected	0.5
4-Chlorotoluene			Not detected	0.5
Benzene			Not detected	0.5
Bromobenzene			Not detected	0.5
Bromochloromethane			Not detected	0.5
Bromodichloromethane			Not detected	0.5
Bromoform			Not detected	0.5
Bromomethane			Not detected	0.5
Carbon tetrachloride			Not detected	0.5
Chlorobenzene			Not detected	0.5
Chloroethane			Not detected	0.5
Chloroform			Not detected	0.5
Chloromethane			Not detected	0.5
Dibromochloromethane			Not detected	0.5
Dibromomethane			Not detected	0.5
Dichlorodifluoromethane			Not detected	0.5
Ethylbenzene			Not detected	0.5
Hexachlorobutadiene			Not detected	0.5
Isopropylbenzene			Not detected	0.5
Methylene chloride			Not detected	0.5
MTBE			Not detected	1.0
Naphthalene			Not detected	0.5
n-Butylbenzene			Not detected	0.5
n-Propylbenzene			Not detected	0.5
o-Xylene			Not detected	0.5
p- & m-Xylenes			Not detected	0.5

YORK

Client Sample ID			After	
York Sample ID			02080715-03	
Matrix			WATER	
Parameter	Method	Units	Results	MDL
p-Isopropyltoluene			Not detected	0.5
sec-Butylbenzene			Not detected	0.5
Styrene			Not detected	0.5
tert-Butylbenzene			Not detected	0.5
Tetrachloroethylene			Not detected	0.5
Toluene			Not detected	0.5
Trichloroethylene			Not detected	0.5
Trichlorofluoromethane			Not detected	0.5
Vinyl chloride			Not detected	0.5

Units Key: For Waters/Liquids: mg/L = ppm ; ug/L = ppb For Soils/Solids: mg/kg = ppm ; ug/kg = ppb

Notes for York Project No. 02080715

1. The MDL (Minimum Detectable Limit) reported is adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All samples were received in proper condition for analysis with proper documentation.
6. All analyses conducted met method or Laboratory SOP requirements.
7. It is noted that no analyses reported herein were subcontracted to another laboratory.

Approved By: Robert Q. Bradley
Managing Director

Date: 9/3/2002

YORK

H2M GROUP

ACEC MEMBER
SUPPORTING EXCELLENCE
IN ENGINEERING

Holzmacher, McLendon & Murrell, P.C. ◣ H2M Associates, Inc.
H2M Labs, Inc. ◣ H2M Construction Management, Inc.
575 Broad Hollow Road, Melville, New York 11747
(631) 756-8000, Fax: (631) 694-4122
e-mail: h2m@h2m.com
web: www.h2m.com

January 31, 2003

Mr. Peter DeCicco
New York State Department of Environmental Conservation
21 South Putt Corners Road
New Paltz, New York 12561-1696

RECEIVED
FEB 3 2003
NYS-DEC
REGION 3-NEW PALTZ

Re: Limited Two Year Monitoring Program Results
June 26, 2002 through January 27, 2003
27 Old State Road
Hopewell Junction, N.Y.
NYSDEC Spill No.: 99-08092 & 99-3503
H2M Project No.: CNAI A1-03

Dear Mr. DeCicco:

As you are aware, Holzmacher, McLendon, and Murrell, P.C. (H2M) has implemented a limited two year monitoring program at the above referenced property. Based upon our discussions at a May 31, 2001 site meeting, our scope of work in conjunction with the limited monitoring program includes the following tasks:

1.) At least one round of groundwater sampling and analyses (accessible monitoring wells only)
2.) Product monitoring and recovery (existing potable water well)
3.) Quarterly water filtration system sampling and analyses (three sampling locations)
4.) Water filtration system maintenance services (as warranted)

H2M has subcontracted with Miller Environmental Group (MEG) of Newburgh, New York to conduct Tasks 1 and 2 and with Hudson Valley Water Resources (Hudson Valley) of New Paltz, N.Y. to conduct Tasks 3 and 4. H2M will be responsible for program administration and liason services between the New York State Department of Environmental Conservation (NYSDEC), our client (Encompass Insurance), and the property owner.

In consideration of the above, MEG measured floating product at the potable water well on June 26, 2002, December 3, 2002, and January 31, 2003. As presented on the attached MEG site visit reports, floating product was non-detectable in each of the three product monitoring events.

H2MGROUP

Should you have any questions or comments, please feel free to contact me directly at (631) 756-8000, Ext. 1484.

Very truly yours,

Holzmacher, McLendon & Murrell, P.C.

Christopher J. Flynn
Project Manager

cc: Belinda Stevenson/Encompass
Jeff Eckes

SITE VISIT REPORT

Groundwater Sampling / Groundwater Remediation System

SPILL # _____
PIN # _____

Date: 6-26-02
Job REPORT # 72915
PC: R. HUCHMAN
Site Name: ECUOS RES.

FLOW METER DATA	Time	
Unit	GPM	Totalizer

Time on Site:
From: 0915 am/pm
To: 1000 am/pm

RECOVERY TANK DATA			
	Total Depth.	Inches Water:	Inches Product:
Tank No. 1			
Tank No. 2			

WELL STATUS/PRODUCT THICKNESS/SAMPLING DATA (2" => 0.16, 4" => 0.65)

Well I.D.	Depth to Product (ft.)	Depth to Water (ft.)	Product Thickness (ft.)	Depth to Bottom (ft.)	Well Volume (gal.)	No. Vol's Removed (gal.)	Color		Appearance		Odor		Sheen	
							Start	Sample	Start	Sample	Start	Sample	Start	Sample
	N.D	82.44	N/A											

Weather: CLEAR, 80°F

Samples collected for analysis: ☐ Yes ☒ No Sample No. _____

COMMENTS (Status of panel lights; system operational?; maintenance/repairs performed or needed, etc.)

VERIFIED WELL DATA W/ BAILER

Field Technician Name: F. I. HAINES Field Technician Signature: [signature]

6-26-02 JOB REPORT # 72915
WEATHER - CLEAR, 80°F
F. I. HAINES VEH - 36
ECLES RES.
27 OLD STATE RD
HOPEWELL JCTN., N.Y.
0830 - ENROUTE TO SITE
0915 - ON SITE (TYREE CREW ON
SITE SURVEYING WELL CASING
ELEVATIONS
1000 - DEPARTING SITE

1. WELL DATA:
DTP - N.D
DTW - 82.44'
THICKNESS - N/A

VERIFIED W/ BAILER

SITE VISIT REPORT

Groundwater Sampling / Groundwater Remediation System

SPILL #
PIN #

Date: 12-3-02

Job REPORT # 77058

PC: BOB Holihan

Site Name: Eckes Residence, Howewell, Inc.

Time on Site:
From: 0800 am/pm
To: 11:00 am/pm

FLOW METER DATA	Time	
Unit	GPM	Totalizer

RECOVERY TANK DATA			
	Total Depth	Inches Water:	Inches Product:
Tank No. 1			
Tank No. 2			

WELL STATUS/PRODUCT THICKNESS/SAMPLING DATA (2" => 0.16, 4" => 0.65)

Well I.D.	Depth to Product (ft.)	Depth to Water (ft.)	Product Thickness (ft.)	Depth to Bottom (ft.)	Well Volume (gal.)	No. Vol's Removed (gal.)	Color		Appearance		Odor		Sheen	
							Start	Sample	Start	Sample	Start	Sample	Start	Sample
MW-4S		88.23												
MW-4D		92.21												
MW-3		44.19												
MW-2		78.20												
Portable well		84.11												

Weather: Clear 26

Samples collected for analysis: ☐ Yes ☒ No Sample No.

COMMENTS (Status of panel lights; system operational?; maintenance/repairs performed or needed, etc.)

Locate and Gauge wells

note:
1 well MW-3 left a sheen on tape
2- portable well also left a sheen on tape

Field Technician Name: D. McCarthy

Field Technician Signature: Daniel B McCarthy

Date 12-3-02 Sample #

Job name Eckles Residence

Spill #

P.O #

Job # WB-02-0042

Job Report 77058

Personal D. McCarthy

Veh # 18

weather Clear 25°

P.C Bob Holihan

07:30 Load truck

08:00 Enroute to site

08:45 Arrive on site Locate well under snow. Gauge well

11:00 Departed site

1- well Data Gauge

well	DTP	DTW
mw-4S	N/A	88.23
mw-4D	N/A	92.21
mw-3	N/A	44.19
mw-2	N/A	78.20
Portable well	N/A	84.1

note:

1- well mw-3 left a sheen on sonic tape

1- Portable well also left a sheen on sonic tape

SITE VISIT REPORT

Groundwater Sampling / Groundwater Remediation System

SPILL #
PIN #

Date: 1-27-03

Job REPORT #80145

PC: B. Holiman

Site Name: Eckes Residence

Time on Site:

From: _____ am/pm

To: _____ am/pm

FLOW METER DATA	Time	
Unit	GPM	Totalizer

RECOVERY TANK DATA			
	Total Depth	Inches Water:	Inches Product:
Tank No. 1			
Tank No. 2			

WELL STATUS/PRODUCT THICKNESS/SAMPLING DATA (2" => 0.16, 4" => 0.65)

Well I.D.	Depth to Product (ft.)	Depth to Water (ft.)	Product Thickness (ft.)	Depth to Bottom (ft.)	Well Volume (gal.)	No. Vol's Removed (gal.)	Color		Appearance		Odor		Sheen	
							Start	Sample	Start	Sample	Start	Sample	Start	Sample
mw4S		86.51												
mw4D		90.87												
mw-3		40.63												
mw-2		74.85												
Potable well		80.29												

Weather: Clear, windy, 25°

Samples collected for analysis: ☐ Yes ☒ No Sample No. _____

COMMENTS (Status of panel lights; system operational?; maintenance/repairs performed or needed, etc.)

Locate and Gauge wells

Field Technician Name: D. McCarthy

Field Technician Signature: Daniel P. McCarthy

Date 1-27-03
Job name Eckes Residence
SP.11#
Pin #
Job# NB-02-0042
Job Report 80145
Personal D. McCarthy
veh 18
weather Clear, windy, 25°
P.C B. Holihan

1230 Arrive on site Locate well under the snow and Gaug them.
14:00 Departed site, Enroute Back to the shop
15:00 Punch out.

1. well Data Gauge

well	DTW
mw4S	86.51
mw4D	90.87
mw3	40.63
mw2	74.85
Portable well	80.29

APPENDIX D

DOCUMENTATION FOR ALTERNATE WATER SUPPLY RESPONSE SCOPE

D-1: Site Well Logs and Groundwater Elevation Data
C-2: Water Quality Data

APPENDIX D-1

Site Well Logs and Groundwater Elevation Data

GROUNDWATER SCIENCES CORPORATION

GEOLOGICLOG: SRMW-7R

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*

SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*

JOB NO.: *01003.11.0105*

LOGGED BY: *E. Stoner/ S. Fisher*

DATES DRILLED: *3/07/03 - 3/12/03*

DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*

DRILLER: *J. Books*

RIG TYPE: *IR T4W*

DRILLING METHOD: *Air Rotary*

DEVELOPMENT DATE: *3/12/03*

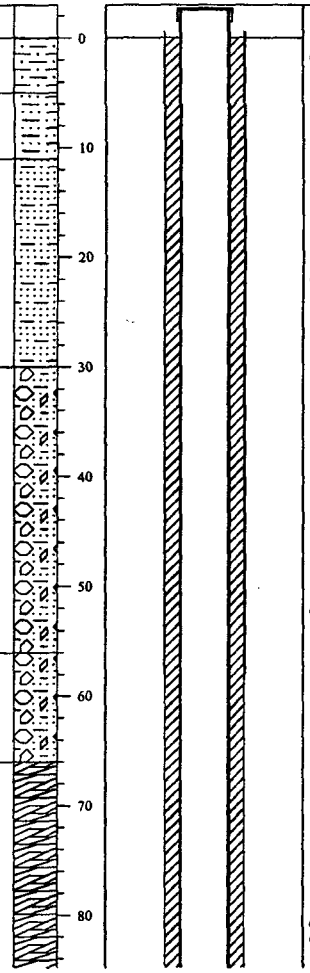
LOCATION: *East of Patti Place, on J. Greico property*

NOTES: SWL= 0.5' below casing rim, 3/13/03 (artesian)
Well completed as a 6"dia. open borehole
150+ gpm blown yield

ELEVATION: 331.14 ft amsl

NORTHING: 980071.61 EASTING: 688067.48

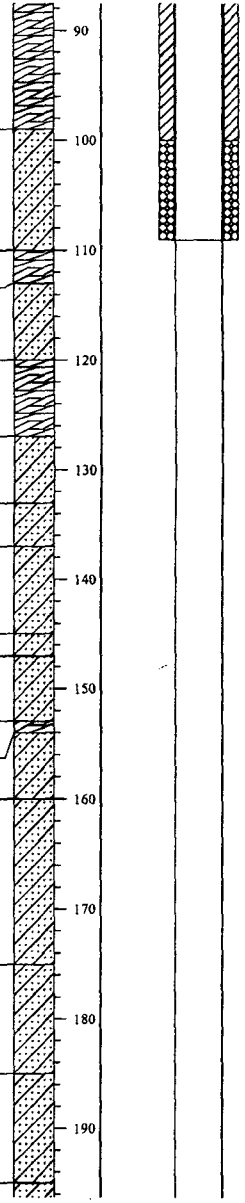
DEPTH FEET	CUM. BLOWN YIELD	SAMP. #	LITHOLOGY	WELL CONSTRUCTION DETAILS
0			SILT: dark yellowish brown (10 YR 4/2) organic-rich silt, some clay, moist	6" locking well cap
			SANDY SILT: light brown (5 YR 5/6) silt, some clay and sand, moist	
10			SAND & SILT: olive gray (5 Y 4/1) silt & sand, some clay, trace f-m gravel, firm silt at 19'	
20				Bentonite slurry annular seal, 0' to 100'
30			SILT, SAND & GRAVEL: lt. olive gray (5 Y 6/1) silt and vf-vc sand matrix, with abundant A-SR dolostone gravel, cobbly, poorly sorted	
40				
50				10" dia. steel casing with driveshoe, 0' to 58'
60			SILT, SAND & GRAVEL: dusky yellowish brown (5 Y 6/4) matrix with predominantly dk gray to med gray A-SR dolostone frags, w/ pebbles and cobbles of various lithologies, occ. R pebble, occ. boulder	
70			WEATHERED QUARTZITE: yellowish gray (5 Y 7/2) to pale yellowish orange (10 YR 8/6) f-m grained quartzite, with abundant iron and manganese stained fractures, occ. highly fractured zones, water-bearing	
80				6" dia.steel casing with driveshoe, +2.5' to 109'



GROUNDWATER SCIENCES CORPORATION

GEOLOGICLOG: SRMW-7R

DEPTH FEET	BLOWN YIELD (GPM)	SAMP. #	LITHOLOGY	WELL CONSTRUCTION DETAILS
90				
100			QUARTZITE: more competent, fine grained, more yellowish gray w/ some grayish orange, occ. iron-stained fractures	Bentonite pellet annular seal, 100' to 109'
110	1 gpm		WEATHERED QUARTZITE: soft, broken, increase in iron-staining	
			QUARTZITE: competent, grayish yellow to grayish orange	
120			WEATHERED QUARTZITE: soft, broken, abundant iron-stained fractures, limonitic	
	10 gpm		QUARTZITE: competent, some iron staining	
130			QUARTZITE: dark yellowish orange (10 YR 6/6) vitreous, competent, tr limonite	
140			QUARTZITE: yellowish gray, competent, some iron-staining	
			QUARTZITE: increased iron-stained fractures	
150			QUARTZITE: yellowish gray (5 Y 7/2) to lt olive gray (5 Y 6/1), homogeneous, little iron-staining	6" dia. open borehole
	20 gpm		WEATHERED QUARTZITE: soft, broken zone, water-bearing	
			QUARTZITE: yellowish gray with increased iron-staining	
160			QUARTZITE: cleaner, yellowish gray, some iron-staining	
170				
	30 gpm		QUARTZITE: yellowish gray, some lt gray (N7) w/ iron-stained fractures	
180				
			QUARTZITE: lt gray to yellowish gray, some yellowish orange mottling, w/ iron-stained fractures, tr yellowish gray phyllite laminations	
190				
			QUARTZITE: hard, yellowish gray to grayish orange	



GROUNDWATER SCIENCES CORPORATION

GEOLOGICLOG: SRMW-7R

DEPTH FEET	BLOWN YIELD (GPM)	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
200	50 gpm		WEATHERED QUARTZITE: yellowish gray, fractured, limonitic, water-bearing QUARTZITE: yellowish gray, competent		200		
210			QUARTZITE: yellowish gray, with dark gray (N3) to med dk gray (N5) phyllite stringers, abundant iron-staining, tr quartz veining, some med lt gray (N6) quartzite		210		
220	50 gpm				220		6" dia. open borehole
230			WEATHERED QUARTZITE: soft, broken, water-bearing QUARTZITE: yellowish gray to lt gray, iron-stained, tr white quartz		230		
240			WEATHERED QUARTZITE: softer, increased iron-staining, some dk yellowish orange silt, water-bearing QUARTZITE: pred yellowish gray, with dark gray phyllite stringers, phyllite-rich around 250'		240		
250	75 gpm		WEATHERED QUARTZITE: soft, broken, phyllitic, w/ abundant iron-staining, water-bearing		250		
260			QUARTZITE: yellowish gray, competent, cleaner, tr iron-staining		260		
270			QUARTZITE: yellowish gray, competent with increased iron-staining, some iron-stained phyllite		270		
280	100 gpm		QUARTZITE: yellowish gray, competent, with occ. soft zones, tr phyllite, frequent iron-stained fractures		280		
290					290		
300	>150 gpm				300		

GROUNDWATER SCIENCES CORPORATION

GEOLOGIC LOG: SRMW-7S

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.11.0105*
LOGGED BY: *S. Fisher*
DATES DRILLED: *3/12/03 - 3/13/03*

NOTES: SWL= 8.5' below casing rim, 3/14/03
Well completed as a 2"dia. piezometer

DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *J. Books*
RIG TYPE: *IR T4W*
DRILLING METHOD: *Air Rotary*
DEVELOPMENT DATE: *3/19/03 - 3/20/03*
LOCATION: *10 ft east of SRMW-7R on J. Greico property*

ELEVATION: 332.30 ft amsl
NORTHING: 980075.19 EASTING: 688078.27

DEPTH FEET	CUM. BLOWN YIELD	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
0			SILT: dark yellowish brown (10 YR 4/2) organic-rich silt, some clay, moist		0		6" locking well cap
			SANDY SILT: light brown (5 YR 5/6) silt, some clay and sand, moist				
10			SAND & SILT: olive gray (5 Y 4/1) silt & sand, some clay, trace f-m gravel, firm silt at 19'		10		2" sch. 40 PVC riser pipe, 2' to 47'
20					20		Bentonite slurry annular seal, 0' to 43'
30			SILT, SAND & GRAVEL: lt. olive gray (5 Y 6/1) silt and vf-vc sand matrix, with abundant A-SR dolostone gravel, cobbly, poorly sorted		30		6" dia.steel casing with driveshoe, +2.5' to 43'
40					40		Bentonite chip annular seal, 43' to 45'
50					50		#0 sand, 45' to 65'
60			SILT, SAND & GRAVEL: dusky yellowish brown (5 Y 6/4) matrix with predominantly dk gray to med gray A-SR dolostone frags, w/ pebbles and cobbles of various lithologies, occ. R pebble, occ. boulder		60		2" dia. 10-slot PVC screen, 47' to 65'
			WEATHERED QUARTZITE: yellowish gray (5 Y 7/2) to pale yellowish orange (10 YR 8/6) f-m grained quartzite, with abundant iron and manganese stained fractures				collapsed formation, 65' to 66'
70					70		

PROJECT INFORMATION

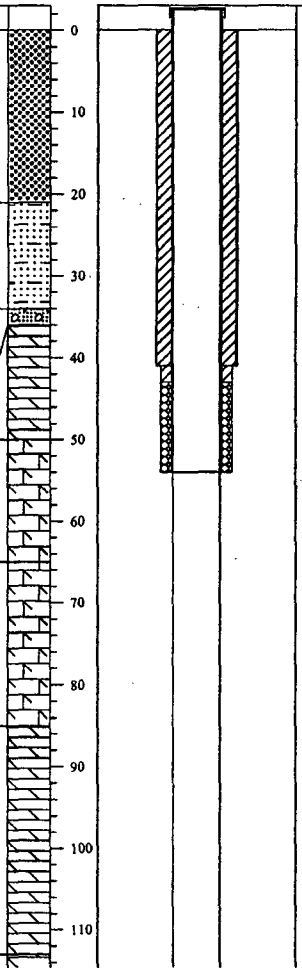
PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.11.0105*
LOGGED BY: *E. Stoner*
DATES DRILLED: *1/29/03 - 1/30/03*

DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *C. Brenneman*
RIG TYPE: *Schramm*
DRILLING METHOD: *Air Rotary*
DEVELOPMENT DATE: ---
LOCATION: *West of Jackson Road, E. of SRMW-2R*
ELEVATION: Approx. 380 ft amsl
NORTHING: --- EASTING: ---

NOTES: SWL= 49.50' below casing rim, 1/31/03
Well completed as a 6"dia. open borehole
40 gpm blown yield

DEPTH FEET	CUM. BLOWN YIELD	SAMP. #	LITHOLOGY	WELL CONSTRUCTION DETAILS
0			SAND: dark yellowish brown, f-m, some vf, trace vc and f gravel, tr. clay, thin gravel layers at 11', 14', & 19', moist	6" locking well cap
10				10" dia. steel casing with driveshoe, 0' to 41'
20			SAND & SILT: vf sand & silt,some f-m sand, tr. clay, more silt and clay below 30', moist	Bentonite slurry annular seal, 0' to 43'
30				6" dia.steel casing with driveshoe, +2.5' to 54'
			SAND & GRAVEL: sand with SA-SR gravel, predominantly dolostone with some quartzite and gneiss	
40			DOLOSTONE: med bluish gray (5 B 5/1), with occasional thin laminations of white (N9) dolostone below 47'	9" dia. borehole, 41' to 54'
50			DOLOMITIC LIMESTONE: dark gray (N3) to grayish black (N2), with occasional laminations of white dolostone, translucent quartz vein at 50'	Bentonite chip annular seal, 43' to 54'
60	0 gpm			
70			DOLOMITIC LIMESTONE: dark gray to grayish black	
80	0 gpm			
90			DOLOSTONE: grayish black, occasional laminations of white dolostone 85' to 95', pyritic and shaly 89' to 90' with quartz veins	
100	0 gpm			
110			DOLOSTONE: med dark gray (N4) to med bluish	



DEPTH FEET	BLOWN YIELD (GPM)	SAMP. #	LITHOLOGY	WELL CONSTRUCTION DETAILS
120	0 gpm			
130				
140	<0.5 gpm			6" dia. open borehole
150			DOLOSTONE: medium gray, soft at 154'	
			DOLOSTONE: interbedded med light gray (N6) and dark greenish gray (5 G 4/1), hard	
160	<0.5 gpm		SHALY DOLOSTONE: med gray (N5) dolostone with layers of greenish gray (5 GY 6/1) shale	
170				
			DOLOSTONE: med gray to med bluish gray, shaly 175' to 176', pyrite vein at 180'	
180	<0.5 gpm			
			DOLOSTONE: med gray to med light gray, calcareous	
190			DOLOSTONE: med dark gray, trace of white to translucent dolostone	
			DOLOSTONE: med light gray	
			DOLOSTONE: interbedded med light gray to light gray (N7) with med gray shaly layers	
200	<0.5 gpm			
210			DOLOSTONE: light gray to very light gray (N8), calcareous	
			DOLOSTONE: med light gray to med gray, calcareous	
220	<0.5 gpm			
230			DOLOSTONE: med dark gray, shaly	
240	<0.5 gpm		DOLOSTONE: med gray to med light gray, with greenish gray and very light gray layers at 260', tr pyrite, calcareous	
250				
260	<0.5 gpm		DOLOSTONE: med light gray to medium gray, tr	

GROUNDWATER SCIENCES CORPORATION

GEOLOGICLOG: SRMW-8R

DEPTH FEET	BLOWN YIELD (GPM)	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
270					270		
280	<0.5 gpm		DOLOSTONE: med dark gray		280		
290					290		
300	<0.5 gpm		DOLOSTONE: dark gray to med dark gray, some coarse crystalline light gray bands, some pyrite encrusted layers		300		6" dia. open borehole
310					310		
320	<0.5 gpm		DOLOMITIC SHALE: occasional coarse crystalline dolostone, occasional pyritic zones		320		
330			FRACTURED DOLOSTONE: broken, water-bearing DOLOMITIC SHALE: occasional coarse crystalline dolostone, occasional pyritic zones FRACTURED DOLOSTONE: broken, water-bearing		330		
340	40 gpm		DOLOMITIC SHALE: occasional coarse crystalline dolostone, occasional pyritic zones, thin fractures at 352' and 356'		340		
350					350		
360	40 gpm				360		
370					370		
380	40 gpm				380		
390					390		
400	40 gpm				400		Total depth: 401 ft

GROUNDWATER SCIENCES CORPORATION

GEOLOGICLOG: SRMW-9R

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*

SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*

JOB NO.: *01003.11.0105*

LOGGED BY: *E. Stoner*

DATES DRILLED: *1/9/03 - 1/14/03*

DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*

DRILLER: *C. Brenneman*

RIG TYPE: *Schramm*

DRILLING METHOD: *Air Rotary*

DEVELOPMENT DATE: ---

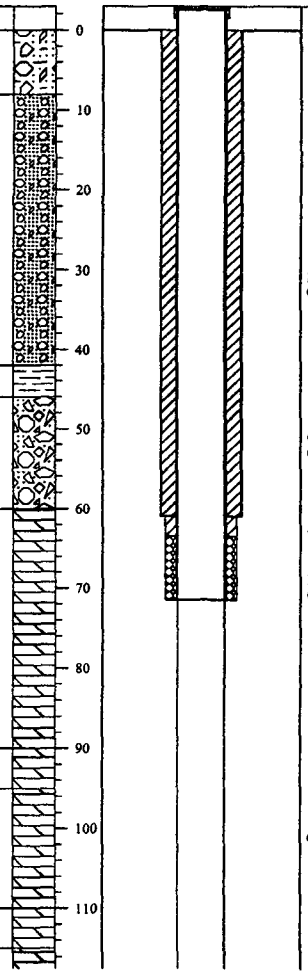
LOCATION: *East of Jackson Road, S. of SRMW-2R*

ELEVATION: Approx. 380 ft amsl

NORTHING: --- EASTING: ---

NOTES: SWL= 58.27' below casing rim, 1/15/03
Well completed as a 6"dia. open borehole
170 gpm blown yield

DEPTH FEET	CUM. BLOWN YIELD	SAMP. #	LITHOLOGY
0			SILT, SAND & GRAVEL: dark yellowish brown (10 YR 4/2)
10			SAND & GRAVEL: dark yellowish brown, with sand, some silt, gravel composed of shale, dolostone, limestone, quartzite, and gneiss
20			
30			
40			CLAY: dark yellowish brown, wet
50			GRAVEL: broken, SA dark gray (N3) dolostone, tr. sand, silt and clay
60			DOLOSTONE: competent, dark gray, trace of calcite veining
70			
80	<0.5 gpm		
90			DOLOSTONE: dark gray, some weathered material
			DOLOSTONE: dark gray, trace calcite veining
100	<0.5 gpm		
110			DOLOSTONE: dark gray, trace pyrite
			DOLOSTONE: med light gray (N6) to light gray



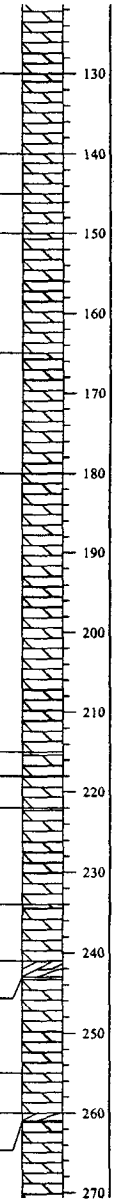
WELL CONSTRUCTION DETAILS:

- 6" locking well cap
- 10" dia. steel casing with driveshoe, 0' to 61'
- Bentonite slurry annular seal, 0' to 63.5'
- 6" dia.steel casing with driveshoe, +2.0' to 71.5'
- 9" dia. borehole, 61' to 71.5'
- Bentonite chip annular seal, 63.5' to 71.5'
- 6" dia. open borehole

GROUNDWATER SCIENCES CORPORATION

GEOLOGICLOG: SRMW-9R

DEPTH FEET	BLOWN YIELD (GPM)	SAMP. #	LITHOLOGY
	<0.5 gpm		
130			DOLOSTONE: dark gray, trace pyrite and calcite veins, soft, fractured zone at 131'
140	<0.5 gpm		DOLOSTONE: grayish black (N2), trace calcite veins
			DOLOSTONE: medium gray (N5), thin fracture at 149'
150			DOLOSTONE: dark gray, thin fracture at 164'
160	1 gpm		
			DOLOSTONE: medium dark gray (N4)
170			
180			DOLOSTONE: medium gray, weathered at 190' and 205'
190			
200	1 gpm		
210			
			DOLOSTONE: medium light gray with calcite veins
220			DOLOSTONE: light gray
			DOLOSTONE: medium gray
230			
			DOLOSTONE: medium light gray to light gray, finely crystalline, tr. pyrite
240	1 gpm		FRACTURED DOLOSTONE: medium gray to light gray, soft
			DOLOSTONE: medium light gray to light gray, finely crystalline, tr. pyrite
250			
			DOLOSTONE: medium light gray to light gray, tr pyrite
260	10 gpm		FRACTURED DOLOSTONE: water-bearing, no visible weathering
			DOLOSTONE: medium light gray to light gray, tr pyrite
270			



WELL CONSTRUCTION DETAILS:

- 6" dia. open borehole

GROUNDWATER SCIENCES CORPORATION

GEOLOGICLOG: SRMW-9R

DEPTH FEET	BLOWN YIELD (GPM)	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
280	10 gpm				280		
290					290		
300			DOLOSTONE: medium gray to med light gray, finely crystalline		300		6" dia. open borehole
310					310		
320					320		
330			DOLOSTONE: medium dark gray, finely crystalline, minor calcite veins, soft zone at 364'		330		
340					340		
350					350		
360					360		
			DOLOSTONE: medium dark gray, tr. pyrite, occasional calcite veining				
370			FRACTURED DOLOSTONE		370		
			DOLOSTONE: medium dark gray, tr. pyrite, occasional calcite veining				
380					380		
390	170 gpm		FRACTURED DOLOSTONE: water-bearing, no weathered material		390		Total depth: 391 ft
400					400		

GROUNDWATER SCIENCES CORPORATION

GEOLOGICLOG: SRMW-9S

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.11.0105*
LOGGED BY: *E. Stoner*
DATES DRILLED: *1/14/03 - 1/15/03*

NOTES: Well completed as a 2" dia. piezometer
SWL = 53.92' below casing rim, 1/16/03

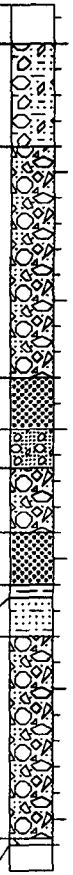
DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *C. Brenneman*
RIG TYPE: *Schramm*
DRILLING METHOD: *Air Rotary*
DEVELOPMENT DATE: ---
LOCATION: *East of Jackson Road, 10' N of SRMW-9R*

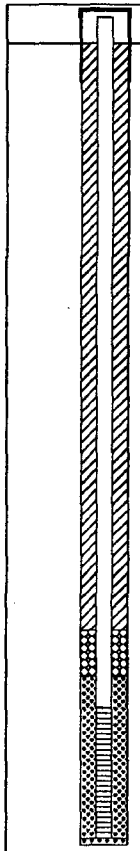
ELEVATION: Approx. 380 ft amsl
NORTHING: --- EASTING: ---

DEPTH FEET	CUM. BLOWN YIELD	SAMP. #	LITHOLOGY
0			SILT, SAND & GRAVEL: dark yellowish brown
			GRAVEL: dark yellowish brown, some sand and silt, gravel composed of shale, limestone, dolostone, quartzite, and gneiss
10			
20			
			SAND: dark yellowish brown, fine to medium, moist
30			SAND & GRAVEL: dark yellowish brown, finr to medium, with gravel
			GRAVEL: composed of various lithologies, trace sand, dry
40			SAND: mod. yellowish brown, very fine, some clay, moist
			CLAY: dark yellowish orange, trace silt, wet
			SAND & SILT: v. fine sand with silt and clay, moist
			GRAVEL: predominantly dark gray SA dolostone, tr sand, silt and clay, few quartzite pebbles
50			
60			
			DOLOSTONE: dark gray

GRAPHIC



WELL CONSTRUCTION



WELL CONSTRUCTION DETAILS

- 6" steel locking well cap
- 6" dia. steel casing with driveshoe, +2.5' to 3'
- Bentonite slurry annular seal, 0' to 45.5'
- 2" dia.sch 40 PVC riser pipe, +2.0 to 51.5'
- Bentonite chip annular seal, 45.5' to 49'
- 2" dia. 10-slot PVC screen, 51.5' to 61.5'
- #0 sand, 49' to 62'

GROUNDWATER SCIENCES CORPORATION

GEOLOGICLOG: SRMW-10R

PROJECT INFORMATION

PROJECT: *Shenandoah Alternative Water Supply*
SITE LOCATION: *Town of East Fishkill, Dutchess Co., NY*
JOB NO.: *01003.11.0105*
LOGGED BY: *E. Stoner*
DATES DRILLED: *1/16/03 - 1/21/03*

DRILLING INFORMATION

DRILLING CO.: *Eichelbergers Inc.*
DRILLER: *C. Brenneman*
RIG TYPE: *Schramm*
DRILLING METHOD: *Air Rotary*
DEVELOPMENT DATE: ---
LOCATION: *East of Jackson Road, along dirt access road*
ELEVATION: Approx. 350 ft amsl
NORTHING: --- EASTING: ---

NOTES: SWL = 39.96' below casing rim, 1/22/03
Well completed as a 6"dia. open borehole
15 gpm blown yield

DEPTH FEET	CUM. BLOWN YIELD	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
0			SILT, SAND & GRAVEL: dark yellowish brown		0		6" locking well cap
			CLAY & SILT: moderate olive brown (5 Y 4/4)				
10					10		
			SAND & SILT: moderate olive brown, vf sand w/ silt and clay				
20			CLAY & SILT: moderate olive brown (5 Y 4/4)		20		10" dia. steel casing with driveshoe, 0' to 83'
30					30		
			CLAY & SILT: med gray (N5) clay, some silt, tr fine gravel and vc sand, increasing gravel below 59'				
40					40		6" dia.steel casing with driveshoe, +2.5' to 98'
50					50		
60					60		Bentonite slurry annular seal, 0' to 87'
			GRAVEL: subangular dolostone fragments				
70					70		
			DOLOSTONE: medium dark gray (N4) to dark gray (N3) competent, occ. weathered zones decreasing below 94'				
80					80		
							9" dia. borehole, 83' to 98'
90					90		
							Bentonite chip annular seal, 87' to 98'
100	0 gpm				100		
110			DOLOSTONE: dark gray to grayish black (N2), trace of weathered material		110		
			DOLOSTONE: dark gray to grayish black, competent				

GROUNDWATER SCIENCES CORPORATION

GEOLOGICLOG: SRMW-10R

DEPTH FEET	BLOWN YIELD (GPM)	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
120	0 gpm				120		
			WEATHERED DOLOSTONE: soft, broken				
			DOLOSTONE: med gray to med light gray (N6), some weathered material				
130			WEATHERED DOLOSTONE: soft, broken		130		
			DOLOSTONE: competent				
			WEATHERED DOLOSTONE: soft, deeply weathered 139'-141'				
140	0 gpm		DOLOSTONE: med dark gray, trace of weathered material, trace of pyrite		140		6" dia. open borehole
150					150		
			WEATHERED DOLOSTONE: dark yellowish orange (10 YR 6/6), deeply weathered, with clay				
160	15 gpm		DOLOSTONE: med gray tr. calcite, sl. weathered		160		
			FRACTURED DOLOSTONE: broken, some orange silt, water-bearing				
170			DOLOSTONE: med gray, tr. calcite, more competent below 161'		170		
			DOLOSTONE: med gray, trace weathered material				
			WEATHERED DOLOSTONE: deeply weathered dark yellowish orange dolostone, some med gray				
180	15 gpm		DOLOSTONE: med gray to med dark gray, very competent, thin fractures at 186' and 199', tr pyrite at 195'		180		
190					190		
200	15 gpm				200		
210					210		
220	15 gpm		DOLOSTONE: med light gray interbedded w/ dark greenish gray (5 G 4/1), shaley texture		220		
230					230		
240	15 gpm		DOLOSTONE: med gray to med light gray, competent		240		
250					250		
260	15 gpm				260		

GROUNDWATER SCIENCES CORPORATION

GEOLOGICLOG: **SRMW-10R**

DEPTH FEET	BLOWN YIELD (GPM)	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
270					270		
280					280		6" dia. open borehole
290					290		
300					300		
310			DOLOSTONE: med dark gray, trace of calcite veining from 320' to 325', competent		310		
320					320		
330					330		
340					340		
350					350		
360					360		Total depth: 361 ft
370					370		

GROUNDWATER SCIENCES CORPORATION

GEOLOGICLOG: SRMW-10S

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	*Shenandoah Alternative Water Supply*	DRILLING CO.:	*Eichelbergers Inc.*
SITE LOCATION:	*Town of East Fishkill, Dutchess Co., NY*	DRILLER:	*C. Brenneman*
JOB NO.:	*01003.11.0105*	RIG TYPE:	*Schramm*
LOGGED BY:	*E. Stoner & J. Taylor*	DRILLING METHOD:	*Air Rotary*
DATES DRILLED:	*1/22/03*	DEVELOPMENT DATE:	---
		LOCATION:	*East of Jackson Road, approx. 10 ft S. of SRMW-10R*

NOTES: Well completed as a 2" dia. piezometer
SWL = 37.18' below casing rim, 1/24/03

ELEVATION: Approx. 350 ft amsl
NORTHING: --- EASTING: ---

DEPTH FEET	CUM. BLOWN YIELD	SAMP. #	LITHOLOGY	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
0			SILT, SAND & GRAVEL: dark yellowish brown		0		6" steel locking well cap
			CLAY & SILT				6" dia. steel casing with driveshoe, +2.5' to 3'
10					10		
			SAND & SILT: v. fine sand with silt and clay				
20			CLAY & SILT: pred. silty clay		20		2" dia.sch 40 PVC riser pipe, +2.25 to 66'
30					30		6" dia. borehole, 0 to 77'
			CLAY & SILT: med gray clay, some silt, tr. fine gravel and vc sand, increasing gravel below 59'				
40					40		
							Bentonite slurry annular seal, 0' to 60'
50					50		
60					60		Bentonite chip annular seal, 60' to 63.5'
			GRAVEL: subangular dolostone gravel				
							#0 sand, 63.5' to 77'
70					70		2" dia. 10-slot PVC screen, 66' to 76'
			DOLOSTONE: gray, competent				

Table D-2, Bedrock Groundwater Elevations

Well ID	WL Refer. Top of Casing	Depth to Water	Ground-water Elev.
SRMW-1RA	483.35	19.14	464.21
SRMW-1RB	484.89	20.37	464.52
SRMW1-RC	483.80	43.89	439.91
SRMW-2R	361.34	51.27	310.07
SRMW-3R	285.89	1.59	284.3
SRMW-4R	280.24	3.71	276.53
SRMW-5R	320.63	Artesian	>320.63
SRMW-6	337.58	11.60	325.98
SRMW-7R	333.67	1.43	332.24
SRMW-8R	370.29	45.74	324.55
SRMW-9R	378.38	58.76	319.62
SRMW-10R	358.63	39.70	318.93

APPENDIX D-2

Water Quality Data

Field Parameters for March, 2003 Sampling

	Sample ID	SRMW7R30317G	SRMW7R30320	SRMW07S30320	SRMW08R30324	SRMW09R30320	SRMW09S30320	SRMW10R30323	SRMW10S30323
	Well	SRMW-7R	SRMW-7R	SRMW-7S	SRMW-8R	SRMW-9R	SRMW-9S	SRMW-10R	SRMW-10S
	Date	3/20/2003	3/20/2003	3/20/2003	3/24/2003	3/20/2003	3/20/2003	3/23/2003	3/23/2003
Paramter/Units									
pH	pH	7.56	7.56	7.67	7.69	7.11	7.62	8.13	8.10
Specific Conductance	umhos/cm	1970	240	246	442	644	432	334	334
Temperature	C	10.08	10.10	9.21	10.67	11.41	9.72	11.10	11.12
Turbidity	NTU	8400	3800	2.19	3.82	4.13	4.78	3.26	4.82

Field Parameters for April, 2003 Sampling

	Sample ID	SRMW07R30422	SRMW07S30422	SRMW08R30424	SRMW09R30424	SRMW09S30424	SRMW10R30423	SRMW10S30423
	Well	SRMW-7R	SRMW-7S	SRMW-8R	SRMW-9R	SRMW-9S	SRMW-10R	SRMW-10S
	Date	4/22/2003	4/22/2003	4/24/2003	4/24/2003	4/24/2003	4/23/2003	4/23/2003
Paramter/Units								
pH	pH	6.92	6.93	7.89	7.40	7.33	7.68	7.27
Specific Conductance	umhos/cm	231	293	442	621	652	331	407
Temperature	C	10.14	10.91	10.84	11.82	11.60	11.03	11.52
Turbidity	NTU	0.64	39700.00	0.86	0.41	0.43	0.53	4120

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SRMW7R30317G

Lab Name: STL Newburgh Contract: 01003.11

Lab Code: 10142 Case No.: SAS No.: SDG No.: 222136

Matrix: (soil/water) WATER Lab Sample ID: 222136-003

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6012.D

Level: (low/med) LOW Date Received: 3/13/2003

% Moisture: not dec. Date Analyzed: 3/18/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
74-83-9	Bromomethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
75-00-3	Chloroethane		U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
76-13-1	Freon 113		U	0.5
67-64-1	Acetone		U	0.5
75-15-0	Carbon Disulfide		U	0.5
75-09-2	Methylene Chloride		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
156-60-5	trans-1,2-Dichloroethylene		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
67-66-3	Chloroform		U	0.5
107-06-2	1,2-Dichloroethane		U	0.5
78-93-3	2-Butanone		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5
75-27-4	Bromodichloromethane		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
79-01-6	Trichloroethene		U	0.5
71-43-2	Benzene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
75-25-2	Bromoform		U	0.5
108-10-1	4-Methyl-2-Pentanone		U	0.5
591-78-6	2-Hexanone		U	0.5
127-18-4	Tetrachloroethene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
100-42-5	Styrene		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
1330-20-7	Xylenes, total		U	0.5

SEVERN TRENT SERVICES

STL Newburgh is a part of Severn Trent Laboratories, Inc.

FORM I VOA 3/90

NYSDOH 10142 NJDEP 73015 CTDOHS PH-0554 EPA NY049 PA 68-378 M-NY049

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Tel (845) 562-0890
Fax (845) 562-0841

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SRMW07R30320

Lab Name: STL Newburgh Contract:

Lab Code: 10142 Case No.: SAS No.: SDG No.: 222254

Matrix: (soil/water) WATER Lab Sample ID: 222254-002

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6024.D

Level: (low/med) LOW Date Received: 3/21/2003

% Moisture: not dec. Date Analyzed: 3/21/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
74-83-9	Bromomethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
75-00-3	Chloroethane		U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
76-13-1	Freon 113		U	0.5
67-64-1	Acetone		U	0.5
75-15-0	Carbon Disulfide		U	0.5
75-09-2	Methylene Chloride		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
156-60-5	trans-1,2-Dichloroethylene		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
67-66-3	Chloroform		U	0.5
107-06-2	1,2-Dichloroethane		U	0.5
78-93-3	2-Butanone		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5
75-27-4	Bromodichloromethane		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
79-01-6	Trichloroethene		U	0.5
71-43-2	Benzene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
75-25-2	Bromoform		U	0.5
108-10-1	4-Methyl-2-Pentanone		U	0.5
591-78-6	2-Hexanone		U	0.5
127-18-4	Tetrachloroethene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
100-42-5	Styrene		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
1330-20-7	Xylenes, total		U	0.5

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NYSDOH 10142 NJDEP 73015 CTDOHS PH-0554 EPA NY049 PA 68-378 M-NY049

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SRMW07R30422

Lab Name: STL Newburgh Contract: 01003.11

Lab Code: 10142 Case No.: _____ SAS No.: _____ SDG No.: 223399

Matrix: (soil/water) WATER Lab Sample ID: 223399-002

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6383.D

Level: (low/med) LOW Date Received: 4/24/2003

% Moisture: not dec. _____ Date Analyzed: 4/25/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
74-83-9	Bromomethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
75-00-3	Chloroethane		U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
76-13-1	Freon 113		U	0.5
67-64-1	Acetone		U	0.5
75-15-0	Carbon Disulfide		U	0.5
75-09-2	Methylene Chloride		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
156-60-5	trans-1,2-Dichloroethylene		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
67-66-3	Chloroform		U	0.5
107-06-2	1,2-Dichloroethane		U	0.5
78-93-3	2-Butanone		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5
75-27-4	Bromodichloromethane		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
79-01-6	Trichloroethene		U	0.5
71-43-2	Benzene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
75-25-2	Bromoform		U	0.5
108-10-1	4-Methyl-2-Pentanone		U	0.5
591-78-6	2-Hexanone		U	0.5
127-18-4	Tetrachloroethene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
100-42-5	Styrene		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
1330-20-7	Xylenes, total		U	0.5

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SRMW07S30320

Lab Name: STL Newburgh Contract: _____

Lab Code: 10142 Case No.: _____ SAS No.: _____ SDG No.: 222254

Matrix: (soil/water) WATER Lab Sample ID: 222254-001

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6023.D

Level: (low/med) LOW Date Received: 3/21/2003

% Moisture: not dec. _____ Date Analyzed: 3/21/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
74-83-9	Bromomethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
75-00-3	Chloroethane		U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
76-13-1	Freon 113		U	0.5
67-64-1	Acetone		U	0.5
75-15-0	Carbon Disulfide		U	0.5
75-09-2	Methylene Chloride		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
156-60-5	trans-1,2-Dichloroethylene		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
67-66-3	Chloroform		U	0.5
107-06-2	1,2-Dichloroethane		U	0.5
78-93-3	2-Butanone		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5
75-27-4	Bromodichloromethane		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
79-01-6	Trichloroethene		U	0.5
71-43-2	Benzene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
75-25-2	Bromoform		U	0.5
108-10-1	4-Methyl-2-Pentanone		U	0.5
591-78-6	2-Hexanone		U	0.5
127-18-4	Tetrachloroethene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
100-42-5	Styrene		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
1330-20-7	Xylenes, total		U	0.5

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SRMW07S30422

Lab Name: STL Newburgh Contract: 01003.11

Lab Code: 10142 Case No.: SAS No.: SDG No.: 223399

Matrix: (soil/water) WATER Lab Sample ID: 223399-001

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6382.D

Level: (low/med) LOW Date Received: 4/24/2003

% Moisture: not dec. Date Analyzed: 4/25/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
74-83-9	Bromomethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
75-00-3	Chloroethane		U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
76-13-1	Freon 113		U	0.5
67-64-1	Acetone		U	0.5
75-15-0	Carbon Disulfide		U	0.5
75-09-2	Methylene Chloride		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
156-60-5	trans-1,2-Dichloroethylene		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
67-66-3	Chloroform		U	0.5
107-06-2	1,2-Dichloroethane		U	0.5
78-93-3	2-Butanone		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5
75-27-4	Bromodichloromethane		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
79-01-6	Trichloroethene		U	0.5
71-43-2	Benzene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
75-25-2	Bromoform		U	0.5
108-10-1	4-Methyl-2-Pentanone		U	0.5
591-78-6	2-Hexanone		U	0.5
127-18-4	Tetrachloroethene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
100-42-5	Styrene		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
1330-20-7	Xylenes, total		U	0.5

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SRMW08R30324

Lab Name: STL Newburgh Contract:

Lab Code: 10142 Case No.: SAS No.: SDG No.: 222298

Matrix: (soil/water) WATER Lab Sample ID: 222298-005

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6045.D

Level: (low/med) LOW Date Received: 3/24/2003

% Moisture: not dec. Date Analyzed: 3/24/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
74-83-9	Bromomethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
75-00-3	Chloroethane		U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
76-13-1	Freon 113		U	0.5
67-64-1	Acetone		U	0.5
75-15-0	Carbon Disulfide		U	0.5
75-09-2	Methylene Chloride		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
156-60-5	trans-1,2-Dichloroethylene		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
67-66-3	Chloroform		U	0.5
107-06-2	1,2-Dichloroethane		U	0.5
78-93-3	2-Butanone		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5
75-27-4	Bromodichloromethane		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
79-01-6	Trichloroethene		U	0.5
71-43-2	Benzene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
75-25-2	Bromoform		U	0.5
108-10-1	4-Methyl-2-Pentanone		U	0.5
591-78-6	2-Hexanone		U	0.5
127-18-4	Tetrachloroethene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
100-42-5	Styrene		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
1330-20-7	Xylenes, total		U	0.5

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SRMW08R30424

Lab Name: STL Newburgh Contract: 01003.11

Lab Code: 10142 Case No.: SAS No.: SDG No.: 223399

Matrix: (soil/water) WATER Lab Sample ID: 223399-009

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6392.D

Level: (low/med) LOW Date Received: 4/24/2003

% Moisture: not dec. Date Analyzed: 4/25/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
74-83-9	Bromomethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
75-00-3	Chloroethane		U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
76-13-1	Freon 113		U	0.5
67-64-1	Acetone		U	0.5
75-15-0	Carbon Disulfide		U	0.5
75-09-2	Methylene Chloride		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
156-60-5	trans-1,2-Dichloroethylene		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
67-66-3	Chloroform		U	0.5
107-06-2	1,2-Dichloroethane		U	0.5
78-93-3	2-Butanone		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5
75-27-4	Bromodichloromethane		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
79-01-6	Trichloroethene		U	0.5
71-43-2	Benzene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
75-25-2	Bromoform		U	0.5
108-10-1	4-Methyl-2-Pentanone		U	0.5
591-78-6	2-Hexanone		U	0.5
127-18-4	Tetrachloroethene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
100-42-5	Styrene		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
1330-20-7	Xylenes, total		U	0.5

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SR008R30424X

Lab Name: STL Newburgh Contract: 01003.11

Lab Code: 10142 Case No.: SAS No.: SDG No.: 223399

Matrix: (soil/water) WATER Lab Sample ID: 223399-008

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6391.D

Level: (low/med) LOW Date Received: 4/24/2003

% Moisture: not dec. Date Analyzed: 4/25/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
74-83-9	Bromomethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
75-00-3	Chloroethane		U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
76-13-1	Freon 113		U	0.5
67-64-1	Acetone		U	0.5
75-15-0	Carbon Disulfide		U	0.5
75-09-2	Methylene Chloride		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
156-60-5	trans-1,2-Dichloroethylene		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
67-66-3	Chloroform		U	0.5
107-06-2	1,2-Dichloroethane		U	0.5
78-93-3	2-Butanone		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5
75-27-4	Bromodichloromethane		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
79-01-6	Trichloroethene		U	0.5
71-43-2	Benzene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
75-25-2	Bromoform		U	0.5
108-10-1	4-Methyl-2-Pentanone		U	0.5
591-78-6	2-Hexanone		U	0.5
127-18-4	Tetrachloroethene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
100-42-5	Styrene		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
1330-20-7	Xylenes, total		U	0.5

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SRMW09R30320

Lab Name: STL Newburgh Contract:

Lab Code: 10142 Case No.: SAS No.: SDG No.: 222254

Matrix: (soil/water) WATER Lab Sample ID: 222254-004

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6034.D

Level: (low/med) LOW Date Received: 3/21/2003

% Moisture: not dec. Date Analyzed: 3/24/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
74-83-9	Bromomethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
75-00-3	Chloroethane		U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
76-13-1	Freon 113		U	0.5
67-64-1	Acetone		U	0.5
75-15-0	Carbon Disulfide		U	0.5
75-09-2	Methylene Chloride		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
156-60-5	trans-1,2-Dichloroethylene		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
67-66-3	Chloroform		U	0.5
107-06-2	1,2-Dichloroethane		U	0.5
78-93-3	2-Butanone		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5
75-27-4	Bromodichloromethane		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
79-01-6	Trichloroethene		U	0.5
71-43-2	Benzene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
75-25-2	Bromoform		U	0.5
108-10-1	4-Methyl-2-Pentanone		U	0.5
591-78-6	2-Hexanone		U	0.5
127-18-4	Tetrachloroethene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
100-42-5	Styrene		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
1330-20-7	Xylenes, total		U	0.5

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SR009R30320X

Lab Name: STL Newburgh Contract:

Lab Code: 10142 Case No.: SAS No.: SDG No.: 222254

Matrix: (soil/water) WATER Lab Sample ID: 222254-005

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6035.D

Level: (low/med) LOW Date Received: 3/21/2003

% Moisture: not dec. Date Analyzed: 3/24/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
74-83-9	Bromomethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
75-00-3	Chloroethane		U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
76-13-1	Freon 113		U	0.5
67-64-1	Acetone		U	0.5
75-15-0	Carbon Disulfide		U	0.5
75-09-2	Methylene Chloride		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
156-60-5	trans-1,2-Dichloroethylene		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
67-66-3	Chloroform		U	0.5
107-06-2	1,2-Dichloroethane		U	0.5
78-93-3	2-Butanone		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5
75-27-4	Bromodichloromethane		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
79-01-6	Trichloroethene		U	0.5
71-43-2	Benzene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
75-25-2	Bromoform		U	0.5
108-10-1	4-Methyl-2-Pentanone		U	0.5
591-78-6	2-Hexanone		U	0.5
127-18-4	Tetrachloroethene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
100-42-5	Styrene		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
1330-20-7	Xylenes, total		U	0.5

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SRMW09R30424

Lab Name: STL Newburgh Contract: 01003.11

Lab Code: 10142 Case No.: _____ SAS No.: _____ SDG No.: 223399

Matrix: (soil/water) WATER Lab Sample ID: 223399-007

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6390.D

Level: (low/med) LOW Date Received: 4/24/2003

% Moisture: not dec. _____ Date Analyzed: 4/25/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
74-83-9	Bromomethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
75-00-3	Chloroethane		U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
76-13-1	Freon 113		U	0.5
67-64-1	Acetone		U	0.5
75-15-0	Carbon Disulfide		U	0.5
75-09-2	Methylene Chloride		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
156-60-5	trans-1,2-Dichloroethylene		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
67-66-3	Chloroform		U	0.5
107-06-2	1,2-Dichloroethane		U	0.5
78-93-3	2-Butanone		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5
75-27-4	Bromodichloromethane		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
79-01-6	Trichloroethene		U	0.5
71-43-2	Benzene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
75-25-2	Bromoform		U	0.5
108-10-1	4-Methyl-2-Pentanone		U	0.5
591-78-6	2-Hexanone		U	0.5
127-18-4	Tetrachloroethene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
100-42-5	Styrene		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
1330-20-7	Xylenes, total		U	0.5

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SRMW09S30320

Lab Name: STL Newburgh Contract: _____

Lab Code: 10142 Case No.: _____ SAS No.: _____ SDG No.: 222254

Matrix: (soil/water) WATER Lab Sample ID: 222254-003

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6025.D

Level: (low/med) LOW Date Received: 3/21/2003

% Moisture: not dec. _____ Date Analyzed: 3/21/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
74-83-9	Bromomethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
75-00-3	Chloroethane		U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
76-13-1	Freon 113		U	0.5
67-64-1	Acetone		U	0.5
75-15-0	Carbon Disulfide		U	0.5
75-09-2	Methylene Chloride		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
156-60-5	trans-1,2-Dichloroethylene		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
67-66-3	Chloroform		U	0.5
107-06-2	1,2-Dichloroethane		U	0.5
78-93-3	2-Butanone		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5
75-27-4	Bromodichloromethane		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
79-01-6	Trichloroethene		U	0.5
71-43-2	Benzene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
75-25-2	Bromoform		U	0.5
108-10-1	4-Methyl-2-Pentanone		U	0.5
591-78-6	2-Hexanone		U	0.5
127-18-4	Tetrachloroethene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
100-42-5	Styrene		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
1330-20-7	Xylenes, total		U	0.5

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SRMW09S30424

Lab Name: STL Newburgh Contract: 01003.11

Lab Code: 10142 Case No.: SAS No.: SDG No.: 223399

Matrix: (soil/water) WATER Lab Sample ID: 223399-006

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6389.D

Level: (low/med) LOW Date Received: 4/24/2003

% Moisture: not dec. Date Analyzed: 4/25/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
74-83-9	Bromomethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
75-00-3	Chloroethane		U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
76-13-1	Freon 113		U	0.5
67-64-1	Acetone		U	0.5
75-15-0	Carbon Disulfide		U	0.5
75-09-2	Methylene Chloride		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
156-60-5	trans-1,2-Dichloroethylene		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
67-66-3	Chloroform		U	0.5
107-06-2	1,2-Dichloroethane		U	0.5
78-93-3	2-Butanone		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5
75-27-4	Bromodichloromethane		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
79-01-6	Trichloroethene		U	0.5
71-43-2	Benzene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
75-25-2	Bromoform		U	0.5
108-10-1	4-Methyl-2-Pentanone		U	0.5
591-78-6	2-Hexanone		U	0.5
127-18-4	Tetrachloroethene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
100-42-5	Styrene		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
1330-20-7	Xylenes, total		U	0.5

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SRMW10R30323

Lab Name: STL Newburgh Contract:

Lab Code: 10142 Case No.: SAS No.: SDG No.: 222298

Matrix: (soil/water) WATER Lab Sample ID: 222298-002

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6042.D

Level: (low/med) LOW Date Received: 3/24/2003

% Moisture: not dec. Date Analyzed: 3/24/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
74-83-9	Bromomethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
75-00-3	Chloroethane		U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
76-13-1	Freon 113		U	0.5
67-64-1	Acetone		U	0.5
75-15-0	Carbon Disulfide		U	0.5
75-09-2	Methylene Chloride		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
156-60-5	trans-1,2-Dichloroethylene		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
67-66-3	Chloroform		U	0.5
107-06-2	1,2-Dichloroethane		U	0.5
78-93-3	2-Butanone		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5
75-27-4	Bromodichloromethane		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
79-01-6	Trichloroethene		U	0.5
71-43-2	Benzene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
75-25-2	Bromoform		U	0.5
108-10-1	4-Methyl-2-Pentanone		U	0.5
591-78-6	2-Hexanone		U	0.5
127-18-4	Tetrachloroethene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
100-42-5	Styrene		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
1330-20-7	Xylenes, total		U	0.5

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SR010R30323X

Lab Name: STL Newburgh Contract:

Lab Code: 10142 Case No.: SAS No.: SDG No.: 222298

Matrix: (soil/water) WATER Lab Sample ID: 222298-003

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6043.D

Level: (low/med) LOW Date Received: 3/24/2003

% Moisture: not dec. Date Analyzed: 3/24/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
74-83-9	Bromomethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
75-00-3	Chloroethane		U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
76-13-1	Freon 113		U	0.5
67-64-1	Acetone		U	0.5
75-15-0	Carbon Disulfide		U	0.5
75-09-2	Methylene Chloride		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
156-60-5	trans-1,2-Dichloroethylene		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
67-66-3	Chloroform		U	0.5
107-06-2	1,2-Dichloroethane		U	0.5
78-93-3	2-Butanone		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5
75-27-4	Bromodichloromethane		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
79-01-6	Trichloroethene		U	0.5
71-43-2	Benzene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
75-25-2	Bromoform		U	0.5
108-10-1	4-Methyl-2-Pentanone		U	0.5
591-78-6	2-Hexanone		U	0.5
127-18-4	Tetrachloroethene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
100-42-5	Styrene		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
1330-20-7	Xylenes, total		U	0.5

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SRMW10R30423

Lab Name: STL Newburgh Contract: 01003.11

Lab Code: 10142 Case No.: SAS No.: SDG No.: 223399

Matrix: (soil/water) WATER Lab Sample ID: 223399-004

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6385.D

Level: (low/med) LOW Date Received: 4/24/2003

% Moisture: not dec. Date Analyzed: 4/25/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
74-83-9	Bromomethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
75-00-3	Chloroethane		U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
76-13-1	Freon 113		U	0.5
67-64-1	Acetone		U	0.5
75-15-0	Carbon Disulfide		U	0.5
75-09-2	Methylene Chloride		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
156-60-5	trans-1,2-Dichloroethylene		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
67-66-3	Chloroform		U	0.5
107-06-2	1,2-Dichloroethane		U	0.5
78-93-3	2-Butanone		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5
75-27-4	Bromodichloromethane		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
79-01-6	Trichloroethene		U	0.5
71-43-2	Benzene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
75-25-2	Bromoform		U	0.5
108-10-1	4-Methyl-2-Pentanone		U	0.5
591-78-6	2-Hexanone		U	0.5
127-18-4	Tetrachloroethene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
100-42-5	Styrene		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
1330-20-7	Xylenes, total		U	0.5

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SRMW10S30323

Lab Name: STL Newburgh Contract:

Lab Code: 10142 Case No.: SAS No.: SDG No.: 222298

Matrix: (soil/water) WATER Lab Sample ID: 222298-004

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6044.D

Level: (low/med) LOW Date Received: 3/24/2003

% Moisture: not dec. Date Analyzed: 3/24/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
74-83-9	Bromomethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
75-00-3	Chloroethane		U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
76-13-1	Freon 113		U	0.5
67-64-1	Acetone		U	0.5
75-15-0	Carbon Disulfide		U	0.5
75-09-2	Methylene Chloride		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
156-60-5	trans-1,2-Dichloroethylene		U	0.5
540-59-0	cis-1,2-Dichlcroethane		U	0.5
67-66-3	Chloroform		U	0.5
107-06-2	1,2-Dichloroethane		U	0.5
78-93-3	2-Butanone		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5
75-27-4	Bromodichloromethane		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
79-01-6	Trichloroethene		U	0.5
71-43-2	Benzene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
75-25-2	Bromoform		U	0.5
108-10-1	4-Methyl-2-Pentanone		U	0.5
591-78-6	2-Hexanone		U	0.5
127-18-4	Tetrachloroethene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
100-42-5	Styrene		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
1330-20-7	Xylenes, total		U	0.5

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SRMW10S30423

Lab Name: STL Newburgh Contract: 01003.11

Lab Code: 10142 Case No.: SAS No.: SDG No.: 223399

Matrix: (soil/water) WATER Lab Sample ID: 223399-003

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: V6384.D

Level: (low/med) LOW Date Received: 4/24/2003

% Moisture: not dec. Date Analyzed: 4/25/2003

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Units: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	RESULT	Q	RL
75-71-8	Dichlorodifluoromethane		U	0.5
74-87-3	Chloromethane		U	0.5
74-83-9	Bromomethane		U	0.5
75-01-4	Vinyl Chloride		U	0.5
75-00-3	Chloroethane		U	0.5
75-69-4	Trichlorofluoromethane		U	0.5
76-13-1	Freon 113		U	0.5
67-64-1	Acetone		U	0.5
75-15-0	Carbon Disulfide		U	0.5
75-09-2	Methylene Chloride		U	0.5
75-35-4	1,1-Dichloroethene		U	0.5
75-34-4	1,1-Dichloroethane		U	0.5
156-60-5	trans-1,2-Dichloroethylene		U	0.5
540-59-0	cis-1,2-Dichloroethene		U	0.5
67-66-3	Chloroform		U	0.5
107-06-2	1,2-Dichloroethane		U	0.5
78-93-3	2-Butanone		U	0.5
71-55-6	1,1,1-Trichloroethane		U	0.5
56-23-5	Carbon Tetrachloride		U	0.5
75-27-4	Bromodichloromethane		U	0.5
78-87-5	1,2-Dichloropropane		U	0.5
10061-01-5	cis-1,3-Dichloropropene		U	0.5
79-01-6	Trichloroethene		U	0.5
71-43-2	Benzene		U	0.5
124-48-1	Dibromochloromethane		U	0.5
10061-02-6	trans-1,3-Dichloropropene		U	0.5
79-00-5	1,1,2-Trichloroethane		U	0.5
75-25-2	Bromoform		U	0.5
108-10-1	4-Methyl-2-Pentanone		U	0.5
591-78-6	2-Hexanone		U	0.5
127-18-4	Tetrachloroethene		U	0.5
108-88-3	Toluene		U	0.5
108-90-7	Chlorobenzene		U	0.5
100-41-4	Ethylbenzene		U	0.5
100-42-5	Styrene		U	0.5
79-34-5	1,1,2,2-Tetrachloroethane		U	0.5
1330-20-7	Xylenes, total		U	0.5

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