REMEDIAL INVESTIGATION REPORT

Valley Falls Dry Cleaner

December 1996

Volume 1 of 2

State Superfund Project
Inactive Hazardous Waste Site No. 4-42-028

Prepared by the
New York State Department of Environmental Conservation
Division of Environmental Remediation

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Prepared by the
New York State Department of Environmental Conservation
Division of Environmental Remediation
in association with the
New York State Department of Health
Division of Environmental Health Assessment

SECTION 1: OBJECTIVES OF THE REMEDIAL INVESTIGATION

The goals of this Remedial Investigation are:

(1) to determine the nature and extent of contamination in the vadose zone and in the deep and shallow aquifers;

(2) to study the physical characteristics of the aquifers in sufficient detail to adequately conceptualize the distribution and migration of contaminants; and

(3) to establish the data base necessary for DEC's performance of a Focused Feasibility Study.

SECTION 2: SUMMARY OF SITE HISTORY AND BACKGROUND INFORMATION

2.1: Site Location and Description

The Valley Falls Dry Cleaner site is located in a residential area where single family homes are serviced by private drinking water wells. The site is approximately 0.5 mile from the Hoosic river, and is located within the incorporated Village of Valley Falls, a small, rural community on the Hoosic River in the Town of Pittstown, Rensselaer County. See the site location maps, Figure 1 and Figure 2.

The site, the former Winchell Dry Cleaners property, consists of a relatively flat parcel of land, and includes the residence at 11 Lyons Street. The site actually includes four contiguous parcels totaling about 1.5 acres. However, the two more distant parcels are not likely to contain volatile contamination (See the property survey, Figure 3).

The present owners purchased the property as their family residence in 1978. In 1993, the owners demolished most of the deteriorated vacant dry cleaners building. All that remains of the dry cleaner building is: (a) the slab foundation, (b) a small, deteriorated, underground storage tank (that was part of the septic system), and (c) a small section of the building which has been incorporated into the garage structure. The private drinking water well for the property is located under this structure; it is a bedrock well approximately 110 feet deep and test results show up to 47 parts per billion (ppb) of perchloroethene (See site map, Figure 4).

2.2: Site History

The Valley Falls Dry Cleaners, or Winchell Dry Cleaners, was established in the 1940's by Mr. Winchell and operated continuously through the early 1970's. It was reportedly sold by Mr. Winchell to Mr. Johnson in the early 1970s. Mr. Johnson continued to operate the facility for a few years, and the property was resold and then abandoned in the mid 1970's. It is believed that the dry cleaning operation discharged perchloroethene wastes directly onto the ground surface by washing lint filters and in wash water or "grey water" which discharged into an on-site septic system.

In November, 1991, an adjacent property-owner at 12 Charles Street had his private drinking water analyzed and the laboratory reported the presence of perchloroethene (also called tetrachloroethene) in their well at 150 ppb. The New York State Department of Health (NYSDOH) was notified of these results and sampled several adjacent private wells. Sampling conducted in January 1992, identified tetrachloroethene (PCE) at concentrations ranging from less than 5 ppb to 190 ppb. The private well sample with 190 ppb of PCE also contained trichloroethene (TCE) at 22 ppb and cis-1,2 dichloroethene (cis-1,2 DCE) at 24 ppb.

In five of the sampled wells, PCE levels exceeded the NYSDOH maximum drinking water contaminant level (MCL) of 5 ppb. In one of the wells, the concentration of PCE exceeded the United States Environmental Protection Agency (USEPA) action level of 67 ppb. As a result, the site was referred by the NYSDEC to the USEPA for an emergency response action on March 5, 1992. On March 26, 1992, USEPA initiated as interim protective measure the delivery of bottled water to the five residences where contaminant levels exceeded applicable drinking water standards. In August, 1992, USEPA installed granular activated carbon (GAC) filters and ultraviolet (UV) sterilization units at these properties. The GAC filters are designed to remove volatile organic compounds (VOCs) such as TCE and PCE from water. The UV treatment units remove any bacterial contamination that may be associated with the use of carbon filters.

On June 7, 1993, the NYSDEC completed a Phase I assessment of the site, and the site was listed on the New York State Registry as a Class 2 Inactive Hazardous Waste Disposal Site. A Class 2 Inactive Hazardous Waste Disposal Site is defined as a site which poses a significant threat to the public health or environment. The NYSDEC notified the

USEPA that the NYSDEC would take over responsibility for the operation and maintenance of the carbon units at the five residences. This has been done for the past three years by NYSDEC contractors on a semi-annual basis. No further on-site field investigations were performed until September 1996.

NYSDOH has continued to sample private wells in Valley Falls. Since January 1992, the NYSDOH has sampled 110 private wells. In a sample collected during November 1994, a private shallow well on State Street showed 9.7 ppb of PCE, exceeding the MCL. The NYSDEC installed a treatment system on this supply in January, 1995. In April 1996, the NYSDOH sampled the drinking water supply serving a three unit apartment dwelling on State Street. The results of the sampling showed 5.2 ppb of PCE and the NYSDEC installed a treatment system on this supply in May 1996. Since the groundwater contamination was first discovered near the site, GAC filter and UV light treatment systems have been installed at seven residences.

2.3: Background Geology and Hydrogeology

The site lies on the south side of the lower Hoosic River Valley at an elevation of approximately 375 feet above Mean Sea Level, within the Hudson River drainage basin. Valley Falls is about 6 miles east of the confluence of the Hoosic and Hudson Rivers. Bedrock occurs at 23 feet below grade at the site, and is mapped as lower Ordovician and upper Cambrian limestone and calcareous somewhat carbonaceous black shale. The bedrock is competent, largely deformed and nearly vertically bedded in outcrop. Bedrock in the area is overlain by a variety of unconsolidated glacial deposits, deposited during the advance and retreat of the late Wisconsin Glaciation. Although remnants of the Eagle Bridge recessional moraine are evident south of the site, most of the area south of the site is typified by lodgement till and drumlins. The site itself lies near the southern margin of the Hoosic River glacial lacustine deltaic and river terrace deposits. Based on topography and surface drainage, groundwater flow is anticipated to be toward the northwest, with bedrock fracture and bedding orientation influencing flow direction of deeper groundwater.

Groundwater obtained from the bedrock and overburden through drilled or dug individual residential wells serves as the water supply for residents in the Village of Valley Falls.

2.4: Past Investigative Results

The following is a summary of the data collected from the seven residential wells in Valley Falls that exceeded the NYSDOH MCL for PCE. For well locations in proximity to the site, see Figure 5. The listed concentrations of PCE, in parts per billion (ppb), were detected in samples taken between 1992 to 1996.

Residence	Type of Well	Concentrations PCE (ppb)
# 16 Charles St.	45' drilled well	8.0
# 10 Charles St.	150' drilled well	5.0
# 11 Lyons St.	120' drilled well	47.0
# 36 State St.	dug	9.7
# 12 Charles St.	15' dug	115* - 190*
# 9 Edward St.	drilled bedrock well	130
# 31 State St.	90' to 100' drilled well	5.2

* sample also contained two breakdown products of PCE - trichloroethene & cis-1,2 dichloroethene

On September 18, 1995, just prior to beginning the Remedial Investigation, the NYSDEC took a water sample from the old septic tank on the property and five soil samples at a depth of 24 inches. The results indicated very low or trace levels of PCE and breakdown products in the soil and water. See Figure 8.

The NYSDEC developed a Remedial Investigation Workplan, and on November 27, 1995 the workplan was presented to the public at the public meeting held at 7:30pm in the Valley Falls Village Community Center.

The principal elements of the Remedial Investigation included:

1.) Background research and an assessment of the existing data
2.) Soil gas survey
3.) Shallow test pits
4.) Soil borings with continuous split spoon sampling
5.) Installation of monitoring wells
6.) Groundwater monitoring, groundwater and soil sampling and analysis
7.) Exposure Pathways Evaluation
8.) Site mapping and surveying
9.) Report preparation
10.) Public participation

The results of the Remedial Investigation are summarized in the following sections of this report.

SECTION 3: REMEDIAL INVESTIGATION RESULTS

3.1: Assessment of Existing Data and Background Research

A preliminary field investigation was never performed at this site, however the NYSDOH has conducted extensive sampling of drinking water wells in the Village. The NYSDOH has periodically resampled those water supplies where low level contamination was found. The analytical data from these samples were used to help to locate the off-site groundwater monitoring wells. In addition, historical aerial photographs, former employees and neighbors helped identify any spill areas and explain the past site operations.

The locations of buried utilities and pipelines both on-site and off-site were identified prior to the soil gas survey, the test pit trenching and monitoring well installation. The following sources were consulted: individual property owners; utility companies; Village of Valley Falls; Town of Pittstown.

On December 11, 1995, NYSDEC staff performed a site survey with an EM-31 terrain conductivity meter to help characterize shallow subsurface conditions. Readings were taken on a 10 foot grid spacing in the area behind the former dry cleaners. A sketch of the results is shown on Figure 9. The purpose of the terrain conductivity survey was to help locate underground pipes, dry wells, and identify lateral changes in soil. The terrain conductivity survey data proved to be of limited value due to interference from metal fencing and other near-surface metal objects. The terrain conductivity survey data did indicate two areas of anomalous readings behind the old foundation. This could have been indicative of fill material, changes in subsurface moisture, buried metal objects, or possibly a dry well.

The drain pipe on the abandoned septic tank, shown on the site sketch, Figure 4, was investigated with a power snake on December 18, 1995. The snake was fed into the drain line from the septic tank. Thirty feet of drain snake was fed into the line before it stopped. Two subsurface metal detection methods were utilized in an attempt to exactly locate the metal snake below ground. One method involved inducing an electrical current in the snake, and trying to detect the current from ground surface with a metal detector. The other method used a standard metal detector to try to locate the snake below ground in the clay septic pipe.

The results of the septic drain pipe investigation indicated that the clay septic drain pipe extends straight back to just beyond the edge of the concrete foundation. The results tended to indicate that the pipe terminated there, possibly in a dry well. However, digging with a backhoe later revealed that there was a 90 degree pipe elbow approximately 33 feet from the old septic tank (see Section 3.3)

On December 15, 1995, a pumping and electrical contractor who serviced the former Winchell Dry Cleaners from the 1940's until the early 1970's was interviewed on site. He was able to provide information from memory on the location of dry cleaning equipment, PCE storage tank and still, and the general day to day operation of the laundry and dry cleaner. The Contractor remembered Mr. Winchell as being very frugal. He said that Mr. Winchell would try to recover all dry cleaning fluid to save cost. His opinion was that the most likely source of PCE contamination in groundwater while Mr. Winchell operated the dry cleaners would have been from lint filters which were washed outside the old building and from traces of PCE in wash water discharged into the old septic system. He remembered a door on the east side of the old building which he speculated to be the door most likely to have been used for removing filters from the building. He suggested that filter may have been hosed off outside that door. The Contractor was unable to provide any information on the operation after it was sold to Mr. Johnson in the early 1970's. He did remember a dry cleaning still being in use since the 1940's to recycle dry cleaning fluid as a cost saving measure.

The Village Mayor provided a copy of a map of the Village prepared by Lamont, Van De Valk Engineers, P.C., which shows the approximate location of the existing old village sewer line, referred to by some as the "outlaw system". The map shows the line extending up the alley next to the site. However, the residences at 12 and 16 Charles St., located across the alley from the site were reportedly never hooked up to this sewer line, having always used individual septic systems. It is possible the old existing sewer system could have been extended up the alley to the former dry cleaners, but this could not be confirmed. The old sewer system was installed in the village in the early 1900's, and is a straight pipe to the Hoosic River. Some residences in the Village still discharge household wastewater into this old system. Construction of a new federally funded sewerage system, connecting all residents of the Village, is slated to begin within the next year.

No buried utilities, such a natural gas lines, telephone cables, cable television, or electric lines, were identified on site.

3.2: Soil Gas Survey

Soil is made up of particles that do not fit tightly together. The tiny air space between the soil particles is called soil gas. When soil is contaminated with certain chemicals, such as PCE, the chemicals can volatilize into the soil gas between the soil particles and move through the soil. Testing the shallow soil gas is a good and fast method to aid in determining the location of contamination below.

A soil gas survey was performed on site on December 11th & 12th 1995 by Zebra Environmental Corporation, under subcontract to the Department. The goal of the survey was to help determine the lateral extent of PCE contamination. This was accomplished by a Geoprobe mounted on a four wheel drive pickup truck. The methodology is described in Appendix A.

Soil gas samples were taken from fifty-six points. A grid was laid out on a 10 foot spacing, and the grid was expanded as samples and field gas chromatograph results were obtained. The results of the soil gas survey are depicted on Figure 10 and shown in Table 1. High concentrations of PCE or volatile organic breakdown products in the soil gas are indicative of these compounds in the groundwater or soil below. The results of the soil gas survey indicated concentrations of PCE in the soil gas greater than 1 part per million (ppm) behind the foundation, with a small area greater than 5 ppm, and one location greater than 10 ppm under the foundation (Figure 10).

3.3: Shallow Test Pits

On Monday, April 8, 1996 a backhoe was used to dig test pits behind the old foundation. The soil gas survey results were used as a guide in locating the pits. Test pits were carefully dug with a backhoe in an attempt to locate buried clay septic pipes, a dry well or contaminant source area.

Subsurface conditions and the shallow stratigraphy were noted and logged. A Photovac Tip was used to measure concentrations of VOC's in the test pits. If high Photovac Tip readings or visibly contaminated soils were encountered, a soil sample was taken for laboratory analysis. Each test pit was filled in with the soil removed from the pit before proceeding to the next test pit location. The test pit locations were marked with wooden stakes so their locations could be surveyed and placed on the base map.

A test trench was dug along the back of the foundation to a depth of about six to eight feet, or about two feet below the depth that groundwater was encountered. A small amount of a grey sludge like material was discovered about 2 feet below grade in one area. A reading of zero was detected with the photovac above this material. During the excavation of this trench, a 1000 gallon underground fuel storage tank was discovered. The steel tank, which measured 4 feet in diameter and 11 feet in length, was at a depth of approximately 18 inches below grade. Half of the tank was under the old concrete foundation. The NYSDEC Region 4 Oil Spills Response Unit was immediately contacted. A few feet east of the tank, the clay drain pipe from the old collapsed steel septic tank was encountered. The 4 inch clay pipe was sleeved in a 8 inch clay pipe, and the pipe was in very good condition. The clay drain pipe extended several feet straight back from the old foundation (33.4 feet from the old septic tank), then turned 90 degrees east, running parallel to the back of the old foundation for 9.3 feet, were it ended in a 9 feet by 6 feet concrete block dry well. A sketch of the layout of the abandoned septic system is shown on Figure 11.

The top of the dry well was about 2 feet below grade, and was covered with old railroad ties and about 1 foot of soil. It was about 5 feet deep, and had about 1 foot of standing water on the bottom, indicative of the approximate elevation of the watertable. A reading of 5.4 ppm was detected with the photovac tip when the dry well was first opened.

The reading quickly dropped to zero, and photovac tip readings remained zero during the investigation of the dry well. An old 4 inch iron pipe entered the dry well on the north side. Approximately four cinder blocks on each wall of the dry well were placed sideways when the dry well was built to allow waste water to drain to the soils. The bottom of the dry well was native material (sand and gravel). About 3 feet of the top of the dry well was uncovered during the investigation. Samples were taken for laboratory analysis from the sides and bottom of the dry well. The dry well was then recovered with the old railroad ties and surface soil. A orange plastic snow fence was then erected around the old dry well.

Following the excavation of the old dry well, a representive from the NYSDEC Region 4 Spill Response Unit arrived on site, and the test pit investigation focused back on the 1000 gallon underground storage tank. Two approximately 2 inch threaded openings were uncovered on the top of the tank. A photovac tip stuck in one opening in the top of the tank read 144 ppm, and a reading of 37 ppm was taken from the end of a 1 inch steel pipe which was apparently connected to the top of the tank at one time. There was approximately one foot of liquid in the bottom of the tank, which appeared to contain number 2 fuel oil and water. In a 1000 gallon tank, this would equate to about 200 gallons of liquid. A sample of this liquid in the tank was taken for laboratory analysis. A test trench was dug on the west side of the tank to a depth of about 6½ feet to look for any oil sheen on the ground water. None was detected. Samples for laboratory analysis were also taken of the soil next to the fuel tank and the groundwater in the test pit next to the tank.

The analytical results from the test pits and soil sampling are summarized on Table 8. The highest concentration of PCE was detected in sample number TP-4B (4100 ppb). Sample number TP-4B was a soil sample that was taken from about 3 feet below grade level below the septic pipe behind the old foundation. This sample contained some of the grey sludge like material that was discovered behind the old foundation. The grey sludge like material was about 4 inches thick and appeared to be confined to a very localized area, about 9 feet square, behind the old foundation. Much of the layer of grey sludge like material was dispersed and broken up by the digging of the test trench behind the foundation.

3.4: Installation of Monitoring Wells/ Continuous Split Spoon Sampling

The goals of well installation, split spoon sampling and groundwater monitoring are:

- To determine the vertical extent of soil and groundwater contamination.
- To determine the lateral extent of aquifer contamination.
- To make aquifer measurements necessary to postulate the likely migration rates and pathways within the deep and shallow aquifers.

3.4.1: Borings/Well Installations

On Tuesday, December 12, 1995 American Auger arrived on site to begin the borings and monitoring well installation. Drilling started at the upgradient location on the bedrock well, MW-1D. MW-1D and MW-2S were successfully completed, and field investigation work was stopped on December 19, 1995 due to inclement weather. Field operations resumed on April 2, 1996, and by April 10, 1996 all the monitoring wells had been successfully installed.

The locations of the initial soil borings are shown on Figure 2. A total of four monitoring well pairs were installed. The first boring at each location was advanced to bedrock with a 6 1/4 - inch I.D. hollow stem auger. Bedrock was estimated to be 30 to 40 feet below grade, and in fact the depth to bedrock ranged from 23 to 33½ feet below grade. Continuous split spoon samples were obtained from ground surface to the top of competent bedrock through the augers with a 2-inch O.D. 27 inch long steel split spoon as per ASTM D-1586. Split spoons were washed with clean water between samples, and steam cleaned between locations. The boring logs, well construction methods, and wells schematics can be found in Appendices B & C.

3.4.1.1: Supplemental Soil Borings

On September 18, 1996 nine supplemental soil borings were performed on site with the NYSDEC truck mounted drill rig to better define the extent of soil contamination. A 2-inch O.D. 27 inch long steel split spoon was used to obtain soil samples through 6 1/4 - inch I.D. hollow stem auger augers. Borings were advanced to a depth of 10 feet and a total of ten soil samples were taken to the NYSDEC laboratory in Saratoga for analysis. The locations of the nine supplemental soil borings are shown on Figure 20. The grey sludge material found during the test pit investigation in April 1996 was not found in the borings. However several samples from the bottom of sand and gravel unit (8 to 10 feet) above the till contact had a chemical odor. The locations of the supplemental soil borings are shown on Figure 20. A summary of the analytical results from the supplemental soil borings is shown on Table 9.

3.4.2: Monitoring Well Development

The new monitoring wells were developed following installation. Each well was left undisturbed for 48 hours before development to ensure that the cement/bentonite grout set up.

Development was accomplished using a 1 horsepower submersible Grundfos pump. Development was considered complete when the pH, specific conductivity, turbidity, and temperature stabilized; or the well was repeatedly pumped dry. Stability is defined as variation of 10 percent or less between measurements and no overall upward or downward trend in the measurements. A minimum of 3 well volumes was removed. Water removed during development was discharged to ground surface near the well head. A petroleum or chemical odor was noticed during the development of MW-2S.

3.4.3: Water Level Monitoring & Hydrogeology

The depth to groundwater was measured in all wells from the top of riser using an electric water level meter to the nearest 0.01 feet . The groundwater elevations are shown on Table 3.

Groundwater elevation data is important because it can be used to determine the direction of groundwater flow. Elevation data from monitoring wells MW-1S, MW-2S MW-3S, and MW-4S indicate the elevation of groundwater in the shallow sand and gravel aquifer at each location, and elevation data from monitoring wells MW-1D, MW-2D, MW-3D, and MW-4D indicate the elevation of the groundwater potentiometric surface in the bedrock aquifer.

An aquifer is defined as a water-bearing layer of rock or unconsolidated material that can yield water in a usable quantity. Groundwater occurs in aquifers under two different conditions. Where water only partly fills an aquifer, the upper surface of the saturated zone rises and declines with changes in rainfall, snowmelt and seasonal conditions. The water in such aquifers is said to be unconfined, and the aquifers are referred to as unconfined or watertable aquifers. Where water completely fills an aquifer that is overlain by a confining bed, such as a clay layer, the water in the aquifer is said to be confined. Such aquifers are said to be confined or artesian aquifers.

Two aquifers were identified on site - the upper sand and gravel and the shale bedrock. The upper sand and gravel aquifer was not present at the upgradient MW-1 location (see cross sections, Figures 18 & 19). The upper sand and gravel and lower bedrock aquifer are separated by a glacial till unit. The till unit is saturated at the upgradient location and is hydrologically connected to the upper sand and gravel. On site and downgradient, the till unit functions as an aquitard. That is, it retards the flow of groundwater and separates the upper sand and gravel and lower shale bedrock aquifers.

The shallow sand and gravel aquifer is an unconfined watertable aquifer. The watertable is generally about 3 to 5 feet below grade. At the MW-1 and MW-2 locations, the bedrock aquifer is confined. However, at the MW-3 and MW-4 locations along Charles Street, conditions in the bedrock aquifer have changed, and the bedrock aquifer at these locations appears to be unconfined. This change in conditions can best be explained by the fact that groundwater in the shale bedrock occurs only in fractures, fissures and along bedding planes in the rock mass. Recharge to the bedrock aquifer occurs largely from rainwater and snowmelt infiltrating down through the glacial till covered uplands southeast of the site. It is possible that at the upgradient location, MW-1, and at MW-2 there is a shallow fracture in the bedrock that is not present further downgradient on Charles Street. This theory is also supported by the fact that MW-1D and MW-2D had slightly higher yields than MW-3D or MW-4D, and MW-2D exhibited the highest hydraulic conductivity of any bedrock well. The glacial till overburden was highly saturated at MW-1. The lower portion of the glacial till was highly saturated at MW-2, from a depth of about 12 feet to 23 feet where bedrock occurred. The till at MW-3 and MW-4 was stiff and dry under the sand aquifer and above the bedrock. This could be accounted for by water in the confined bedrock aquifer under artesian pressure being forced into the till above, rather than groundwater coming down from the shallow sand aquifer above. The Watertable Contour Maps, Figures 13 through 16, indicate the relative directions of horizontal groundwater flow. The direction of groundwater flow is perpendicular to the contour lines, generally to the west-northwest.

3.5: In-Situ Permeability Testing

Slug tests were performed on monitoring wells to determine the in-situ hydraulic conductivity, or in place permeability of the hydrostratigraphic unit. This was accomplished by analyzing the water level response in the monitoring wells following instantaneous change in water level.

In-situ permeability tests were performed on each of the monitoring wells. Tests were logged on an In-Situ Company, Inc. Hermit, Model SE1000B Data Logger. The results from the slug tests are summarized on Table 5. Well number 3D exhibited very slow recovery, and meaningful quantitative results could not be obtained from this well. The general procedure for slug testing and the slug test data are included in Appendix D & E.

3.6 Stratigraphy

The locations of the geologic cross sections are shown on Figure 17. The stratigraphy of the area is shown in Cross Sections A-A' and B-B', Figures 18 & 19. Generally, the stratigraphic column on site consists of about 9 feet of glacial river terrace sand and gravel, 12 feet of a hard, tight, brown glacial till overlying shale. The shale bedrock is a dark grey and light grey banded calcareous shale with some perpendicular quartz bedding. The glacial river terrace sand and gravel thickens slightly to the northwest, and is absent to the southeast at MW-1. Data obtained during the supplemental borings indicate that the top of the till may dip slightly to the east on site.

3.7: Groundwater Monitoring, Sampling and Analysis

Only volatile analyses using USEPA method 8240 were performed during the first round of groundwater samples taken April 22, 1996. Purging and sampling was performed according to procedures described in the Quality Assurance Procedure Plan (QAPP). Laboratory analysis of the first round soil and groundwater samples was performed at the NYSDEC Division of Environmental Remediation laboratory facilities in Saratoga with the exception of 3 on-site soil samples and 2 upgradient soil samples. These 5 soil samples were sent to a subcontracted laboratory which performed lab analyses and QA/QC procedures in accordance with 1991 NYSDEC ASP Category B deliverables. The groundwater analytical results from the first round of samples are shown on Table 6.

The second round of groundwater sampling took place on August 8, 1996. Samples were analyzed for volatile organic compounds using USEPA Method 8240. In addition, select samples were analyzed for metals, total alkalinity, total suspended solids, total dissolved solids, hardness and sulfates to aid with the evaluation of remedial alternatives in the Feasibility Study. One sample from MW-2S was analyzed at the NYSDOH Wadsworth Laboratory in Albany for ketone/petroleum identification. No ketone/petroleum compounds were identified in this sample. The groundwater analytical results for volatile organic compounds from the second round of samples are shown on Table 7. Laboratory analytical data sheets can be found in Appendix F.

A data useability survey report (DUSR) was completed by the NYSDEC Quality Assurance Officer on the data generated during the Remedial Investigation.

3.8: Contaminant Migration

When contaminants enter the soil in the unsaturated zone above the watertable, many mechanisms are at work that reduce the subsequent impact of the contaminants on the underlying groundwater. These mechanisms occur during transport and occur simultaneously. They include volatilization, sorption and desorption, leaching, diffusion, transformation, degradation, and mixing with the groundwater surface. Once contaminants reach the watertable, they can migrate from the site to off-site areas by the movement of groundwater.

Groundwater under the site occurs in the three stratigraphic units that underlie the site; the upper sand and gravel unit, the glacial till unit, and the underlying shale bedrock. It is believed that the primary contaminant of concern, PCE, entered the ground as a component of dry cleaning fluid contained in lint washed from lint filters and in wash water or "grey water" discharged during the cleaning operations. The PCE can then chemically degrade over time and form other volatile organic compounds referred to as breakdown products, primarily TCE and 1,2-DCE. These volatile organic compounds are washed down to the watertable or saturated zone, then move through the ground vertically and horizontally with groundwater. Soils both above and below the watertable can be contaminated as residual amounts of contaminants are absorbed by and adhere to soil particles.

Although no grey sludge was found in the nine supplemental borings, some small amounts of grey sludge material containing high levels of contaminants may remain on site behind the old foundation. Sample number TB-4B, which contained some of the sludge material, had 4,100 ppb PCE (Table 8). The absence of fine grained soils and the relatively high permeability of the sand and gravel results in relatively low levels of contaminants retained in most of the shallow on-site soils above the watertable. Except for the grey sludge, analytical results indicate that highest levels of contaminated soil are below the watertable and localized to the area beneath the eastern side of the old foundation. Based on the data collected in MW-2s, the PCE concentration in soil beneath the watertable was roughly three times higher than the PCE concentration in the water.

As PCE entered the upper shallow sand and gravel aquifer from discharge on site, it migrated to the west-northwest in the aquifer with groundwater. Although the upper sand and gravel aquifer is very permeable at the site, estimates of the rate of groundwater movement are low because of the very low gradient that exists. Estimates of groundwater flow rates for groundwater moving from the site toward Charles Street range from about 6.5 to 16 feet per year. Given that PCE could have been introduced to the groundwater over the thirty year period of the dry cleaning operation, from the mid 1940's to the mid 1970's, the leading edge of a plume of contaminated groundwater in the upper sand and gravel aquifer could have migrated approximately 800 feet downgradient, using the higher estimate of groundwater flow of 16 feet per year. However the effects of wells pumping in the aquifer over the years could have had a significant effect on flow rates. Wells pumping from the aquifer could have drawn contaminated ground water in the downgradient area causing the area of contaminated groundwater to become more widespread.

Assuming an area of the upper sand and gravel aquifer of 300 feet by 500 feet has 100 ppb PCE, and an average saturated thickness of 2.4 feet, there would be 360,000 cubic feet of sand and gravel aquifer with groundwater that contains 100 parts per billion of PCE. Assuming a porosity of 30%, this would equate to approximately 0.67 pounds of pure PCE or about 11 ounces by volume. Assuming an area of the upper sand and gravel aquifer of 150 feet by 300 feet has 200 ppb PCE, and an average saturated thickness of 2.4 feet, 108,000 cubic feet of sand and gravel aquifer would have groundwater with 200 parts per billion of PCE. This would equate to approximately 4/10 of a pound, or about 6 ½ ounces by volume of pure PCE in that portion of the aquifer.

As discussed in Section 3.4.3 above, groundwater in the the bedrock aquifer is confined at the site. The water in the bedrock aquifer underlying the site is under piezometric pressure, and the potentiometric surface, that is the surface that represents the total head within the aquifer, is well up into the till unit. This acts as a natural hydraulic barrier to the downward migration of groundwater and contamination from above.

Although gradients are higher in the bedrock aquifer, the hydraulic conductivities are low. Therefore, estimates of the rate of groundwater movement in the bedrock aquifer are very low, on the order of 1 to 2 feet per year. However, as with the upper sand and gravel aquifer, the effects of wells pumping in the bedrock aquifer over the years would likely have had a significant effect on flow rates. It is also important to note that flow in the bedrock regime is significantly different than in unconsolidated deposits. Groundwater occurs in thin bedding planes, fractures and fissures within the massive bedrock. Estimates of hydraulic conductivity in the bedrock represent averages over the open hole rock column. The actual hydraulic conductivity in a fracture could be very high, while the hydraulic conductivity in the solid massive rock is essentially zero.

As can be seen on Figures 15 & 16, groundwater flow in the bedrock aquifer is toward the west-northwest. However, in general regional bedrock fractures tend to strike from the southwest to the northeast. This fact could help account for trace levels of PCE in bedrock wells on the south end of State Street.

Although no contamination was detected in MW - 2D, trace or low levels of PCE and breakdown products have been detected in approximately 20 residential bedrock wells in the Village, including the on-site residential supply well. Contamination in the on-site residential well could be accounted for by leakage along the steel casing, which is not grouted and sealed in a bedrock socket. When the well is pumped for residential use, the potentiometric surface is depressed around the well. A narrow cone of depression forms rapidly due to the withdrawal of water, providing a conduit for leakage from above. Once the contaminants are in the fractures and fissures in the bedrock, they can move along fractures with groundwater flow which may be influenced by other bedrock wells pumping in the area. The pumping of other downgradient bedrock wells could also provide pathways for contaminants by leakage along casings into the bedrock from the upper sand and gravel unit above.

Another way that contaminants could, over time, migrate down into the bedrock is leakage through the till unit downgradient of the site. As is mentioned in Section 3.4.3 above, the bedrock aquifer is confined at the site, but is unconfined at MW-3D and MW-4D on Charles Street. Although the hydraulic conductivity of the till is low, and the till unit would generally retard the movement of groundwater, till is not homogeneous, and leakage from the upper sand and gravel above through the till could occur between the site and Charles Street.

An estimate of the area of groundwater contamination in the upper aquifer that is greater than 10 ppb is shown on Figure 12.

Hydrocarbons were also detected in the soil on-site, but not in the groundwater. Hydrocarbons seemed to be concentrated in the sand and gravel just above the till contact to the east of the abandoned 1000 gallon oil tank below the foundation.

3.9: Human Exposure Evaluation

As part of the Remedial Investigation, the NYSDOH evaluated existing and possible human exposure routes to site contaminants. The Exposure Pathways Assessment is attached as Appendix G.

3.10: Site Mapping and Surveying

Upon completion of sampling activity, the locations of each of the sampling points were established on a base map by a New York State licensed surveyor. Elevations of all monitoring well casings and the corresponding locations were determined to within 0.01 feet, based on a USGS datum, and added to a base map. The survey field work was completed by the DEC on June 6, 1996 in accordance with DEC survey standards and guidance.

In addition, groundwater elevation data and plume locations delineated by groundwater monitoring well data were graphically represented on separate editions of the basemap.

SECTION 4.0: SUMMARY & CONCLUSIONS

In summary, the presence of two aquifers were confirmed underlying the site area. The upper sand and gravel aquifer is unconfined, and the lower shale bedrock aquifer is confined upgradient and under the site, but unconfined downgradient of the site. The two aquifers are separated by a glacial till aquitard. Groundwater flow is toward the west-northwest in both aquifers, with a slightly more westerly component of flow in the bedrock aquifer. Both aquifers exhibit low levels of contamination from the former dry cleaning operation. Concentrations of VOCs in the upper sand aquifer ranged from 350 ppb on site and 104 ppb at MW-4s on Charles Street in front of the Village Office, to 12 ppb at MW-3s. Bedrock wells MW-3D and MW-4D located on Charles Street exhibited low levels of contamination, with 12 ppb and 2 ppb of PCE. There are two ways that contaminants could, over time, migrate from the upper sand and gravel aquifer down into the bedrock. One is by leakage along the steel casing of residential wells which are not grouted and sealed in a bedrock socket, and the second is by leakage through the glacial till unit downgradient of the site.

Concentrations of PCE and its breakdown products, TCE and cis-1,2DCE were detected in on-site soils. Concentrations ranged from non-detect to 170,000 ppb of PCE. Analytical results indicate that highest levels of contaminated soil are below the watertable and localized to the area beneath the eastern side of the old foundation. Based on the data collected onsite, the PCE concentration in soil beneath the watertable is roughly three times higher than the PCE concentration in the water. Although no grey sludge was found in the nine supplemental borings, some small amounts of grey sludge material containing high levels of contaminants may remain on site behind the old foundation. A soil sample that exhibited 4,131 ppb contained some of the grey sludge like material.

The Water-Soil Equilibrium Partition Theory was applied to develop a site specific soil cleanup objective. The soil clean up objective for PCE developed for the Valley Falls site is 0.84ppm.

Figure 21 shows a summary of the on-site soil sample analytical results. An estimated area of soil with contamination above the site clean up level is also shown on Figure 21. In this area, soil below the water table at the base of the sand and gravel unit may to be contaminated with PCE at levels above 0.84 ppm. This area of soil is at a depth of about 6 feet to 9 feet. Analytical data indicates that most of the soil above this depth interval in this area has much lower or trace levels of PCE. The amount of soil above 0.84 ppm is estimated to be about 75 cubic yards.

An underground 1000 gallon fuel storage tank was discovered on site. Half of the tank is under the old foundation. The tank contains approximately 200 gallons of what is most likely dilute number 2 fuel oil. The tank may have leaked, as a fuel oil odor was detected in the MW-2S cuttings and development water. However, no evidence of fuel oil was detected in the groundwater analytical results. Straight-chained hydrocarbons and polycyclic aromatic hydrocarbons (PAHs) were detected in the soil on site. They seemed to be concentrated below the watertable and above the till contact in the sand and gravel just east of the abandon 1000 gallon oil tank below the foundation. The boring data indicated that the top of the till may dip slightly to the east.

A 9 foot by 6 foot cinder block dry well was also unearthed behind the old foundation. The dry well is connected to the old collapsed steel septic tank. Concentrations of PCE in sediment and soil samples taken from the bottom and side of the cinder block dry well ranged from 90 ppb to 470 ppb.

The residential well sampling results indicate wide spread low levels of PCE in the groundwater downgradient of the site. Seven residential wells have concentrations of PCE in excess the NYSDOH maximum contaminant level of 5 ppb. Two of these wells are completed in the upper sand and gravel and five are completed in the bedrock. The highest concentration of PCE detected in a residential well, 210 ppb in 1993, was detected in a well completed in the upper sand and gravel aquifer next to the site. Activated carbon treatment systems have been installed on all of these wells. Additional conclusions and recommendations to minimize human exposure to the contamination associated with the site can be found in the Exposure Pathways Assessment, Appendix G.

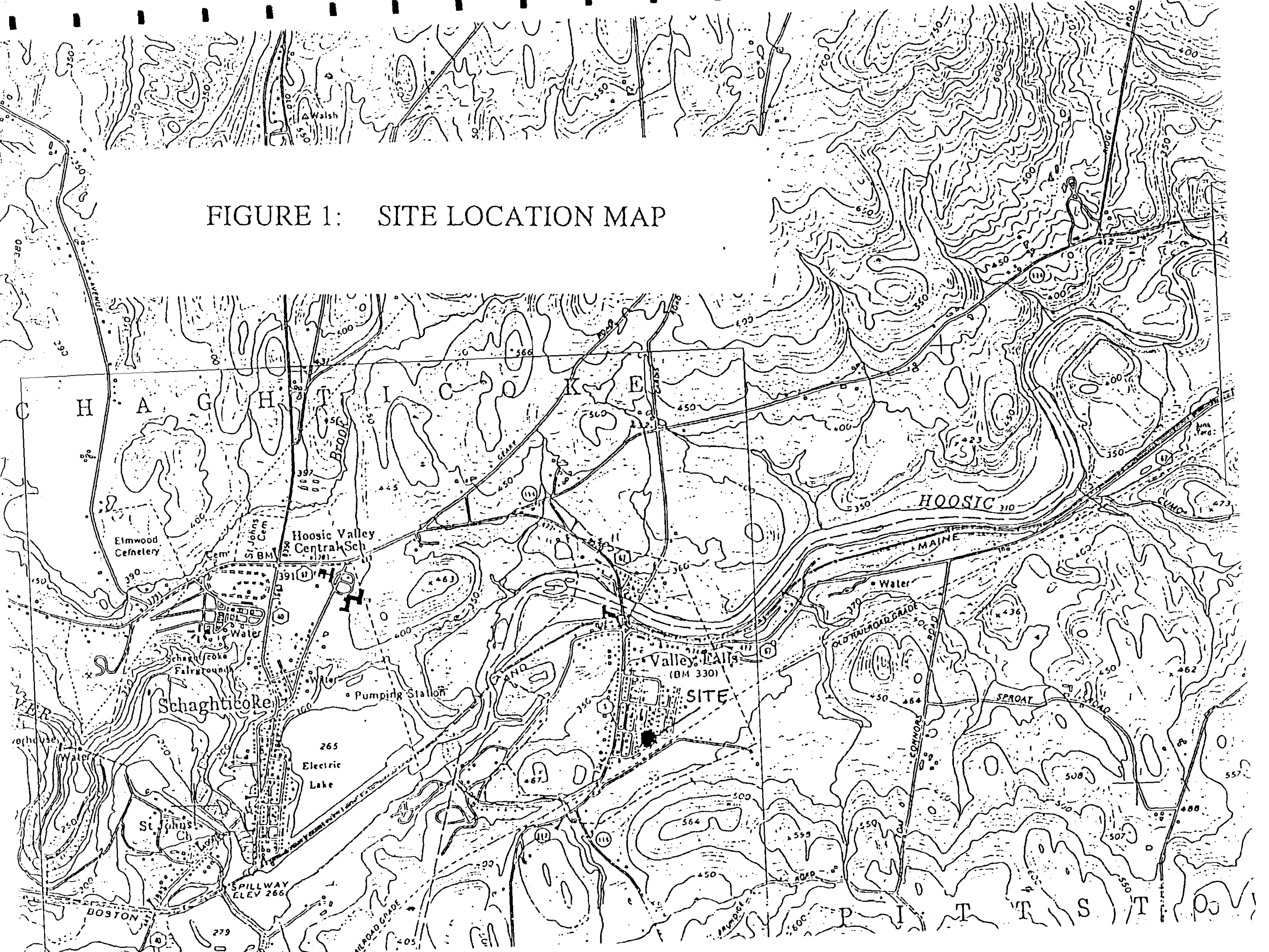
SECTION 5.0: PUBLIC PARTICIPATION

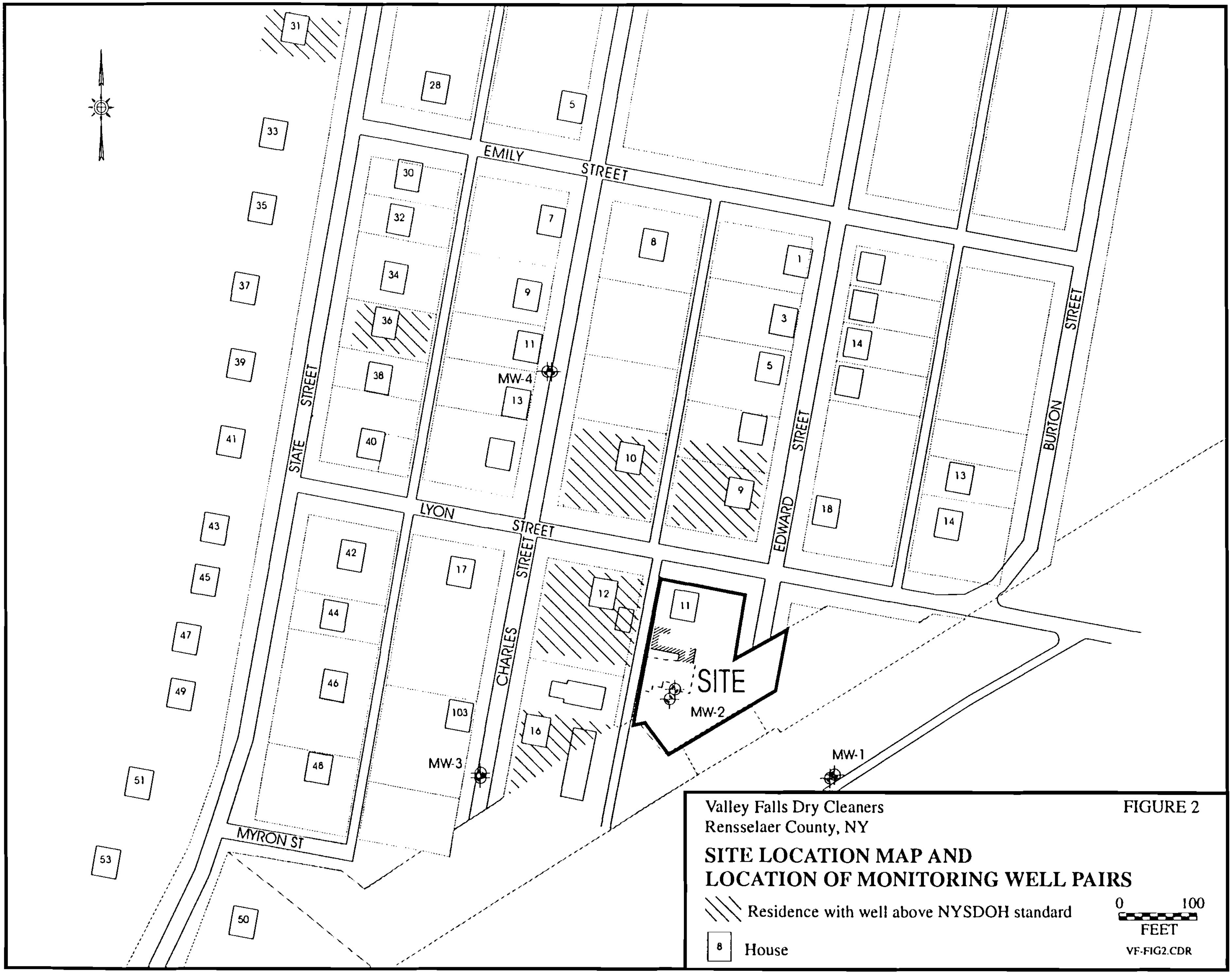
Community participation is a key component of the State's Hazardous Waste Remedial Program. In order to inform the public and solicit public comment, a public meeting was held on November 27, 1995 at the Valley Falls Village Community Center before the field work for the Remedial Investigation was initiated. The Workplan was made available at the Village Office and the Village Free Library. Nearby residents, members of the community, and the local media were contacted by mail and invited to attend. At the meeting, a discussion of the elements of the Remedial Investigation were presented in detail. Information concerning past operations and activities at the former dry cleaning operation was solicited from the public.

Once the Feasibility Study has been completed, a Proposed Remedial Action Plan (PRAP) will been prepared. The Feasibility Study will evaluate remedial alternatives against a number of factors including effectiveness, implementability, protectiveness, compliance with standards and guidance, reliability, cost, and technical feasibility. The PRAP will summarize the findings of the Remedial Investigation and the Feasibility Study, explain the remedial alternative proposed by the State as well as the reasons for proposing the alternative. The PRAP will also establish a thirty day public comment period. A public meeting will be held during that period by the NYSDEC and the NYSDOH to discuss the findings of the Remedial Investigation and the Feasibility Study, answer questions, and solicit public comments on the proposed remedy.

FIGURES

FIGURE 1: SITE LOCATION MAP





Valley Falls Dry Cleaners
Rensselaer County, NY

FIGURE 2

SITE LOCATION MAP AND LOCATION OF MONITORING WELL PAIRS

VF-FIG2.CDR

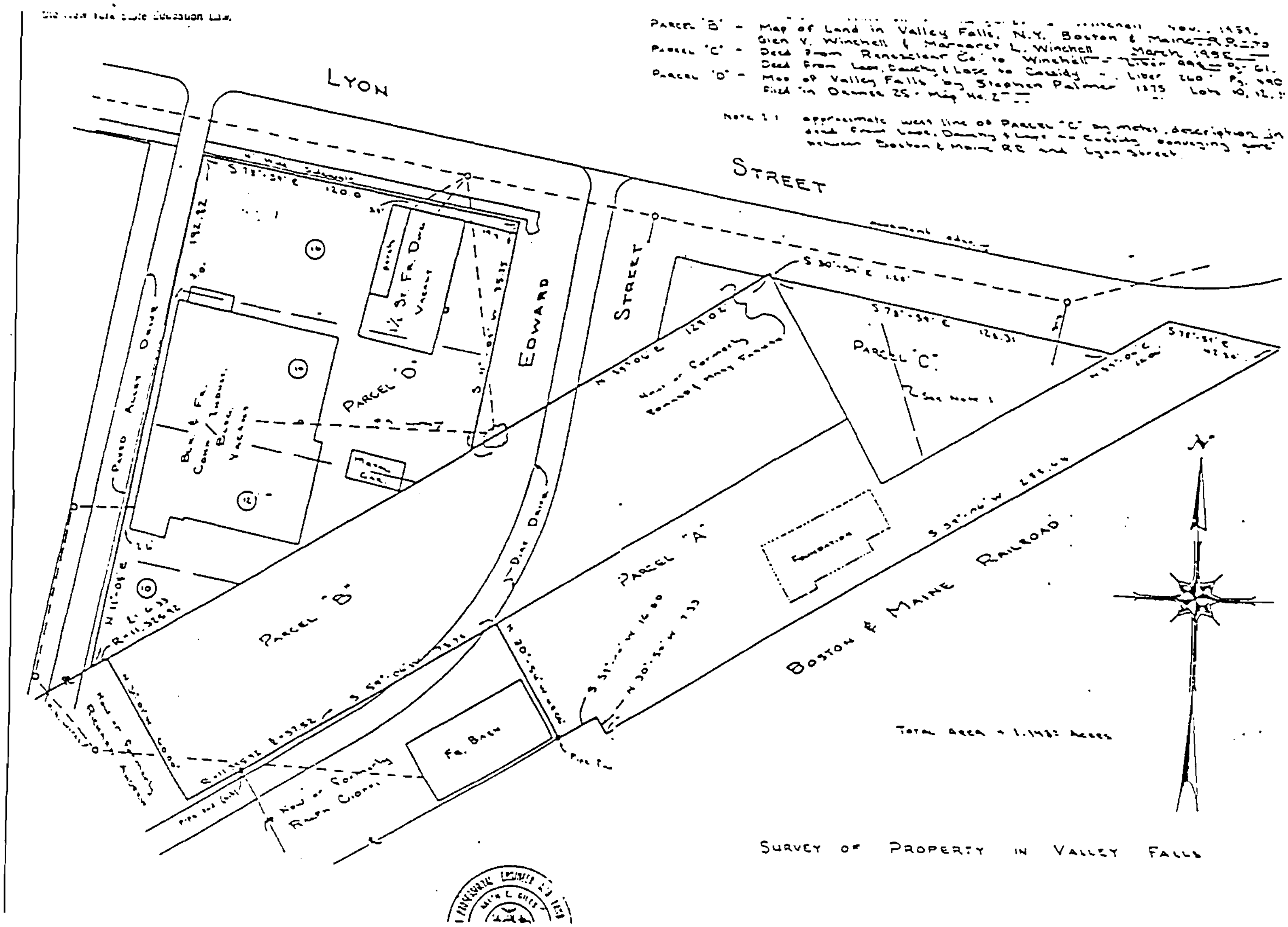


FIGURE 3: PROPERTY SURVEY INCLUDING SITE

Valley Falls Dry Cleaner
Site ID No. 442028

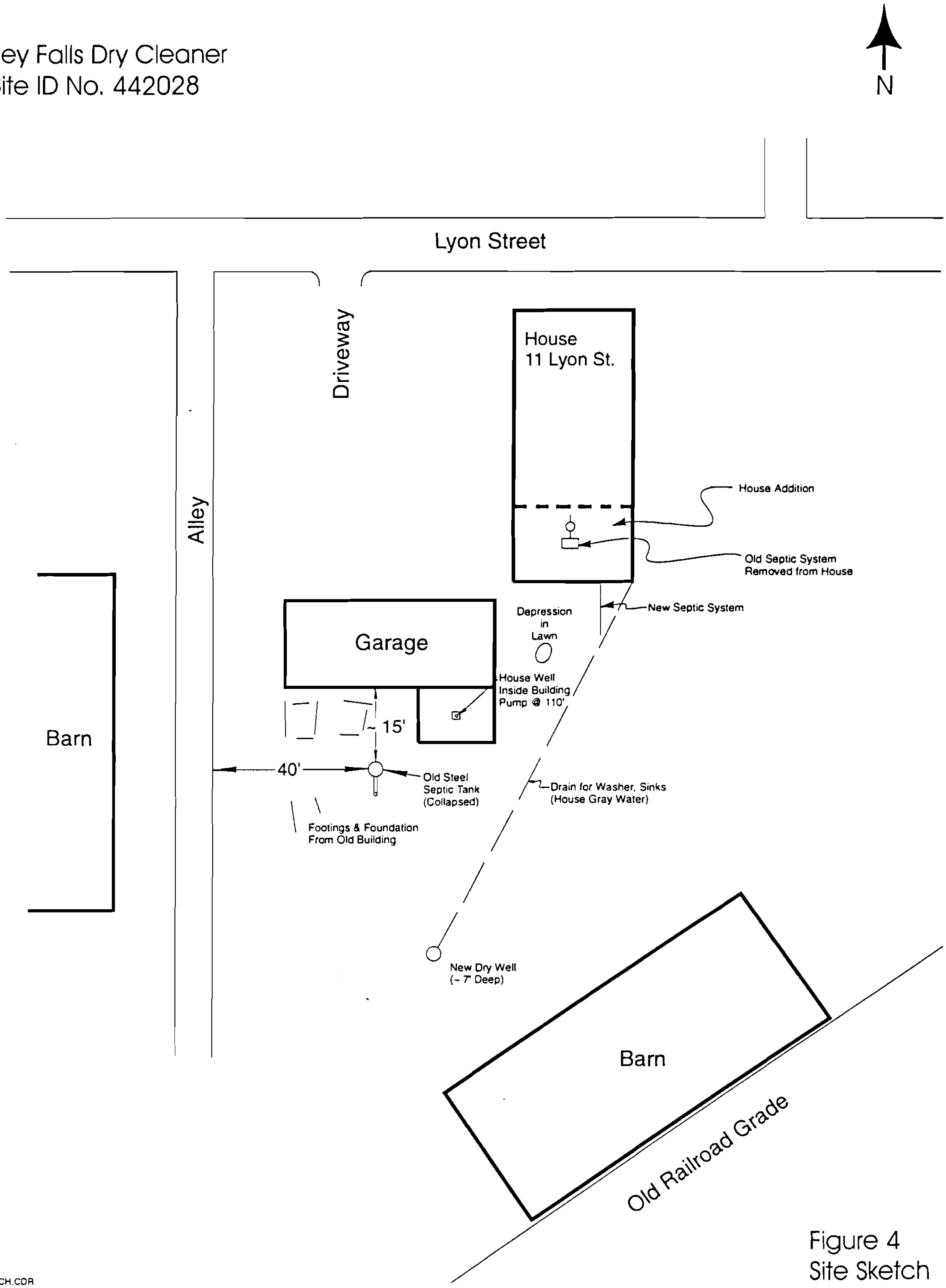
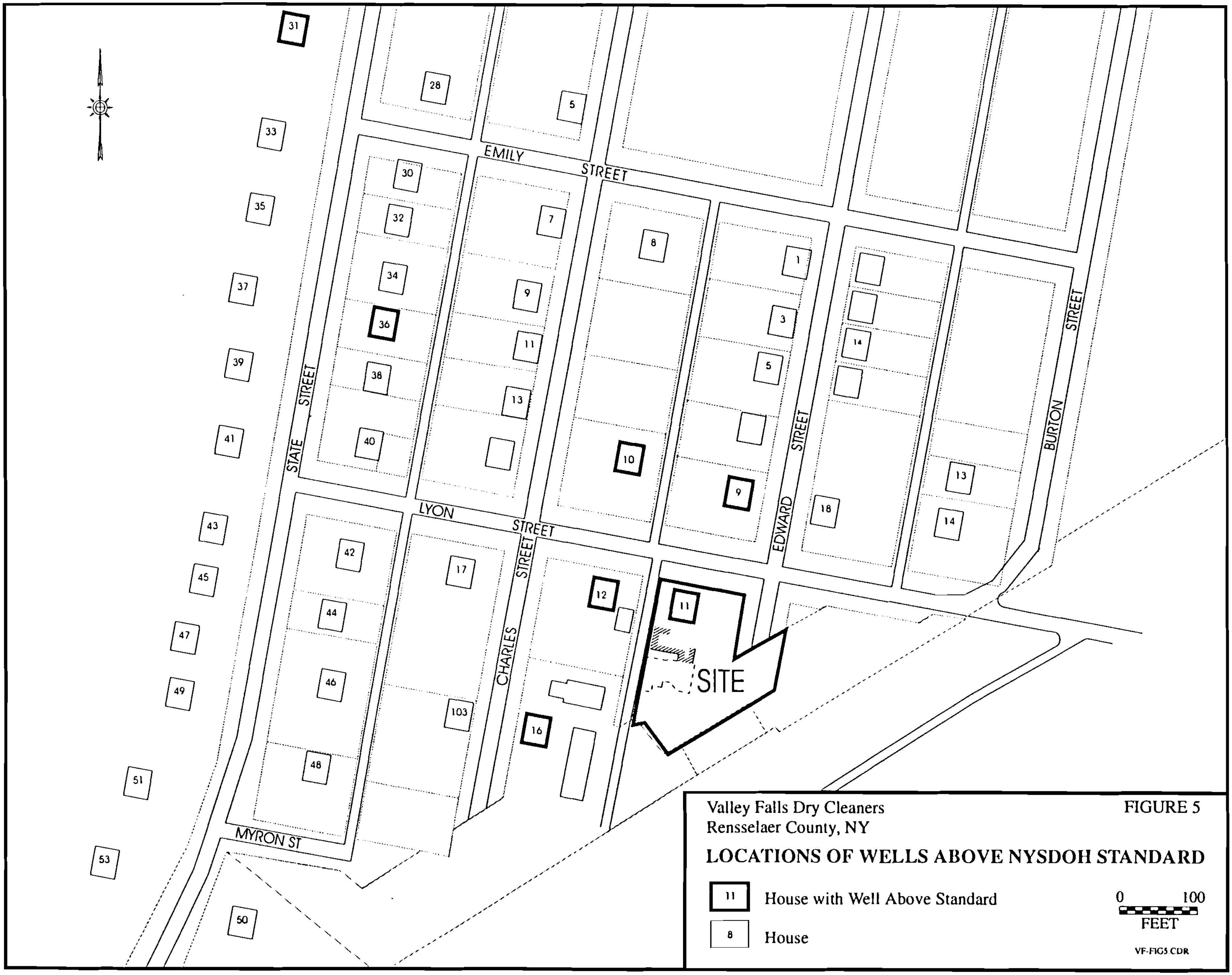


Figure 4
Site Sketch

SITSKTCH.CDR



Valley Falls Dry Cleaners
Rensselaer County, NY

FIGURE 5

LOCATIONS OF WELLS ABOVE NYSDOH STANDARD

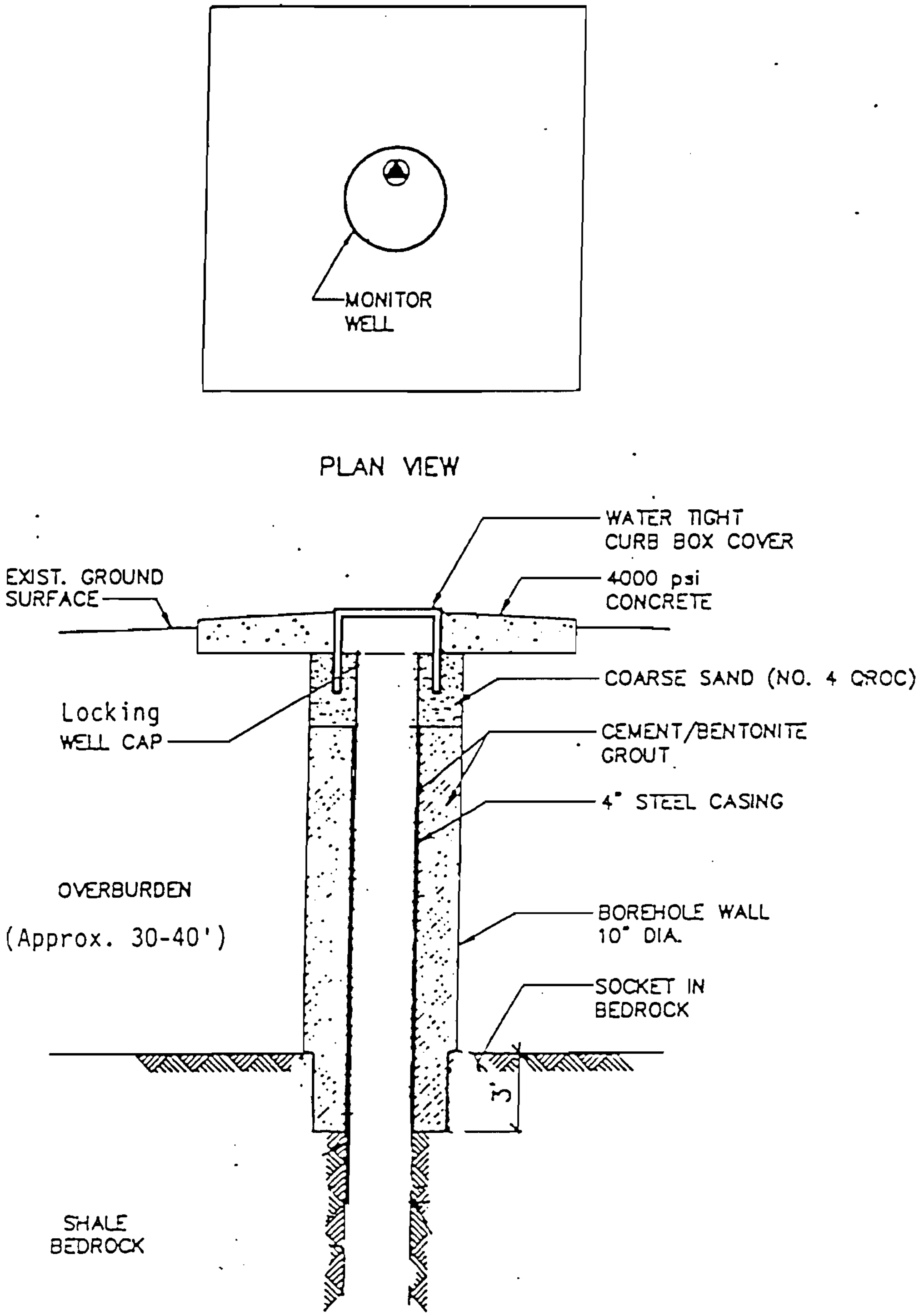
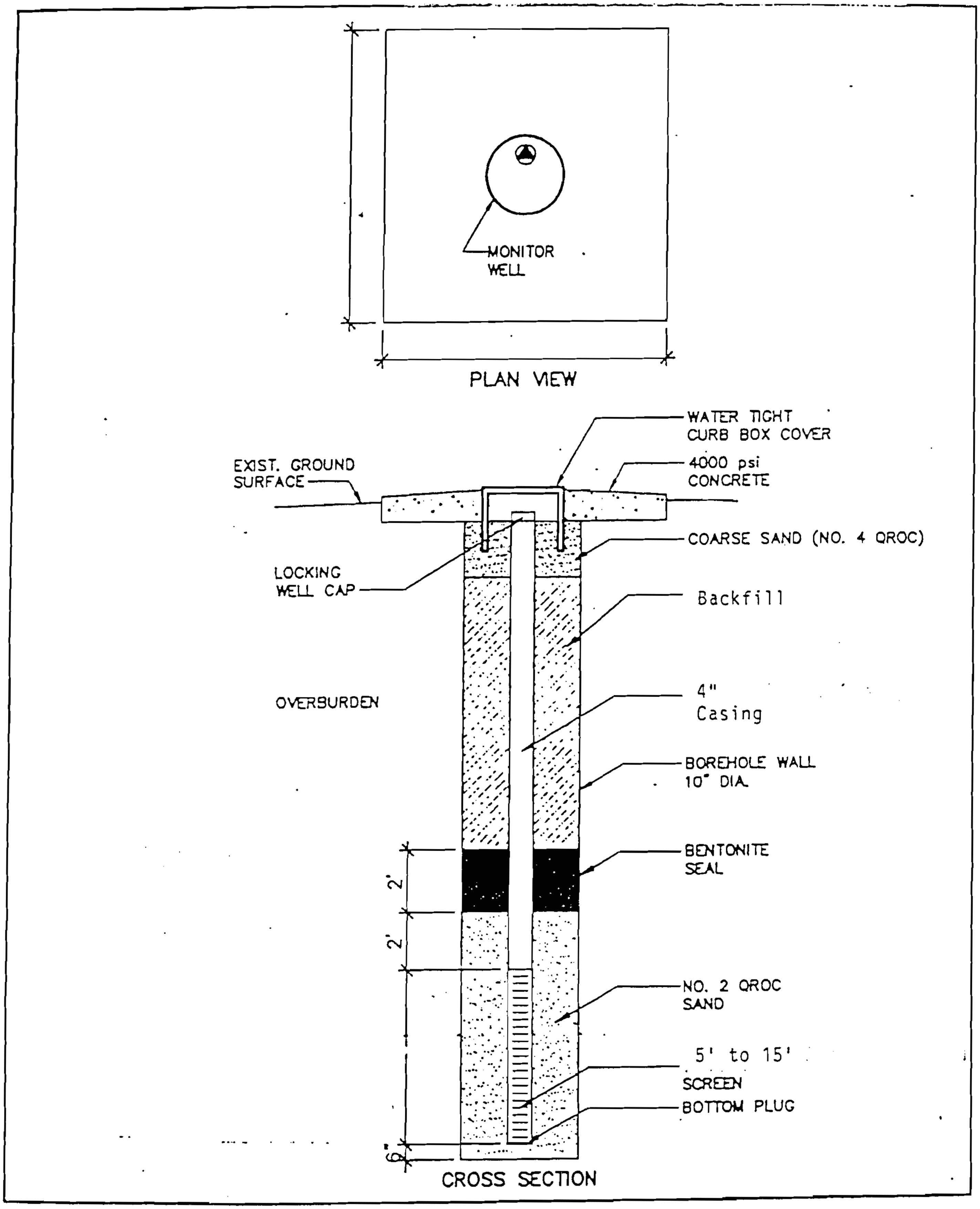


FIGURE 6: BEDROCK WELL CONSTRUCTION

CROSS SECTION

Valley Falls DryCleaner Site #442028
BEDROCK WELL CONSTRUCTION

NYSDEC



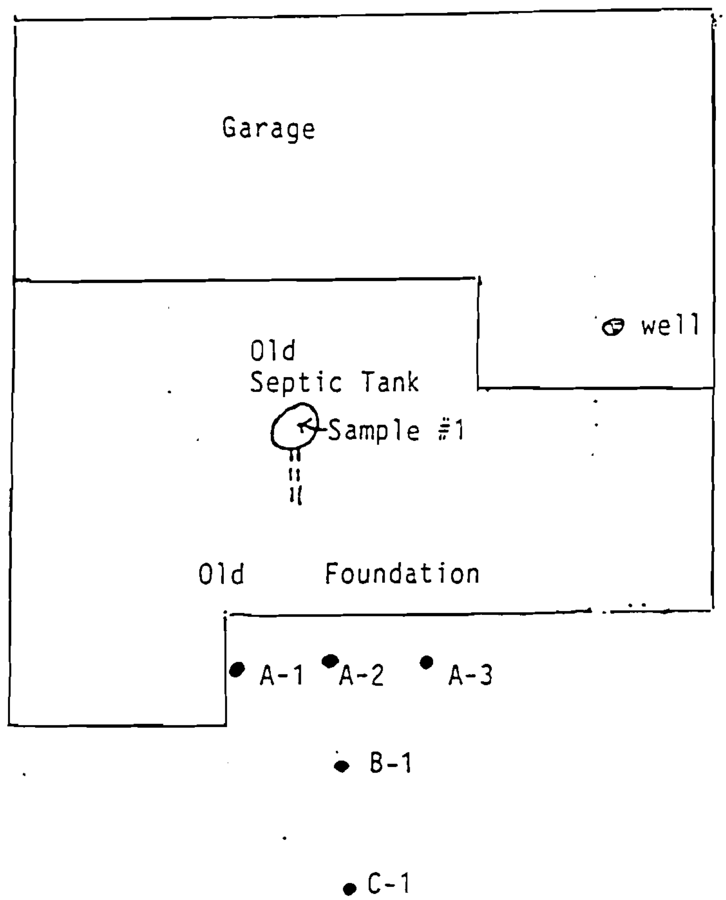
Valley Falls DryCleaner Site #442028

OVERBURDEN WELL CONSTRUCTION

FIGURE 7: OVERBURDEN WELL CONSTRUCTION

Valley Falls Dry Cleaner
Site No. 442028

Pre-RI Sampling



Summary of Analytical Results
(taken 9/18/95)

Water

Sample #1 - PCE - 8 ppb
TCE - 2 (j) ppb
CIS-1,2, dichloroethene 1 (j) ppb

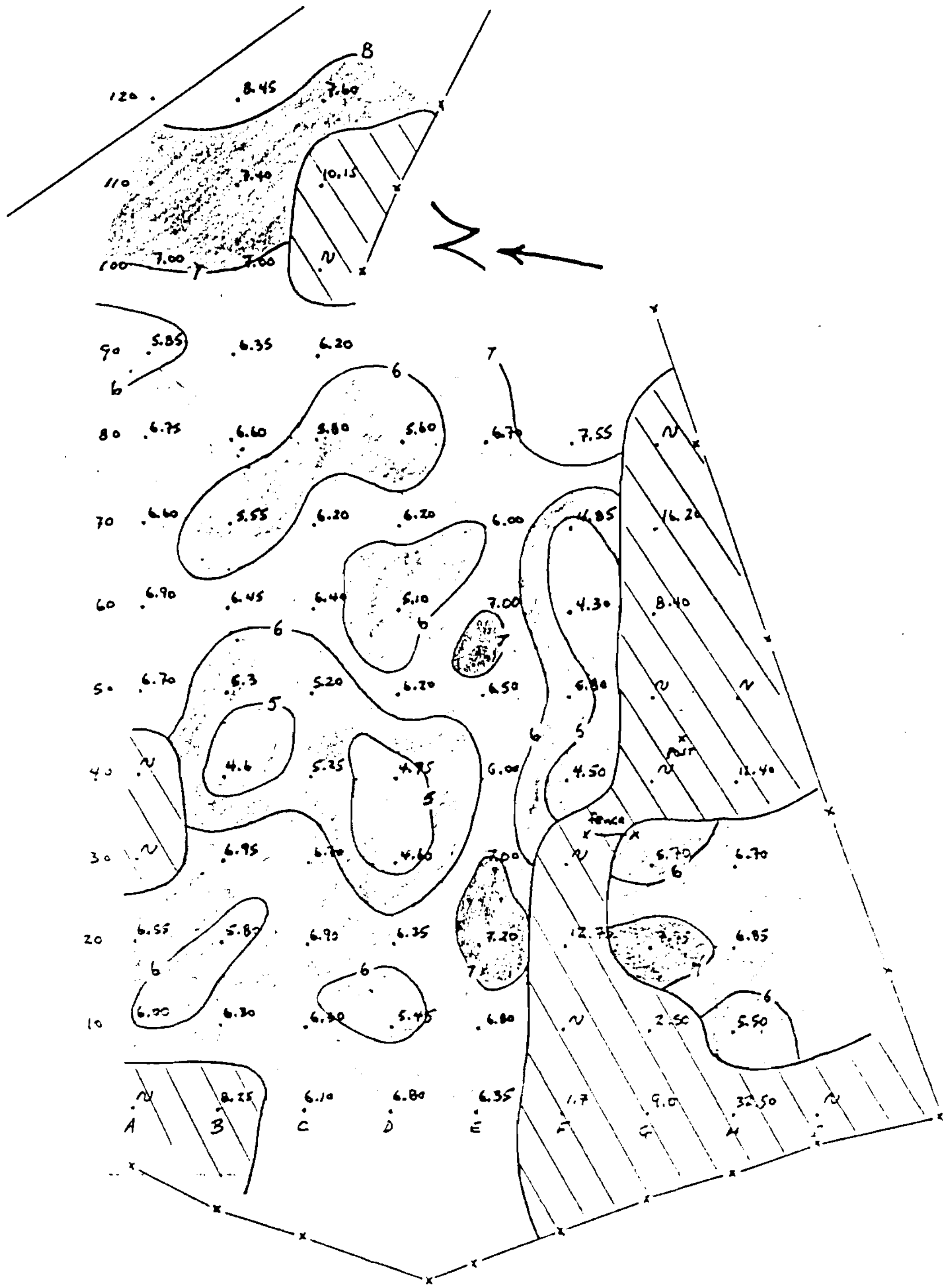
Soil

A-1 - PCE - 18 ppb
B-1 - PCE - 58 ppb
C-1 - PCE - 3 (j) ppb
A-2 - PCE - 27 ppb
A-3 - PCE - 36 ppb

FIGURE 8: VALLEY FALLS SAMPLING RESULTS SEPTEMBER 18, 1995

FIGURE 9

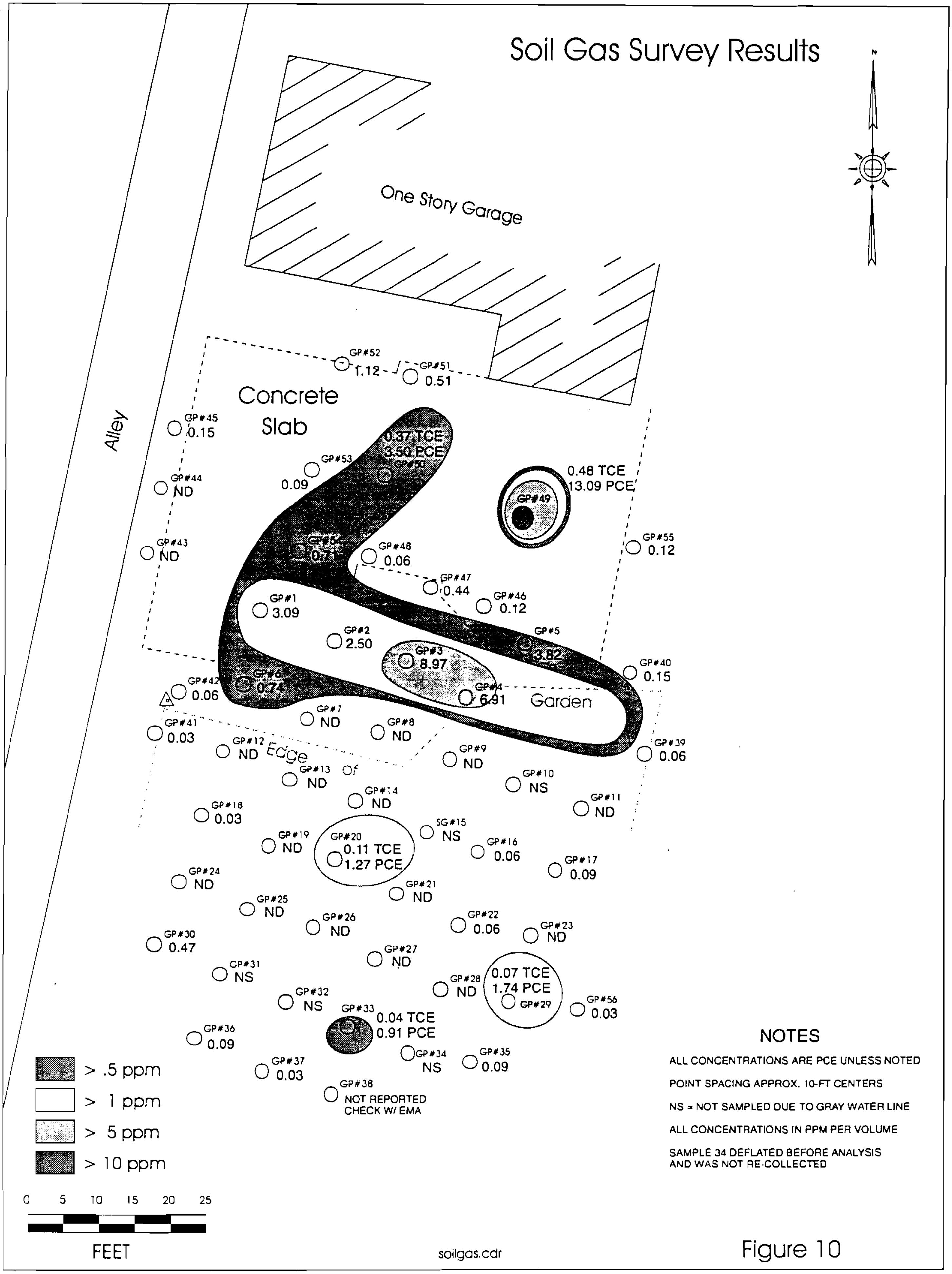
Terrain Conductivity Survey Results



Units in mmhos
C.I. = 1

Interference due to Near surface metal or cultural features

SCALE 1" = 20'



NOTES

ALL CONCENTRATIONS ARE PCE UNLESS NOTED

POINT SPACING APPROX. 10-FT CENTERS

NS = NOT SAMPLED DUE TO GRAY WATER LINE

ALL CONCENTRATIONS IN PPM PER VOLUME

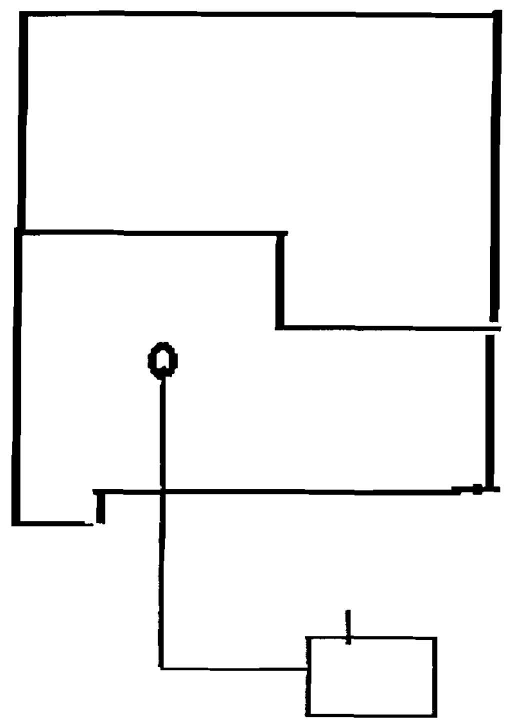
SAMPLE 34 DEFLATED BEFORE ANALYSIS AND WAS NOT RE-COLLECTED

soilgas.cdr

Figure 10

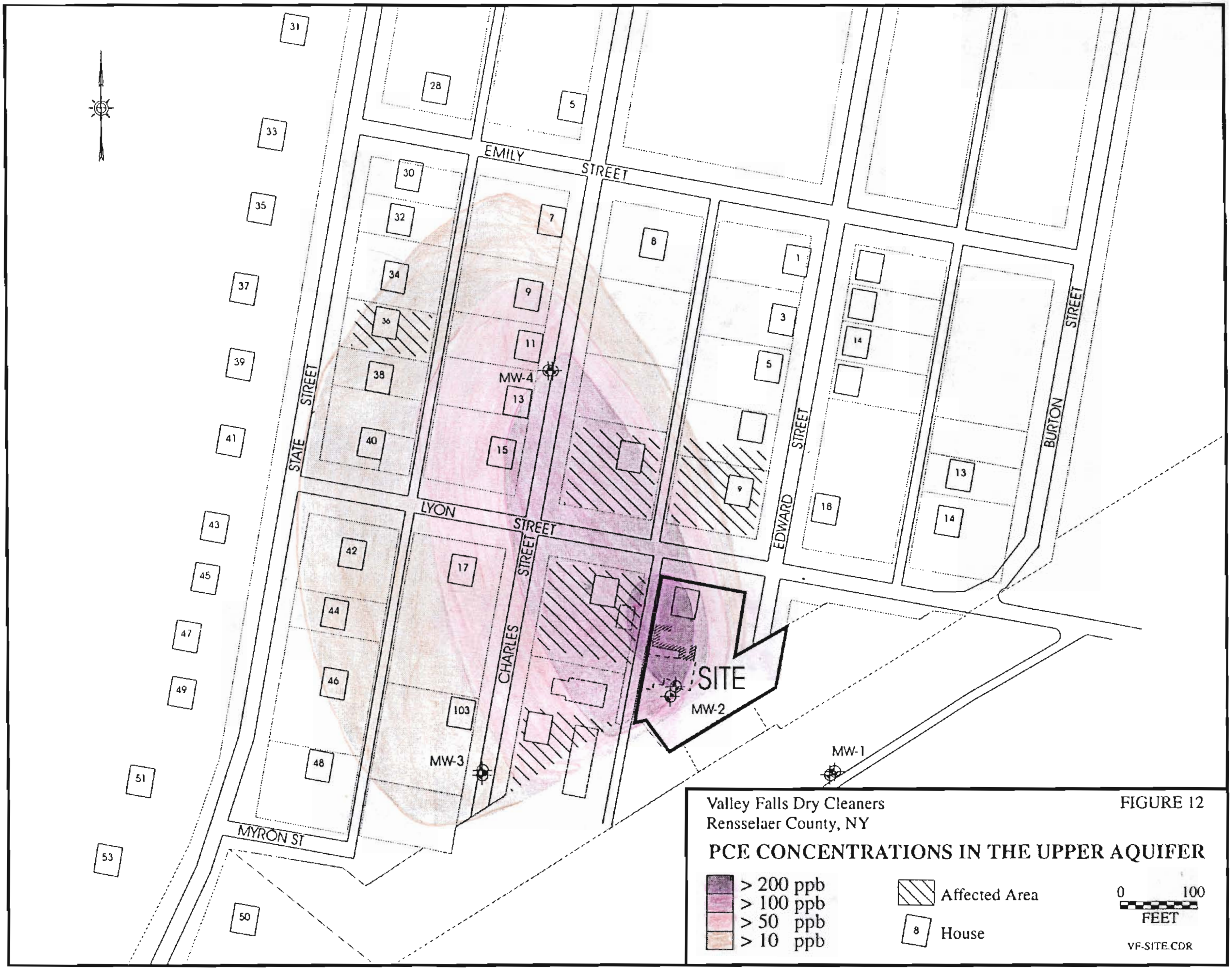
VALLEY FALLS DRY CLEANER

ABANDON SEPTIC LAYOUT



4 INCH CLAY PIPE (INSIDE 8 INCH CLAY PIPE BEHIND FOUNDATION), EXTENDS STRAIGHT 33.4 FEET, 90^0 ELBOW, 9.3 FEET TO 9’ X 6’ CONCRETE BLOCK DRY WELL

FIGURE 11



Valley Falls Dry Cleaners
Rensselaer County, NY

FIGURE 12

PCE CONCENTRATIONS IN THE UPPER AQUIFER

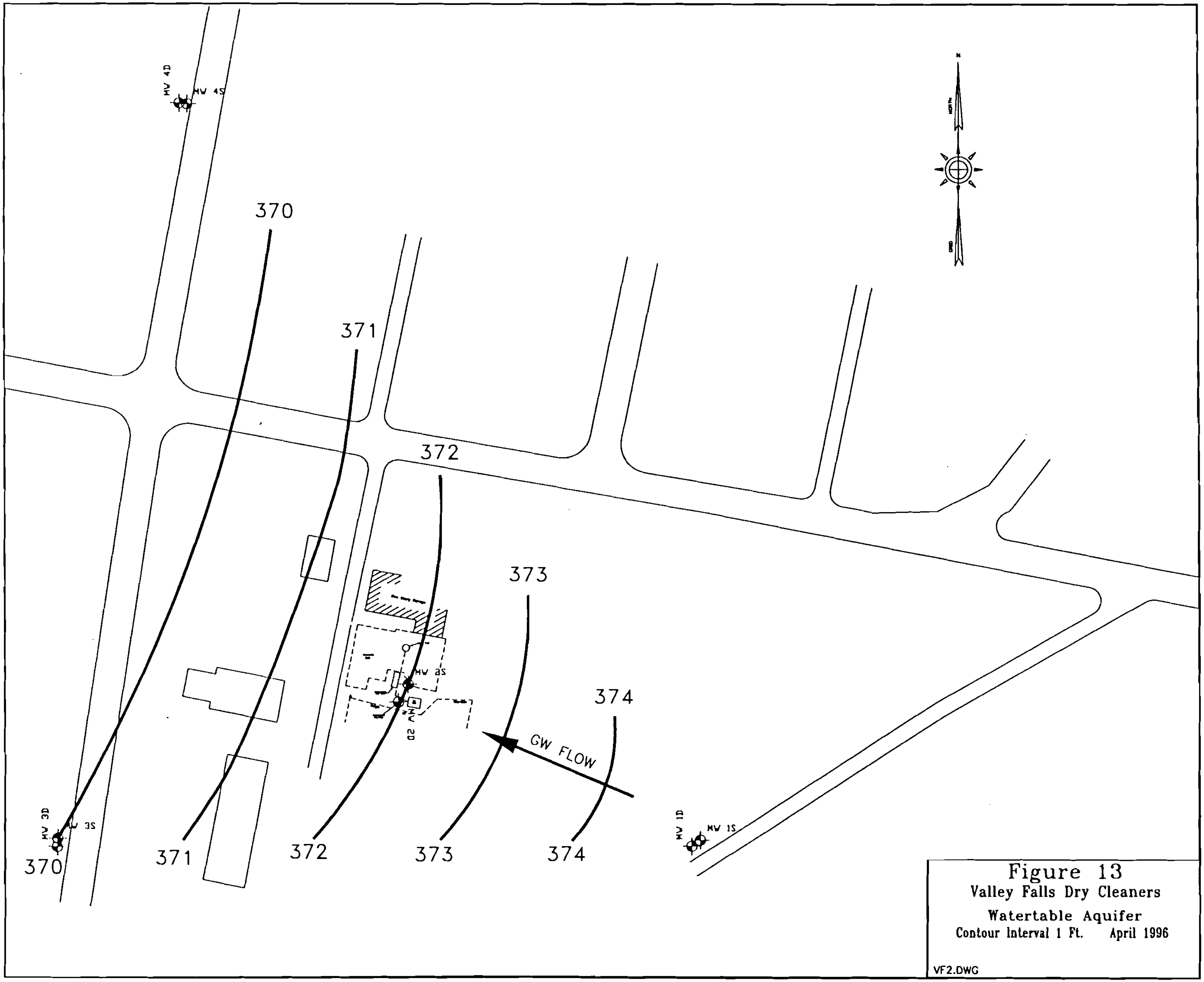


Figure 13
Valley Falls Dry Cleaners
Watertable Aquifer
Contour Interval 1 Ft. April 1996

VF2.DWG

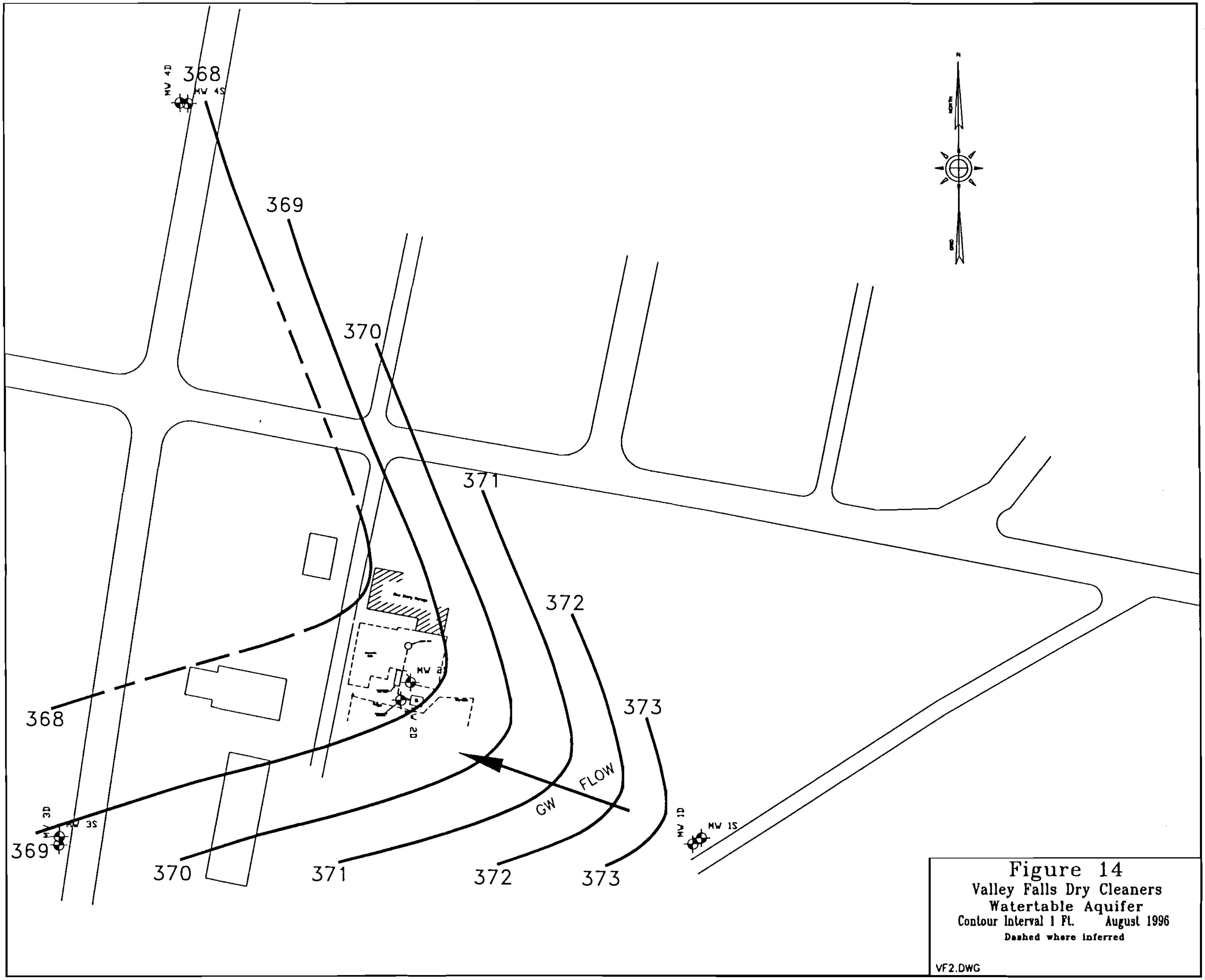


Figure 14
Valley Falls Dry Cleaners
Watertable Aquifer
Contour Interval 1 Ft. August 1996
Dashed where inferred

VF2.DWG

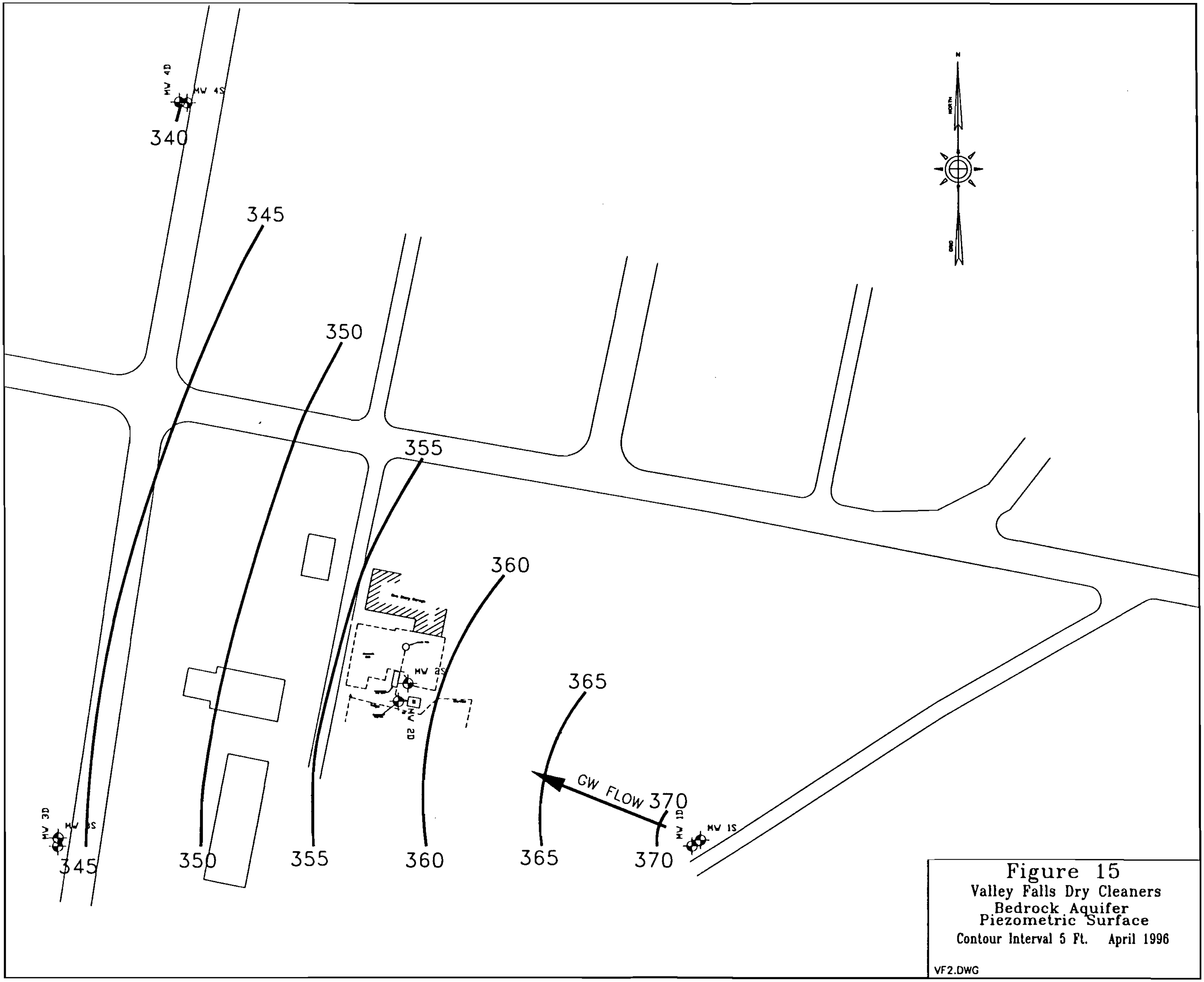


Figure 15
Valley Falls Dry Cleaners
Bedrock Aquifer
Piezometric Surface
Contour Interval 5 Ft. April 1996

VF2.DWG

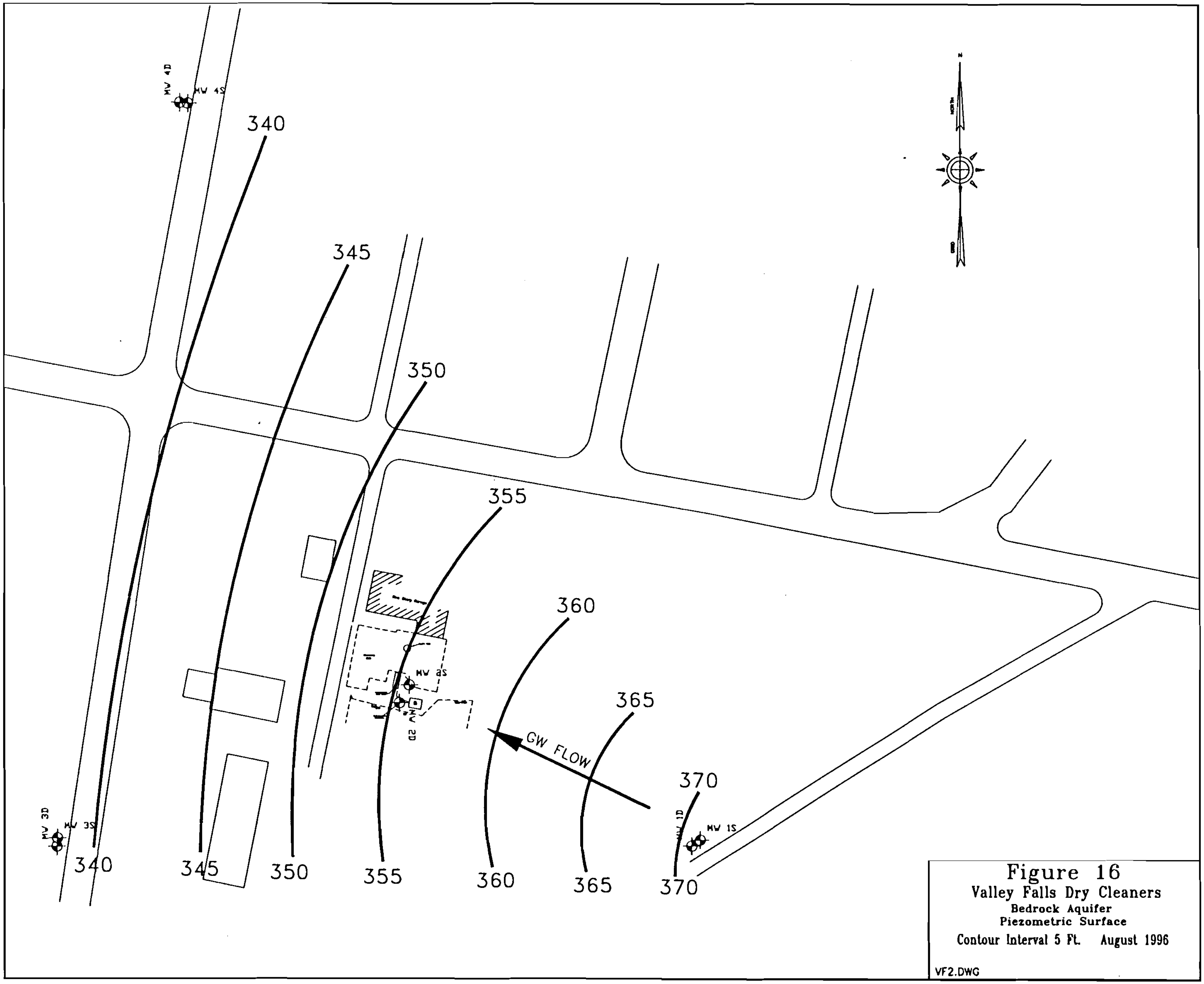


Figure 16
Valley Falls Dry Cleaners
Bedrock Aquifer
Piezometric Surface
Contour Interval 5 Ft. August 1996

VF2.DWG

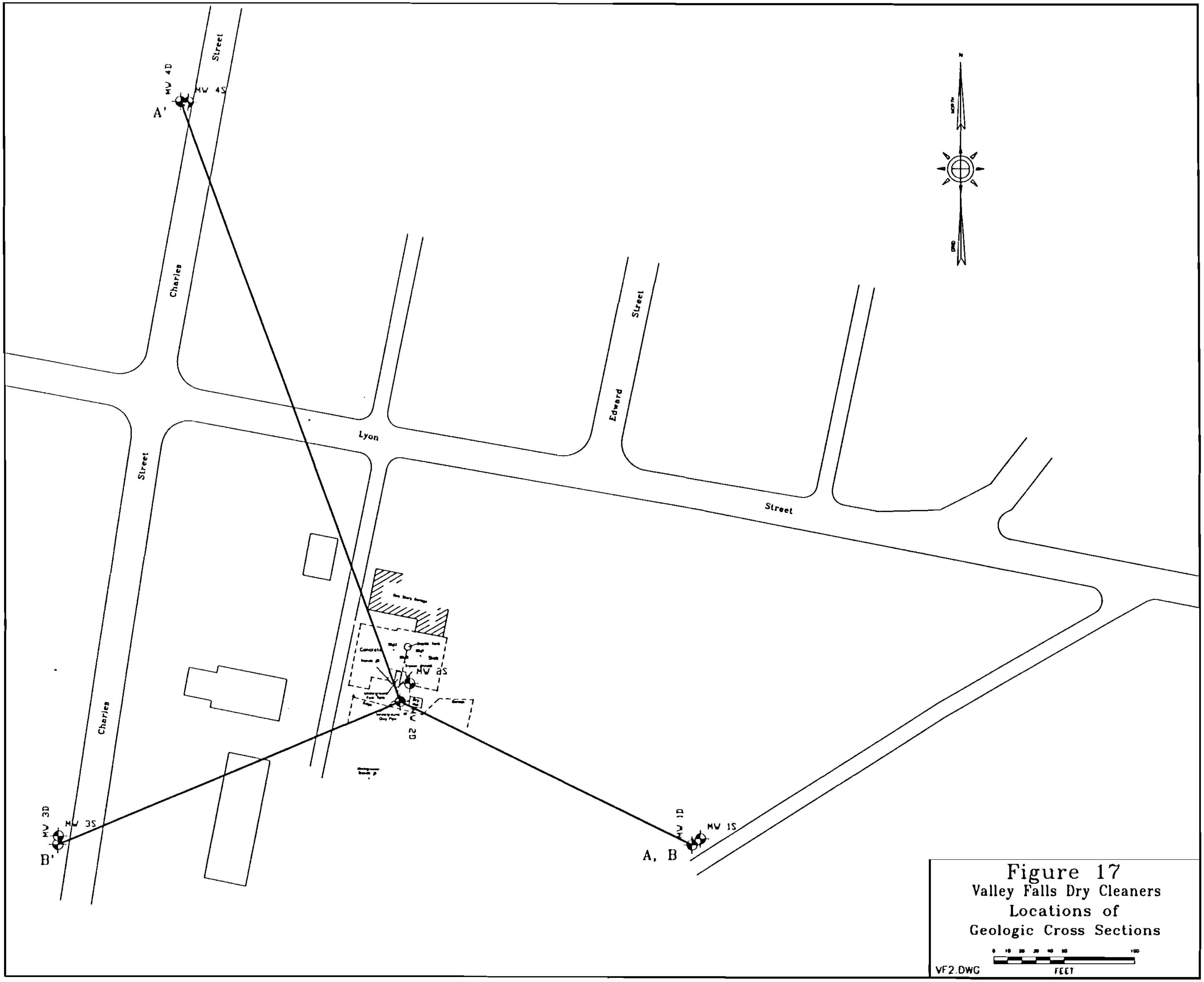


Figure 17
Valley Falls Dry Cleaners
Locations of
Geologic Cross Sections

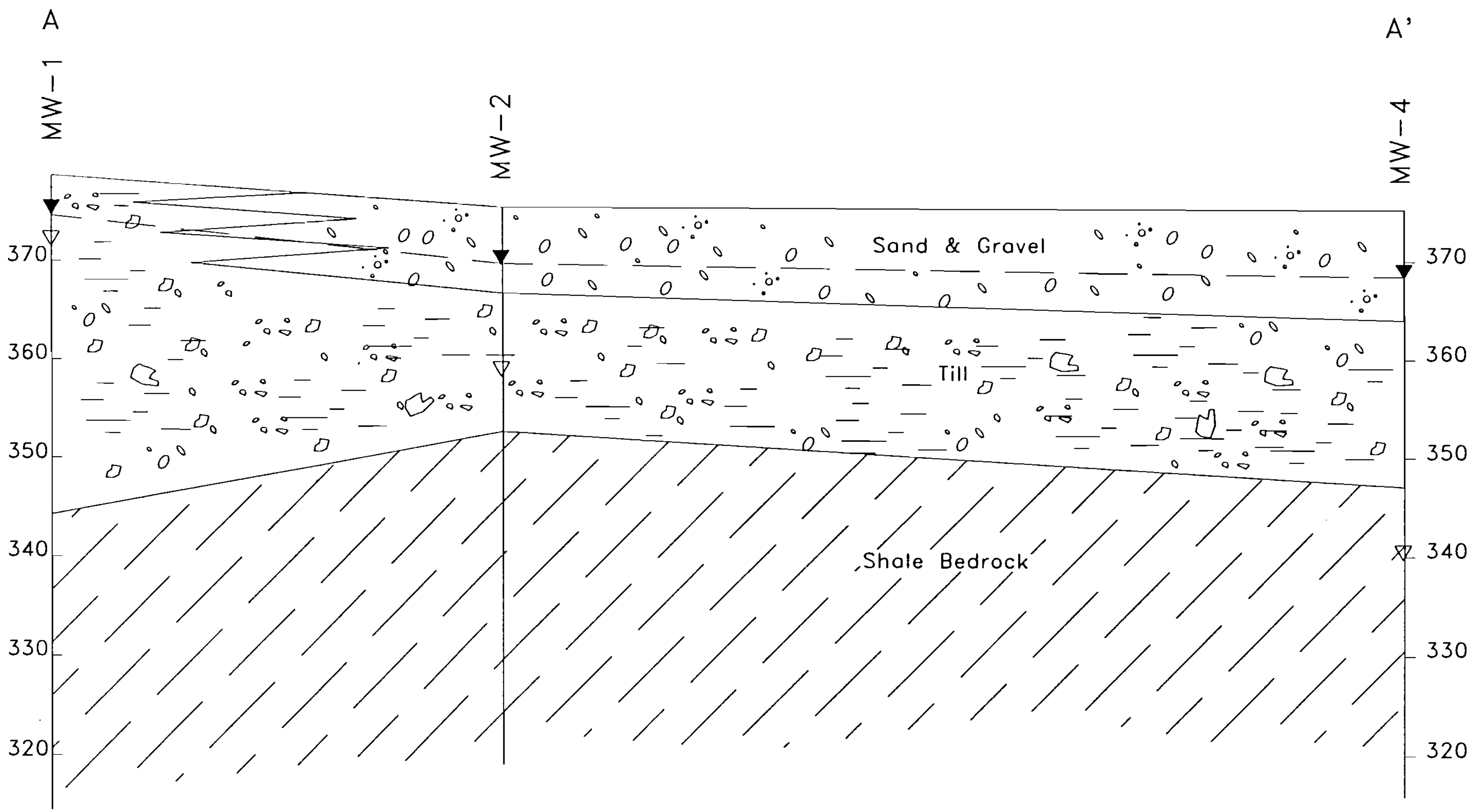


Figure 18 – Geologic Cross Section
Valley Falls Dry Cleaner
Valley Falls, NY. Site ID# 4-42-028

▼ Watertable – Upper Aquifer
▽ Potentiometric Surface – Bedrock Aquifer
0 25 50 65 FEET NOTE: Vertical exageration = 5 X

DAVIDSN2.DWG

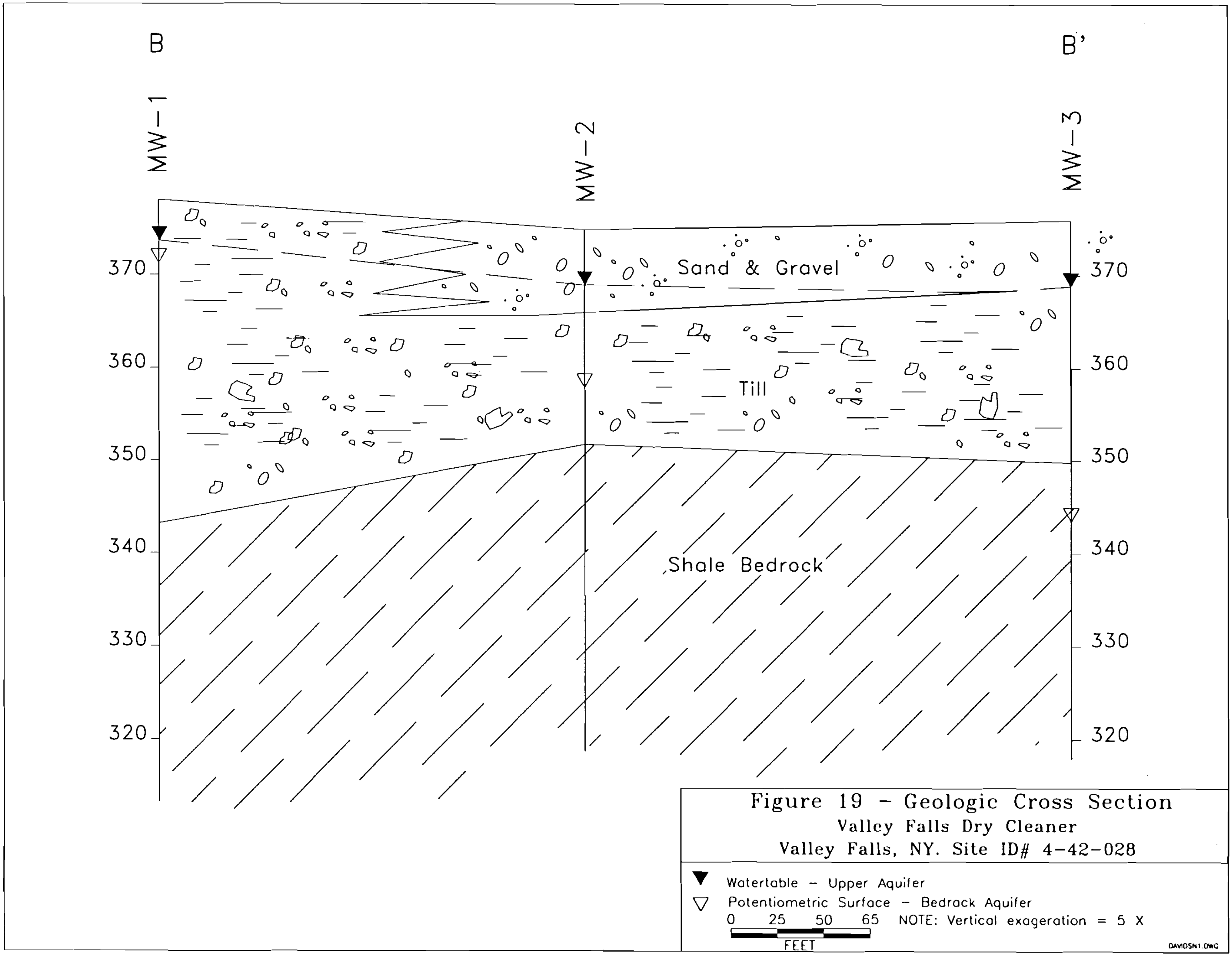


Figure 19 - Geologic Cross Section
Valley Falls Dry Cleaner
Valley Falls, NY. Site ID# 4-42-028

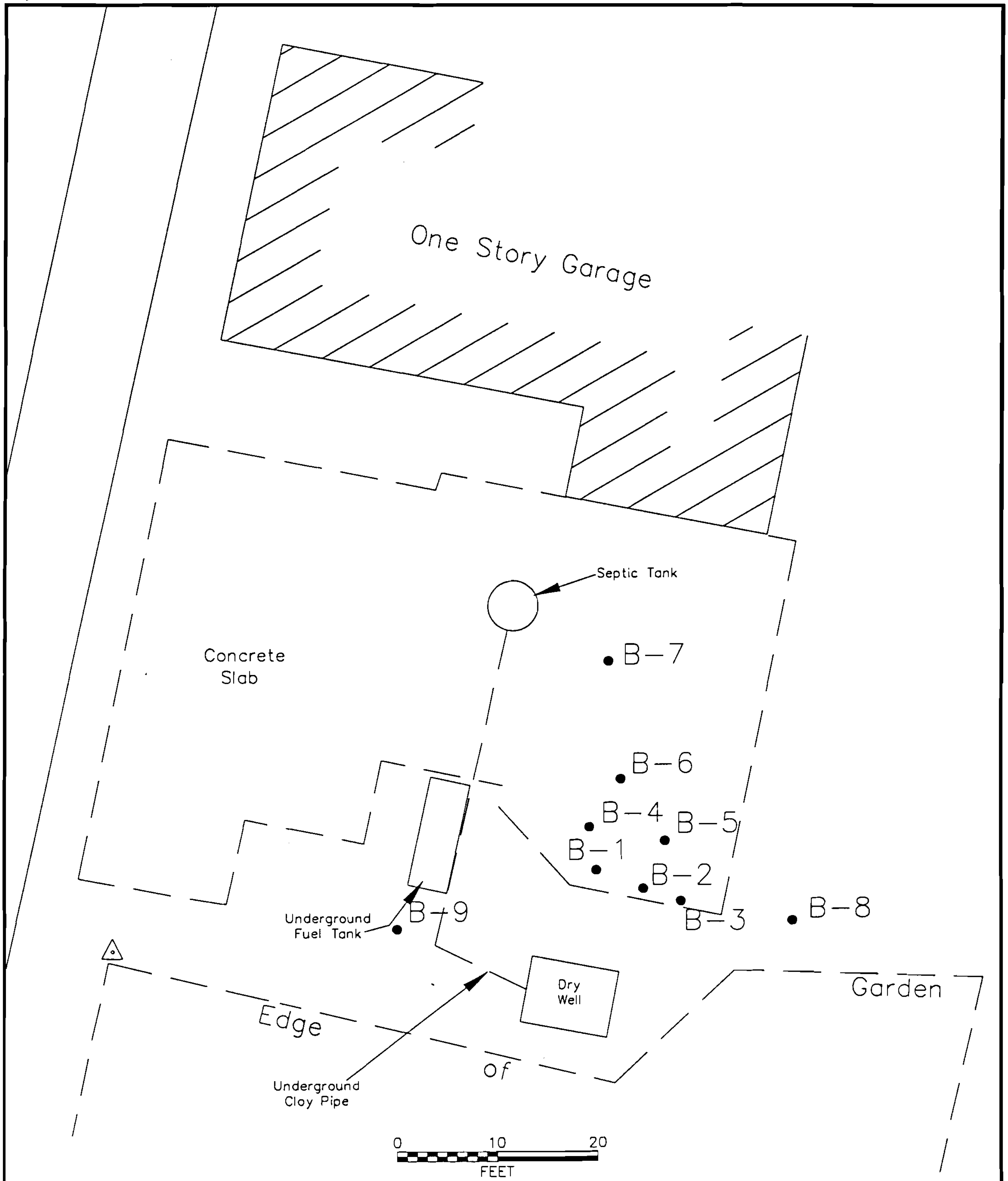
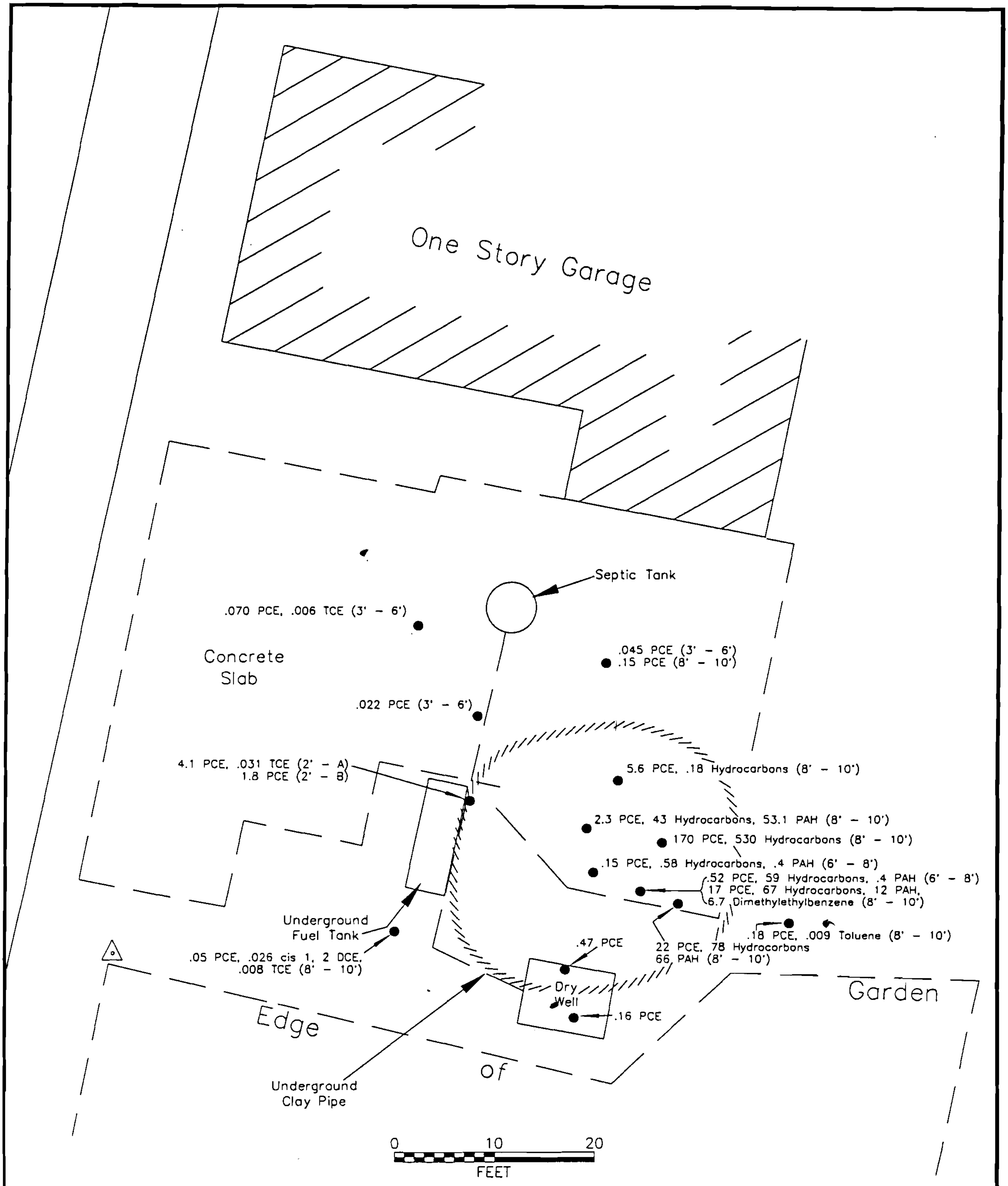


Figure 20
Valley Falls Dry Cleaners
Supplemental Boring Locations

VF2-BORS.DWG



KEY

- ● Soil sample location
- Estimated area of soils above site clean up level of .84 ppm PCE (primarily 7–9', approximately 50 – 100 cu. yards)

All concentrations in Parts Per Million

Figure 21

Valley Falls Dry Cleaners

Summary of On-site Soil Sample Analytical Results

vf-fig21.dwg

TABLES

Table 1

Summarized Results of Groundwater Saple Analysis
Parsons ES
Valley Falls, NY

Sample ID	TCE (ug)	TCE (ppmv)	PCE (ug)	PCE (ppmv)	DCE (ug)	NON-TARGET VOCs (Total Area Count)
BLANK	ND	ND	ND	ND	ND	12.9
SYRINGE	ND	ND	ND	ND	ND	ND
10:1 DIL	1.465	27.25	1.623	23.87	1.443	166
5:1 DIL	2.93	54.50	3.246	47.75	2.996	336
2:1 DIL	7.325	136.25	8.115	119.37	7.215	477
BLANK	ND	ND	ND	ND	ND	19
GP-1	ND	ND	0.21	3.09	ND	ND
GP-2	ND	ND	0.17	2.50	ND	ND
GP-3	ND	ND	0.61	8.97	ND	ND
GP-4	ND	ND	0.47	6.91	ND	ND
GP-5	ND	ND	0.26	3.82	ND	ND
GP-6	ND	ND	0.05	0.74	ND	ND
GP-7	ND	ND	ND	ND	ND	ND
BLANK	ND	ND	ND	ND	ND	ND
GP-8	ND	ND	ND	ND	ND	ND
GP-9	ND	ND	ND	ND	ND	ND
GP-11	ND	ND	ND	ND	ND	ND
STD	0.25	4.65	1.58	23.24	NA	176
BLANK	ND	ND	ND	ND	ND	ND
GP-12	ND	ND	ND	ND	ND	ND
GP-13	ND	ND	ND	ND	ND	ND
GP-14	ND	ND	ND	ND	ND	ND
GP-15	NS	ND	NS	NS	NS	NS
GP-16	ND	ND	0.004	0.06	ND	17.2
GP-17	ND	ND	0.006	0.09	ND	ND
GP-18	ND	ND	0.002	0.03	ND	ND
GP-19	ND	ND	ND	ND	ND	ND
GP-20	0.006	0.11	0.086	1.27	ND	31
GP-21	NS	NS	NS	NS	NS	NS
GP-22	ND	ND	0.004	0.06	ND	ND
GP-23	ND	ND	ND	ND	ND	ND
GP-24	ND	ND	ND	ND	ND	ND
GP-25	ND	ND	ND	ND	ND	ND
GP-26	ND	ND	ND	ND	ND	ND
GP-27	ND	ND	ND	ND	ND	ND
GP-28	ND	ND	ND	ND	ND	ND
BLANK	ND	ND	ND	ND	ND	ND
GP-29	0.004	0.07	0.118	1.74	ND	ND
GP-30	ND	ND	0.032	0.47	ND	ND
GP-31	NS	NS	NS	NS	NS	NS
GP-32	NS	NS	NS	NS	NS	NS
GP-33	0.002	0.04	0.062	0.91	ND	ND
GP-33D	0.004	0.07	0.084	1.24	ND	ND
GP-34	NS	NS	NS	NS	NS	NS
GP-35	ND	ND	0.006	0.09	ND	ND
STD	0.57	10.60	5.66	83.25	ND	ND
BLANK	ND	ND	ND	ND	ND	ND
GP-36	ND	ND	0.006	0.09	ND	ND
GP-45	ND	ND	0.01	0.15	ND	ND
GP-47	ND	ND	0.03	0.44	ND	ND
GP-50	0.02	0.37	0.238	3.50	ND	ND
GP-49	0.026	0.48	0.89	13.09	ND	ND
GP-51	ND	ND	0.008	0.12	ND	ND
GP-46	ND	ND	0.008	0.12	ND	ND
GP-53	ND	ND	0.006	0.09	ND	ND
GP-55	ND	ND	0.008	0.12	ND	ND
GP-48	ND	ND	0.004	0.06	ND	ND
GP-52	ND	ND	0.076	1.12	ND	ND
GP-56	ND	ND	0.002	0.03	ND	ND
GP-54	ND	ND	0.048	0.71	ND	ND
GP-37	ND	ND	0.002	0.03	ND	ND
GP-39	ND	ND	0.004	0.06	ND	ND
GP-40	ND	ND	0.01	0.15	ND	ND
GP-41	ND	ND	0.002	0.03	ND	ND
GP-42	ND	ND	0.004	0.06	ND	ND
GP-43	ND	ND	ND	ND	ND	ND
GP-44	ND	ND	ND	ND	ND	ND

Table 2

Summary of NYSDOH Sampling of Residential Wells
Valley Falls, Rensselaer Co.

#	STREET	PO BOX	WELL	MISC. WELL INFO	FILTER	FILTER INFO	CONCENRATION & DATE				
	Boulevard Ave.		108 feet, Unknown				ND - 12/28/94				
1	Burton St.	PO Box 26					ND - 8/5/92				
2	Burton St.			Water softener upstairs			ND - 8/20/92				
3	Burton St.	PO Box 281					ND - 8/20/92				
4	Burton St.		Unknown				ND - 11/10/94				
5	Burton St.	PO Box 13	116 feet, Drilled				ND - 8/5/92				
6	Burton St.						ND - 11/10/94				
7	Burton St.	PO Box 58					ND - 8/5/92				
8	Burton St.	PO Box 204					ND - 8/20/92				
9	Burton St.		Unknown, Drilled				ND - 8/20/92				
11	Burton St.	PO Box 184	100-120 feet, Unknown	Water softener			ND - 8/20/92				
13	Burton St.	PO Box 146	70-80 feet, Driven				ND - 8/20/92				
3	Charles St.	PO Box 43					ND - 11/1/94				
5	Charles St.	PO Box 52	Unknown				ND - 8/20/92				
7	Charles St.	PO Box 62					ND - 8/5/92				
8	Charles St.	PO Box 124	168 feet				ND - 8/5/92				
9	Charles St.						1MC 0.9Chlor	1MC 0.5[PL] Chlor - 2/8/93	ND - 11/10/93	0.5[PL]Tol;0.5[PL]Chlor - 11/1/94	
10	Charles St.	PO Box 297	150, Drilled		Yes	Disconnected & carbon removed	5.0 - 1/30/92				
10	Charles St.	PO Box 297	140, Drilled				0.5[PL]PCE - 4/9/92	ND - 11/10/93	0.5[PL]PCE - 11/1/94	ND - 12/14/95	
11	Charles St.						0.5[PL]CHLOR - 11/1/94	ND - 12/14/95			
12	Charles St.		15 feet, Dug		Yes		115PCE;3.6Tce;3.7C12DCE*- 12/30/91	190PCE;24 C12DCE:22TCE - 1/21/92			
13	Charles St.		Unknown				ND - 3/16/92	ND - 11/10/93			
14	Charles St.		Unknown,Drilled				1.0 - 1/21/92	ND - 11/10/93	ND - 11/1/94		
15	Charles St.		Unknown, Dug				ND - 3/16/92				
16	Charles St.		45, Drilled	Well disconnected	Yes	Disconnected 6/95 by owner	8.0 - 1/23/92	ND - 1/30/92			
16	Charles St.		240 feet, Drilled	New well drilled in June '95	Yes	Connected 8/95 by owner	0.8Tol.(BF);0.7111TCA(AF) - 6/27/95				
17	Charles St.		15 feet, Dug				ND - 1/21/92	ND - 1/23/92	ND - 11/10/93		
103	Charles St.		163 feet, Driven				ND - 1/30/92	ND - 11/10/93			
3	Edward St.						ND - 3/16/92				
4	Edward St.	P.O. Box 241					ND - 8/20/92	ND - 11/3/94			
5	Edward St.	PO Box 221	107 feet				ND - 3/25/92	ND - 11/30/93			
6	Edward St.	PO Box 105					ND - 10/14/92				
7	Edward St.		Unknown				ND - 3/25/92				
9	Edward St.		100+ feet, Drilled		Yes		130 - 1/30/92				
9	Edward St.		18 feet, Dug	Abandoned			ND - 1/30/92				
10	Edward St.	PO Box 187					1.0 111TCA - 8/5/92	ND - 1/10/93	2.5Chlor - 1/10/96		
12	Edward St.	PO Box 232	145 feet, Drilled				ND - 8/5/92				
14	Edward St.		Unknown, Drilled				ND - 3/16/92				
16	Edward St.		Unknown				ND - 3/25/92				
18	Edward St.		Unknown, Drilled				ND - 1/21/92				
1	Emily St.	PO Box 133	Unknown, Dug				ND - 8/20/92				
8	Emily St.	PO Box 36	159 Feet, Drilled				ND - 8/5/92	ND - 11/10/93			
11	Lyon St.		Unknown, Drilled	Drinking water well	Yes		47.0PCE - 1/23/92				
11	Lyon St.		Unknown, Dug	Not used for drinking			2.0PCE - 1/23/92				
14	Lyon St.	PO Box 122	90 feet, Drilled				ND - 3/16/92	0.5 TOL. - 9/9/95			
14	Lyon St.		143 feet, Drilled	Existing Well Deepened Sept. 95							
15	Lyon St.	PO Box 65					ND - 8/5/92	ND - 11/10/93			
	Lyon St.		~100 feet, Unknown				ND - 12/19/94				
	Myron St.		380 feet,Drilled				ND - 1/21/92	ND - 1/23/92	ND - 11/10/93		
	Old Powdermill Rd	PO Box 282	198 feet, Drilled				ND - 2/23/94	ND - 3/8/94	0.5[PL]PCE - 6/1/94	ND - 11/3/94	ND - 6/10/96
5	Poplar Ave.	PO Box 11	Unknown				ND - 11/10/94				
7	Poplar Ave.		120 feet, Drilled				ND - 11/10/94				
8	Poplar Ave.						ND - 11/1/94				
12	Poplar Ave.		42-45 feet,Drilled				0.5[PL]11TCA - 11/3/94				
20D	Poplar Ave.						ND - 11/10/94				
6	Poplar St.		Unknown,Drilled				ND - 11/10/94				
	RD #1	PO Box 23D	Unknown				ND - 11/10/94				
	RD #1	PO Box 23C	Unknown				ND - 11/10/94				
	RD 2, Box 23E		52 feet, Unknown				1.7 - 6/1/94	2.8 - 11/10/94	2.8PCE - 12/14/95		
	RD 2, Box 24		Unknown, Spring				ND - 6/1/94				
2	State St.	PO Box 2					ND - 11/1/94				
3	State St.	PO Box 173	180 feet, Drilled				ND - 11/1/94				
6	State St.		Unknown				ND - 11/11/94				
7	State St.		111 feet				ND - 11/3/94				
8	State St.		155 feet, Drilled	Unused shallow not sampled			ND - 11/3/94				
10	State St.		50-60 feet, Drilled				0.9 111TCA - 11/3/94	ND - 1/10/96			
11	State St.		100 feet, Drilled				ND - 11/3/94				
11	State St.			?Same well as print shop??			ND - 11/3/94				
12	State St.		98 feet				ND - 11/3/94				
13	State St.		Unknown				ND - 11/3/94				
14	State St.		Unknown				0.7Chlor - 11/10/94				
15	State St.	PO Box 143	149 feet, Drilled				0.5[PL]111DCA- 11/1/94	ND - 12/14/95			
16	State St.						ND - 11/1/94				
18	State St.	PO Box 135					ND - 3/8/94				
19	State St.		163 feet, drilled				ND - 11/3/94				
20	State St.	PO Box 211					ND - 3/8/94				
21	State St.		Unknown, Drilled				ND - 2/23/94				
22	State St.	PO Box 171					ND - 10/14/92	ND - 3/ 8/94			
23	State St.	25 State St.	Unknown, Drilled				ND - 3/8/94	0.5[PL]TCE - 6/1/94	ND - 1/10/96		
24	State St.	PO Box 121					ND - 3/8/94				
25	State St.	PO Box 193					ND - 3/8/94				
26	State St.	PO Box 95	Unknown, Drilled	Drinking water supply			ND - 1/21/93	ND -3/8/94			
26	State St.		Unknown	Shallow well used for garden							
27	State St.	PO Box 52					ND - 2/23/94	ND - 6/1/94			

Table 2 (con't.)

Summary of NYSDOH Sampling of Residential Wells
Valley Falls, Rensselaer Co.

#	STREET	PO BOX	WELL	MISC. WELL INFO	FILTER	FILTER INFO	CONCENRATION & DATE				
27	State St		Unknown				ND - 12/14/95				
28	State St.						1.0 - 1/21/93	1.0 - 2/8/93	1.3 - 11/30/93	2.1- 11/1/94	0.5PCE - 12/14/95
29	State St.	PO Box 4					ND - 3/8/94				
32	State St.	P.O. Box	Unknown				ND - 10/14/92				
32	State St	PO Box 183					ND - 10/14/92				
33	State St.	P.O. Box 128	Drilled, 130 feet	Apt. C (Matheson) on same well			ND - 8/20/92	2.0 PCE - 3/8/94	1.2 PCE - 6/1/94	1.5 PCE - 11/1/94	1.1 PCE - 1/10/96
34	State St.	PO Box 37	90 feet, Drilled	Water softener for hot H2O			ND - 1/21/93				
35	State St.	PO Box 163					ND - 2/23/94				
36	State St.	PO Box 192	Unknown, Dug		Yes	Installed December '94	8.7 - 11/1/94				
37	State St.	PO Box 85	200 feet, Drilled				ND - 2/23/94	ND - 11/1/94			
37	State St.	PO Box 42	98 feet				ND - 6/1/94	ND - 11/3/94			
38	State St	PO Box 238	98 feet				ND - 10/14/92				
39	State St.	PO Box 291					ND - 3/8/94				
40	State St.		Unknown				ND - 3/16/92				
41	State St.	PO Box 231	85 feet, Drilled				ND - 2/23/94				
43	State St.	PO Box 108	100 feet, Drilled				4.3 - 3/8/94	2.8 - 6/1/94	3.5 - 11/3/94	X - 1/96	
44	State St	PO Box 224					ND - 10/14/92				
45	State St.	PO Box 208	65-85 feet, Drilled				ND - 3/8/94	0.5[PL]PCE - 6/1/94	ND - 6/1/94	ND - 1/10/96	
46	State St	PO Box 84					ND - 10/14/92				
47	State St.	PO Box 392	200 feet, Drilled				ND - 2/23/94				
48	State St.	PO Box 148		Sed filter,garage apt shares well			1.0 - 1/21/93	0.8 - 2/8/93	0.5 - 11/10/94	0.9 - 11/1/94	0.7 PCE - 12/14/95
49	State St.	PO Box 58	54-58 feet, Drilled				3.2 - 2/23/94	4.0 - 6/1/94	3.6 - 11/1/94	2.4PCE 12/14/95	
50	State St	PO Box 251		1 well serves 3 apartments			0.5 - 2/23/94	0.5 - 11/3/94	0.5PCE - 12/14/95		
51	State St		Unknown, Point				0.9 - 2/23/94	4.8PCE;0.5[PL]TCE - 1/21/92	1.0PCE - 1/10/96		
53	State St	PO Box 59	118 feet, Drilled				1.8 - 2/23/94	1.8 - 6/1/94	2.3 - 11/1/94		
31	State St., Apt. A		90-100 feet, Drilled	3 apartments share well			1.7 - 6/1/94	1.4 - 11/3/94	4.2 PCE 1/10/96		
33	State St., Apt. B	PO Box 103	Unknown				1.4 - 2/23/94	1.0 - 3/8/94	2.8 - 6/1/94	0.9 - PCE - 12/14/95	
	Our Lady of Good	Council					0.8MC - 1/21/93	2.9MC - 2/8/93	ND - 11/10/94	ND - 11/1/94	ND - 12/14/95

NOTES:
All units reported in micrograms per liter (mcg/l)
Blank space = not sampled
ND = Not Detected
[PL] = present but less than the detection limit
X = Sampled; Results pending
(D) = Disconnected
(W) = Work Phone
11DCA = 1,1-Dichloroethane
TCE = Trichloroethene
111TCA = 1,1,1- Trichloroethane
C12DCE = Cis-1,2-Dichloroethene
PCE= Perchloroethylene (Tetrachloroethene)
MC = Methylene Chloride
Chlor = Chloroform
Tol = Toluene
* = Sample collected by Bender Lab

TABLE 3

Valley Falls Dry Cleaner Site # 442028

Monitoring Well Information

Depth to water from measuring point in ft.

	Date	Date	Date	Date
Well Number	4/19/96	4/22/96	6/6/96	8/8/96
MW - 1s	5.03	5.40	6.45	7.31
MW - 1D	7.81	7.66	9.365	10.50
MW - 2s	6.356	5.56	8.39	9.88
MW - 2D	16.17	15.46	18.61	21.80
MW - 3s	4.35	5.56	6.50	6.91
MW - 3D	30.17	29.66	31.98	37.23
MW - 4s	5.458	5.40	6.065	6.83
MW - 4D	32.65	32.4	34.68	39.23

Measuring point to grade level in ft.

Well Number	Well Stick-up/ ft. to grade
MW - 1s	2.03 stick-up
MW - 1D	2.31 stick-up
MW - 2s	2.49 stick-up
MW - 2D	1.91 stick-up
MW - 3s	+.37 to grade
MW - 3D	+.35 to grade
MW - 4s	+.51 to grade
MW - 4D	+.54 to grade

TABLE 4

Valley Falls Dry Cleaner Site # 442028

Monitoring Well Information

Elevation of the Watertable/Potentiometric Surface in ft.

	Date	Date	Date	Date
Well Number	4/19/96	4/22/96	6/6/96	8/8/96
MW - 1s	375.62	375.25	374.20	373.34
MW - 1D	373.06	373.21	371.51	370.37
MW - 2s	371.86	372.66	369.83	368.34
MW - 2D	361.02	361.73	358.58	355.39
MW - 3s	371.36	370.15	369.21	368.80
MW - 3D	345.59	346.10	343.78	338.53
MW - 4s	369.22	369.28	368.62	367.85
MW - 4D	341.90	342.15	339.87	335.32

TABLE 5

MONITORING WELL SLUG TEST RESULTS

ESTIMATES OF AQUIFER HYDRAULIC CONDUCTIVITY

WELL #	cm/sec	ft/day
1s	1.1×10^{-3}	3.1
1D	1.6×10^{-5}	4.66×10^{-2}
2s	2.4×10^{-3}	6.7
2D	2.5×10^{-5}	0.1
3s	1.4×10^{-3}	3.9
4s	1.5×10^{-4}	0.4
4D	4.3×10^{-6}	1.21×10^{-2}

NOTE: Well # 3D exhibted very slow recovery. Meaningful results could not be obtained.

TABLE 6

MONITORING WELL ANALYTICAL RESULTS

Summary of PCE and Breakdown Products

April 22, 1996

WELL #	Tetrachloroethene (PCE)	Breakdown Products
1s	ND	ND
1D	ND	ND
2s	180	40
2D	ND	ND
3s	12	ND
3D	12	ND
4s	90	11
4D	ND	ND

Notes:

Concentrations in parts per billion (ppb)
ND = Not Detected, less than 1ppb
Breakdown Products include trichoroethene & cis-1,2 dichloroethene

TABLE 7

MONITORING WELL ANALYTICAL RESULTS

Summary of PCE and Breakdown Products

August 8, 1996

WELL #	Tetrachloroethene (PCE)	Breakdown Products
1s	ND	ND
1D	ND	ND
2s	230	78
2D	ND	ND
3s	NOT ENOUGH WATER TO SAMPLE	
3D	ND	ND
4s	97	6(J)
4D	2(J)	ND

Notes:

Concentrations in parts per billion (ppb)
ND = Not Detected, less than 1ppb
(J)- Estimated Value
Breakdown Products include trichoroethene & cis-1,2 dichloroethene

TABLE 8

SUMMARY OF TEST PIT & SOIL SAMPLE ANALYTICAL RESULTS

Sample #	Matrix	Location/Description	Concentration
BH-1	sediment	dry well sediment from backhoe bucket	230PCE
BH-2	sediment	dry well sediment from backhoe bucket	330PCE
sg-1	soil	foundation ss-1 (8-10ft.)	45PCE
sg-2	soil	foundation ss-2 (8-10ft.)	22PCE
sg-3	soil	foundation ss-3 (8-10ft.)	70PCE; 6TCE
ss-1	soil	MW-2s (6-8ft.)	43PCE
ss-2	soil	MW-2s(8-10ft.)	650PCE; 45TCE
ss-3	soil	MW-3 cuttings	13 Acetone
ss-4	soil	MW-4 cuttings	17(J) VOCs
TP-4A	soil	soil under septic pipe behind foundation	1800PCE
TP-4B	soil	soil under septic pipe behind foundation (grey sludge in sample)	4100PCE; 31TCE
DW-1	sediment	bottom of dry well	90PCE
DW-2	sediment	bottom of dry well	160PCE
DW-1(soil)	soil	side of dry well	470PCE
TP-3	soil	soil next to fuel tank	ND
TP-3	water	groundwater in test pit next to fuel tank	35PCE
Fuel Tank	water	liquid in tank	920 Total VOCs; numerous straight-chain hydrocarbon non-target compounds

Notes:
All concentrations in parts per billion (ppb)
(J) - estimated value ; ND - not detected
VOCs - volatile organic compounds

TABLE 9

SUMMARY OF SUPPLEMENTAL SOIL BORING ANALYTICAL RESULTS

Sample # & Depth Interval	Concentration in soil in ppb
VFB #1 6'-8'	150PCE; 580hydrocarbons; 400PAHs
VFB #2 6'-8'	520PCE; 59,000(j)hydrocarbons; 60,000(j)PAHs
VFB #2 8'-10'	17,000PCE; 67,000(j)hydrocarbons; 12,000(j)PAHs; 6,700 dimethylethylbenzene(j)
VFB #3 8'-10'	22,000PCE; 78,000(j)hydrocarbons; 66,000(j)PAHs;
VFB #4 8'-10'	2,300PCE; 43,000(j)hydrocarbons; 53,100(j)PAHs;
VFB #5 8'-10'	170,000PCE; 530,000(j)hydrocarbons
VFB #6 8'-10'	5,600(j)PCE; 180(j)hydrocarbons
VFB #7 8'-10'	150PCE
VFB #8 8'-10'	180PCE; 9(j)toluene
VFB #9 8'-10'	50PCE; 26cis-1,2DCE; 8(j)TCE

Notes:

ppb - parts per billion
(J) - estimated value
PCE - tetrachloroethene
hydrocarbons - straight-chain hydrocarbon non-target compounds
PAHs - polycyclic aromatic hydrocarbons (semi-volatiles)
TCE - trichorethene
cis-1,2DCE - cis-1,2dichloroethene