Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Valley Falls Dry Cleaner Site
Valley Falls (V), Rensselaer County
Site Number 4-42-028

February 1998

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* JOHN P. CAHILL, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Valley Falls Dry Cleaner Inactive Hazardous Waste Site
Village of Valley Falls, Rensselaer County, New York
Site No. 4-42-028

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the Valley Falls Dry Cleaner inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law (ECL). The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Valley Falls Dry Cleaner Inactive Hazardous Waste Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography of the documents composing the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened release of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential threat to public health and the environment.

Description of Selected Remedy

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) for the Valley Falls Dry Cleaner and the criteria identified for evaluation of alternatives the NYSDEC has selected on-site soil/(source) cleanup and contaminated well replacement or treatment.

The components of the remedy are as follows:

Contaminated Private Wells:

Replace individual contaminated drinking water wells with bedrock wells or provide GAC/UV systems on the affected wells. (Individuals will be given an option between well replacement or GAC maintenance)

Source Removal:

Remediate on-site soil (source) using excavation and off-site disposal of approximately 75 cubic yards of contaminated soil.

Decommission abandoned fuel tank, septic tank, associated pipes and dry well.

Groundwater Remediation:

Groundwater will be recovered from the excavation pit and treated prior to disposal.

The monitoring wells and the affected private water supply wells will be monitored semi-annually for a period of five years. At the end of the 5 year monitoring period, the site will be evaluated to determine the effectiveness of the remedial actions.

The selected remedy will also include a remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Any uncertainties identified during the RI/FS will be resolved.

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedy selected for this site as being protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

2/20/98
Date

Michael J. O'Toole, Jr., Director
Division of Environmental Remediation

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SECTION 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 miles 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 Figures 1a and b for site location maps.

The site, the former Winchell Dry Cleaners property, consists of a relatively flat parcel of land, and includes the residence of the present owner at 11 Lyons Street. The property actually includes four contiguous parcels totaling approximately 1.2 acres.

SECTION 2: SITE HISTORY

2.1: Operational/Disposal 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 (PCE) wastes directly onto the ground surface when operators washed lint filters in wash water which discharged into an on-site septic system.

2.2: Remedial History

In January 1992, the NYSDOH sampled nine private wells after it was notified of contamination of a private well in the Village of Valley Falls. The results of the sampling analysis from one of the wells revealed that the concentration of PCE contamination exceeded the USEPA action level of 67 ppb. As a result, the site was referred by the NYSDEC to the USEPA for an emergency response action. USEPA provided bottled water and installed Granular Activated Carbon/Ultraviolet (GAC/UV) units at six residences that exceeded the NYSDOH drinking water standard of 5 ppb. The NYSDEC completed a Phase I assessment of the site in June 1993 and the site was listed on the NYS Registry as a class 2 Inactive Hazardous Waste Disposal Site. NYSDEC initiated an in-house Remedial Investigation in early 1996. This work was completed in December 1996.

SECTION 3: CURRENT STATUS

In response to a determination that the presence of hazardous waste at the Site presents a significant threat to human health and/or the environment, the NYSDEC has recently completed a Remedial Investigation/Feasibility Study (RI/FS).

3.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site.

The RI was conducted in a single phase in 1996. A report entitled Remedial Investigation Report, Valley Falls Dry Cleaner and dated December 1996 has been prepared describing the field activities and findings of the RI in detail. The RI included the following activities:

- Background information research
- Soil gas survey
- Shallow test pits
- Soil borings with continuous split spoon sampling
- Installation of 8 monitoring wells
- Groundwater monitoring, groundwater and soil sampling and analysis
- Exposure pathways evaluation
- Site mapping and surveying
- Report preparation
- Public participation

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the RI analytical data was compared to environmental Standards, Criteria, and Guidance (SCGs). Groundwater, drinking water and surface water SCGs identified for the Valley Falls Dry Cleaner site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. NYSDEC TAGM 4046 soil cleanup guidelines for the protection of groundwater, background conditions, and risk-based remediation criteria were used as SCGs for soil.

The site investigation also revealed the presence of an abandoned on-site fuel tank, dry well, septic tank and associated pipes. These would require proper closure during the remedial phase.

Based upon the results of the remedial investigation in comparison to the SCGs and potential public health and environmental exposure routes, certain areas and media of the site require remediation. These are summarized below. More complete information can be found in the RI Report.

Chemical concentrations are reported in parts per billion (ppb) and parts per million (ppm). For comparison purposes, SCGs are given for each medium.

3.1.1 Nature of Contamination:

As described in the RI Report, soil and groundwater samples were collected at the Site to characterize the nature and extent of contamination. The Remedial Investigation revealed that the site is contaminated by perchloroethylene (PCE) and its breakdown products of trichloroethylene (TCE) and dichloroethylene (DCE).

3.1.2 Extent of Contamination

Table 1 summarizes the extent of contamination for the contaminants of concern in soils and groundwater and compares the data with the proposed remedial action levels (SCGs) for the site. The following are the media which were investigated and a summary of the findings of the investigation.

Soil

The soil sample analysis conducted at the Valley Falls Dry Cleaner Site indicated that the on-site soil is contaminated with PCE and its breakdown products of TCE and DCE. The concentration of the contaminants of concern ranges from 0.012 to 170 ppm. Sample locations and the analytical results are shown in Figure 3a. The soil cleanup level necessary to achieve protection of the groundwater is 0.84 ppm (840 ppb) (see Table 1).

Groundwater

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. 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, impeding the movement of groundwater. Bedrock was encountered at a depth of 23 feet at the site.

Both aquifers exhibit low yield. The shallow sand and gravel aquifer is an unconfined water table aquifer which yielded only about 1 gpm or less to monitoring wells when pumped. In the past, however, most homes in the village depended on this aquifer for a water supply. Water was obtained from large diameter dug wells. Two residents in the vicinity of the site still obtain their drinking water from shallow large diameter dug wells. The sand and gravel is about 9 feet deep at the site, the bottom 2 to 4 feet are saturated, depending on the season. The on-site shallow groundwater is contaminated by PCE and its breakdown products of TCE and DCE in concentrations up to 350 ppb. The aerial extent of the shallow groundwater plume above 200 ppb is approximately 3 acres. Concentrations in the off-site shallow groundwater are in excess of 100 ppb for PCE and its breakdown products, extending from the site to the northwest (Figure 2).

Most shallow dug wells have been replaced by drilled bedrock wells over the years. The shale bedrock aquifer yielded only about 1 ½ gpm or less to monitoring wells which were drilled 30 feet into the rock. Most deeper residential bedrock wells have higher yields, perhaps to about 5 gpm or 6 gpm. The bedrock aquifer is also contaminated by low levels of PCE and its breakdown products. The highest confirmed levels of PCE in the bedrock have been detected in the on-site homeowner's 120 foot deep bedrock well. A total of six homeowner's wells were impacted with PCE contamination above the NYSDOH SCGs value of 5 ppb. Four of the wells are bedrock wells with PCE concentration ranging from 5 to 130 ppb. The other two impacted wells are installed in the shallow sand and gravel aquifer with PCE concentration ranging from 8 to 190 ppb. There has been no apparent decline in concentration of contaminants in these wells over time. Contaminant concentrations in other residential bedrock wells generally occur at very low levels (1 to 2 ppb), but the contamination appears to be quite widespread, with very low levels showing up ½ mile downgradient of the site. The mechanism for transport of the contaminants from the upper sand and gravel aquifer to the bedrock below is somewhat uncertain. The most likely mechanism for transport of the contaminants is leakage along the casing of the on-site homeowner well. Once contaminants are in the fractures and fissures in the bedrock, they can move along fractures with groundwater which may be influenced by the pumping of other bedrock wells in the area. The groundwater cleanup level that will bring the site in compliance with SCGs for PCE, TCE and DCE is 5 ppb respectively.

3.2 Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the health risks can be found in Appendix G of the RI Report.

An exposure pathway is how an individual may come into contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

- Ingestion - The Valley Falls Site is located within an incorporated village, and nearby homes and businesses use groundwater as a drinking water supply. Sampling and analyses of area private wells by the New York State Department of Health has shown the presence of perchloroethylene in twenty two of those wells with six of those wells exceeding the SCGs value of 5 ppb. Two of the six wells exceeding the SCGs value are completed in the upper sand and gravel, and four are bedrock wells. People whose wells are contaminated with perchloroethylene greater than 5 ppb can be exposed to contaminants via ingestion (drinking), dermal absorption (skin contact) and inhalation (breathing during showering and other household uses).

- Inhalation - Soil vapor under the foundation of the former dry cleaner building and south of the building is contaminated with perchloroethylene and its related breakdown products of TCE and DCE. These compounds can volatilize from groundwater or a contaminant source into the pore spaces between soil particles in overburden soils. These volatile chemicals can migrate in vapor form through the soil horizon. Based on the data collected during the RI, contaminants in soil vapor are believed to be limited to the area around the former dry cleaners building. Workers who perform excavations at the site may be exposed to low levels of contaminants due to volatile organic compounds present at the subsurface soil.

3.3 <u>Summary of Environmental Exposure Pathways:</u>

The Hoosic River which is approximately 0.5 miles from the Valley Falls Dry Cleaner site is not suspected to be impacted by the contaminants at the site. There are no surface discharges of contaminants and the groundwater contamination gradient diminishes rapidly with distance from the site. Therefore, there are no environmental exposures as a result of contamination at the Valley Falls site.

SECTION 4: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The Potential Responsible Parties (PRP) for the site, documented to date, include Mr. Winchell, the former site owner (now deceased); and Mr. Johnson who purchased the facility from Mr. Winchell in early 1970. Mr. Johnson is believed to be deceased as well.

There is no financially viable PRP identified for the Valley Falls Dry Cleaner site to date.

SECTION 5: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. The overall remedial goal is to restore the site to pre-disposal conditions, to the extent feasible and authorized by law.

At a minimum, the remedy selected should eliminate or mitigate all significant threats to the public health and to the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The goals selected for this site are:

- To clean up the contaminant level of on-site sources and soils to a level that will be protective (less than 0.84 ppm perchloroethylene) and prevent further contamination of groundwater and to clean up incidental petroleum products associated with an on-site abandoned oil tank.

- To mitigate potential human exposure to contaminated drinking water by providing a drinking water supply within the NYSDOH guidelines (5 ppb, perchloroethylene).

SECTION 6: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy should be protective of human health and the environment, be cost effective, comply with other statutory laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Valley Falls Dry Cleaner site were identified, screened and evaluated in a Feasibility Study. This evaluation is presented in the report entitled Feasibility Study Report dated September 1997.

A summary of the detailed analysis follows. As used in the following text, the time to implement reflects only the time required to implement the remedy, and does not include the time required to design the remedy, to procure contracts for design and construction or to negotiate with responsible parties for implementation of the remedy.

6.1: Description of Alternatives

The potential remedies are intended to address the contaminated soils and groundwater at the site. All remedies contain the requirement to monitor groundwater and private water supply wells semi-annually for a period of 5 years.

The cost to implement all alternatives has been estimated as follows based on a nominal interest of 5% after inflation and a projected life cycle of 5 years (the monitoring and site reassessment period).

Alternative 1: No Further Action

This alternative recognizes the initial remedial actions undertaken at the site as discussed in Section 3.2, Remedial History.

This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

This alternative would include:

- Long term groundwater monitoring

- Long term monitoring of private drinking water wells at risk

- Maintenance and monitoring of GAC/UV well head treatment units as necessary for private drinking water wells exceeding Maximum Cleanup Levels (MCLs)

- Decommissioning of the abandoned fuel tank, septic tank, associated pipes and dry well

The cost to implement Alternative 1 has been estimated as follows:

Present Worth:	$ 50,400
Capital Cost:	$ 400
Annual O&M Cost:	$ 10,920
Time to Implement:	0-6 months

Alternative 2: Contaminated Well Replacement or Treatment

The components of Alternative 2 are as follows:

- Option to replace contaminated private wells exceeding MCLs with deeper, individual wells (or continuing maintenance of individual GAC/UV well head treatment on the present well as necessary). This cost estimate assumes two GAC/UV units and four new private wells.

- Decommission abandoned fuel tank, septic tank, associated pipes and dry well

The cost to implement Alternative 2 has been estimated as follows:

Present Worth:	$48,900
Capital Cost:	$26,400
Annual O&M Cost:	$ 4,920
Time to Implement:	3-9 months

The present worth cost of Alternative 2 is less than Alternative 1 because no O & M costs are associated with new wells that would be installed under this alternative.

Alternative 3: Public Water Supply

The components of Alternative 3 are as follows:

- Development of new community water supply well or extension of water supply from neighboring community

- Decommissioning of two contaminated private wells

- Decommission abandoned fuel tank, septic tank, associated pipes and dry well

The nearest public water supply that might be considered for an extension to this area is in the Town of Schaghticoke about 1.5 miles away.

The cost to implement Alternative 3 has been estimated as follows:

Present Worth:	$1,948,400
Capital Cost:	$1,933,400
Annual O&M Cost:	$ 3,500
Time to Implement:	1-2 years

Alternative 4: On-site Soil/(Source) Cleanup and Contaminated Well Replacement or Treatment

The components of Alternative 4 are as follows:

- GAC maintenance of contaminated private wells or replacement with bedrock individual wells. (Individuals would be given an option between well replacement or GAC maintenance)
- Decommission abandoned fuel tank, septic tank, associated pipes and dry well
- On-site source/soil cleanup using excavation and off-site disposal
- Groundwater recovery (from excavation pit) and treatment.

The cost to implement Alternative 4 has been estimated as follows:

Present Worth:	$82,500
Capital Cost:	$60,000
Annual O&M Cost:	$ 4,920
Time to Implement:	6-9 months

Alternative 5A: On-Site Soil/(Source) Cleanup and Shallow Aquifer Remediation (Reactive Iron Wall)

The components of Alternative 5A are as follows:

- GAC maintenance of individual contaminated wells or replacement with bedrock wells. (Individuals would be given an option between well replacement or GAC maintenance)
- Decommission abandoned fuel tank, septic tank, associated pipes and dry well
- Decommissioning of the two most contaminated private bedrock wells
- On-site source/soil cleanup using excavation and off-site disposal
- Shallow plume containment and treatment using in-situ reactive wall technology

The cost to implement Alternative 5A has been estimated as follows:

Present Worth:	$276,000
Capital Cost:	$242,000
Annual O&M Cost:	$ 7,400
Time to Implement:	9-12 months

Alternative 5B: On-Site Soil/(Source) and Shallow Aquifer Remediation (Pump and Treat)

The components of alternative 5B are as follows:

- GAC maintenance of individual contaminated wells or replacement with bedrock wells. (Individuals would be given an option between well replacement or GAC maintenance)

- Decommission abandoned fuel tank, septic tank, associated pipes and dry well

- Decommissioning of the two most contaminated private bedrock wells

- On-site source/soil cleanup using excavation and off-site disposal

- Shallow plume containment and treatment using extraction/treatment/discharge

The cost to implement Alternative 5B has been estimated as follows:

Present Worth:	$280,000
Capital Cost:	$209,000
Annual O&M Cost:	$ 15,500
Time to Implement:	9-12 months

6.2 Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6NYCRR Part 375). For each of the criteria, a brief description is provided followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is contained in the Feasibility Study.

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

2. Protection of Human Health and the Environment. This criterion is an overall evaluation of the health and environmental impacts to assess whether each alternative is protective.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the controls intended to limit the risk, and 3) the reliability of these controls.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc..

7. Cost. Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final decision. The costs for each alternative are presented in Table 2.

This final criterion is considered a modifying criterion and is taken into account after evaluating those above. It is focused upon after public comments on the Proposed Remedial Action Plan have been received.

8. **Community Acceptance** - Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan have been evaluated. The " Responsiveness Summary" included as Appendix A presents public comments received and the Department's response to the concerns raised.

The six detailed alternatives that were evaluated vary in the degree to which they satisfy the above criteria. The following sections provide a comparison of the alternatives for each of the eight criteria:

Compliance with SCGs

Alternatives 1, 2, and 3 would not bring the site into compliance with SCGs for soil and groundwater. Alternative 4 would comply with SCGs for soil contamination. Alternative 4 would, over time, also comply with SCGs for groundwater since contaminated groundwater from the source would be recovered and treated. The grossly contaminated water recovered from the excavation pit would help accelerate the process of natural attenuation thereby bringing the groundwater into compliance with SCGs sooner.

Alternative's 5A and 5B would comply with SCGs for soil. These alternatives would also provide for active remediation of the shallow groundwater aquifer, however, the effectiveness of the iron wall or the proposed pump and treat system is unknown. This active groundwater remediation would, however, accelerate the process of natural attenuation thereby bringing the groundwater into compliance with SCGs sooner than Alternatives 1,2 or 3.

Recovery of the off-site groundwater contamination below about 100 ppb in the upper sand and gravel aquifer is not feasible or cost effective due primarily to the low levels of contamination present, a low saturated thickness, low transmissivity, and the aerial extent of the contamination in the unit.

Replacement of the contaminated water supply wells in homes that still use the upper sand and gravel aquifer for potable water could eliminate any human exposure to contaminants in the upper sand and gravel aquifer. The replacement water supply wells would be deep, bedrock wells with double casings. With the natural processes of volatilization, sorption and desorption, leaching, diffusion, transformation, degradation, and mixing at work, residual PCE concentrations in the upper sand and gravel aquifer off-site will likely be reduced to levels below the NYSDOH maximum contaminant level(MCL) over time.

Collection of all contaminated groundwater above the NYSDOH MCL in the bedrock aquifer is also technically impracticable. As discussed in the Remedial Investigation Report, 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 would be high, while the hydraulic conductivity in the solid massive rock is essentially zero, but the average bedrock aquifer hydraulic conductivities are very low.

Pumping the bedrock aquifer to reduce contamination to below the NYSDOH MCL is technically impracticable because of the widespread area of low levels of PCE in bedrock fractures and the difficulty in intersecting bedrock fractures with pumping wells. Extremely large volumes of groundwater would have to be removed from the bedrock aquifer to achieve a slight reduction in contaminant levels. Drilling bedrock pumping wells to remove low levels of PCE would be expensive and ineffective in removing contaminants; and could also exacerbate the contamination problem by drawing contamination deeper or into areas where it may not currently exist.

A remedial program that includes monitoring of residential wells and well head treatment for any well above the NYSDOH MCL not replaced would ensure that humans are not exposed to contaminants at the site.

Overall Protection of Human Health and the Environment

Alternatives 1 and 2 would provide some degree of protection to human health due to the continuous maintenance of the GAC system in the affected homes. Alternative 3 would provide the highest level of protection to human health. Alternatives 4, 5A and 5B would provide adequate protection of human health and the environment by removing the exposure through excavation of the surface soil. They would also mitigate exposure pathways due to groundwater by actively remediating the on-site groundwater plume.

Short-Term Impacts and Effectiveness

Alternatives 1 & 2 would provide the least short term effectiveness. These alternatives would not adequately address remedial goals. Alternative 3 would have short term impact due to heavy machinery that would be involved with the installation of the water supply system. Some airborne soil particulate emissions could be anticipated during soil excavation in Alternatives 4, 5A and 5B. Short-term effectiveness is almost the same for Alternatives 3, 4, 5A and 5B.

Long-Term Effectiveness and Permanence

Alternatives 1 and 2 would not provide adequate long-term effectiveness and permanence for the removal of contaminants from the aquifer or soil. They would rely mainly on natural attenuation mechanism. Alternative 3 would be effective in the long term as long as the water district continued to operate.

Alternatives 4, 5A & 5B would have long-term effectiveness and permanence due to the removal of contaminated soils. Alternative 4 would provide long-term effectiveness and permanence for groundwater as contaminated groundwater at the source would be recovered and treated. Alternatives 5A and 5B could also provide a degree of long-term effectiveness and permanence for the groundwater by actively remediating groundwater plume. However, their degree of effectiveness is hard to determine due primarily to the low yield of the aquifer and also due to the effects of mechanisms at work within the aquifer. Mechanisms at work during transport of PCE and its breakdown products include volatilization, sorption , desorption, leaching, diffusion, transformation, degradation and mixing. The effects of these mechanisms along with factors such as the aquifer thickness, transmissivity and recharge are difficult to model and make it difficult to accurately predict the effectiveness of these alternatives.

Reduction of Toxicity, Mobility and Volume

Alternatives 1, 2 and 3 would not provide any reduction in the toxicity, mobility and volume of contaminants at the site. Any reduction of contaminants would be solely by natural attenuation processes.

Alternatives 4, 5A & B include removing source of soil contamination, thus greatly reducing mobility of contamination in the soil. Alternatives 4, 5A and B would, in addition, reduce toxicity, mobility and volume of contaminants by treating the on-site groundwater plume. Alternative 5A utilizes an innovative alternative technology that permanently treats contamination in-situ, and does not require off-site treatment or disposal of GAC filters as does Alternative 5B - Pump and Treat. Thus Alternative 5A would provide greater reduction of contaminant toxicity, mobility and volume.

Implementability

Alternative 1 would be easily implemented since it involves minimal remedial activities. Alternatives 2 and 4 would be easily implemented but would require an increased level of remedial activities compared to Alternative 1.

The Implementability of Alternative 3 would be problematic because it would involve several institutional and administrative issues such as the formation of a water district; and an agreement with another community to extend water supplies to the Village of Valley Falls.

Alternatives 5A and B are not technically implementable. Pumping the aquifer to reduce contamination below the NYSDOH SCGs value is technically impracticable because of the widespread area of low levels of PCE in the bedrock fractures. Also, pumping of bedrock wells could result in the residential wells of over 100 homes (that depend on the bedrock aquifer as a source of water supply) going dry and/or inducing low levels of PCE in the wells that are currently clean. Collection of all contaminated groundwater above the NYSDOH MCL in the aquifer would require the construction of approximately 2000 linear feet of iron wall through this residential area and would therefore not be practicable or cost effective.

Cost

The costs for the six alternatives range from $49,000 to $1.9 million. The total costs for Alternatives 1 and 2 are $50,499 and $46,900 respectively. Costs for remedial Alternative 3 are estimated at $1,948,400. The estimated cost for Alternative 4 is $82,500. The remedial costs for Alternatives 5A and 5B are $276,000 and $280,000 respectively. Table 2 shows the cost comparison for the six remedial alternatives.

Community Acceptance

Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan have been evaluated. The "Responsiveness Summary" included as Appendix A presents the public comments received and the Department's response to the comments. In general the public comments received were supportive of the selected remedy.

SECTION 7: SUMMARY OF THE SELECTED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 6, the NYSDEC is proposing Alternative 4 as the remedy for this site.

This alternative is selected because it provides protection of human health and the environment by actively removing sources of continuous contamination. It is preferred over Alternatives 1,2 and 3 because it provides for contaminant source removal. It is preferred over Alternatives 5A and B because it provides for remediation of the highly contaminated groundwater at the source in a more cost-effective manner and because it is also technically and administratively implementable. The principal threats to human health, the ingestion of and dermal contact with on-site surface soil and the ingestion of contaminated groundwater will be mitigated. This alternative is also cost effective in relation to the other alternatives that meet the project goals and address mitigation of contaminated groundwater.

The following is a description of the preferred remedy:

Contaminated Private Wells:

Replace individual contaminated drinking water wells with bedrock wells or provide GAC/UV systems on the affected wells. (Individuals will be given an option between well replacement or GAC maintenance)

Source Removal:

Remediate on-site soil (source) using excavation and off-site disposal of approximately 75 cubic yards of contaminated soil. See Figures 3a and 3b for a summary of on-site soil sample analytical results and the area of soil excavation respectively.

Decommission abandoned fuel tank, septic tank, associated pipes and dry well.

Groundwater Remediation:

Groundwater will be recovered from the excavation pit and treated prior to disposal.

The monitoring wells and the affected private water supply wells will be monitored semi-annually for a period of five years. At the end of the 5 year monitoring period, the site will be evaluated to determine the effectiveness of the remedial actions.

The selected remedy will also include a remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Any uncertainties identified during the RI/FS will be resolved.

The estimated present worth cost to implement the remedy is $82,500. The cost to construct the remedy is estimated to be $60,000 and the estimated average annual operation and maintenance cost for 5 years is $4,920.

SECTION 8: <u>HIGHLIGHTS OF COMMUNITY PARTICIPATION</u>

As part of the remedial investigation process, a number of Citizen Participation (CP) activities were undertaken in an effort to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- A repository for documents pertaining to the site was established.
- A site mailing list was established which included nearby property owners, local political officials local media and other interested parties.
- Fact Sheets were sent to the community to inform them of the status and current activities at the Valley Falls Dry Cleaner Site.
- Two Public Meetings were held to present information to the community.
- In February 1998 a Responsiveness Summary was prepared to address the comments received during the public comment period for the PRAP.

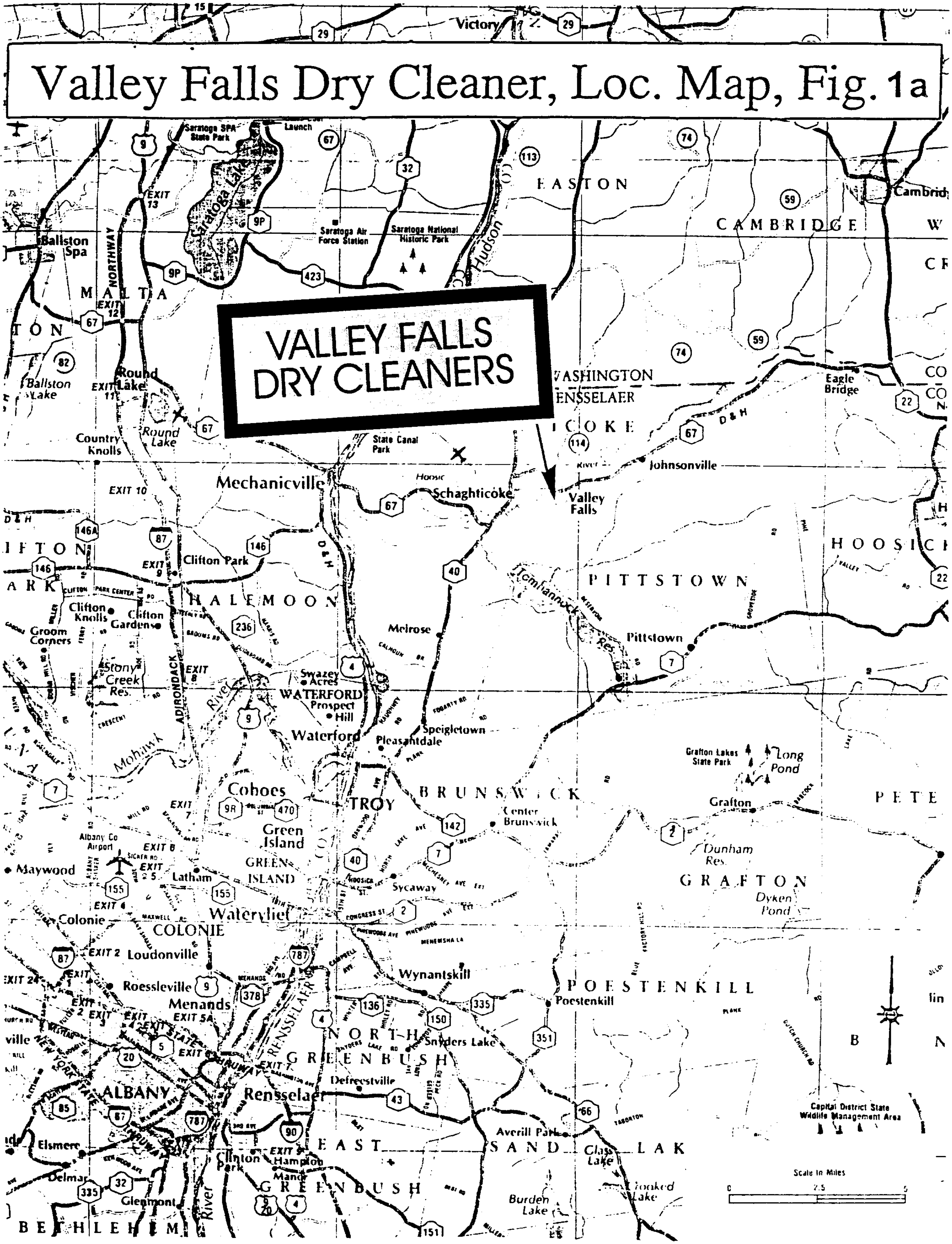
Table 1
Nature and Extent of Contamination

MEDIA	CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppb)	FREQUENCY of EXCEEDING SCGs	SCG (ppb)
Groundwater	Volatile Organic Compounds (VOCs)				
		Tetrachloroethene (PCE)	ND-350	7 of 16	5.0
		Trichloroethene (TCE)	ND-26	4 of 16	5.0
		Dichloroethene (DCE)	ND-52	4 fo 16	5.0
Soil	Volatile Organic Compounds (VOCs)	Tetrachloroethene (PCE)	ND-170,000	15 of 29	840
		Trichloroethene	ND-31	0 of 29	840
		Dichloroethene	ND-26	0 of 29	840

ND = Not Detected, less than 5 parts per billion

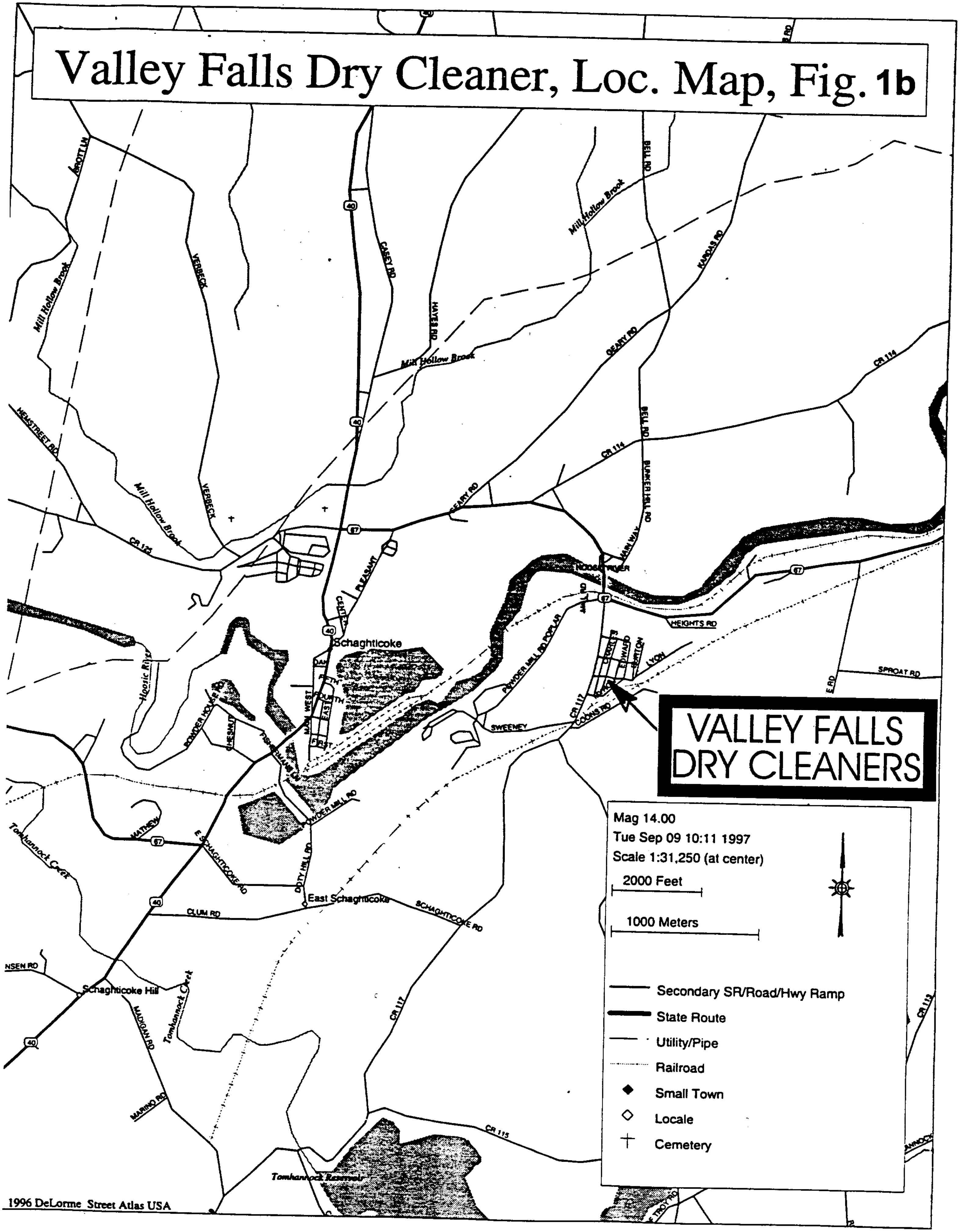
Table 2
Remedial Alternative Costs

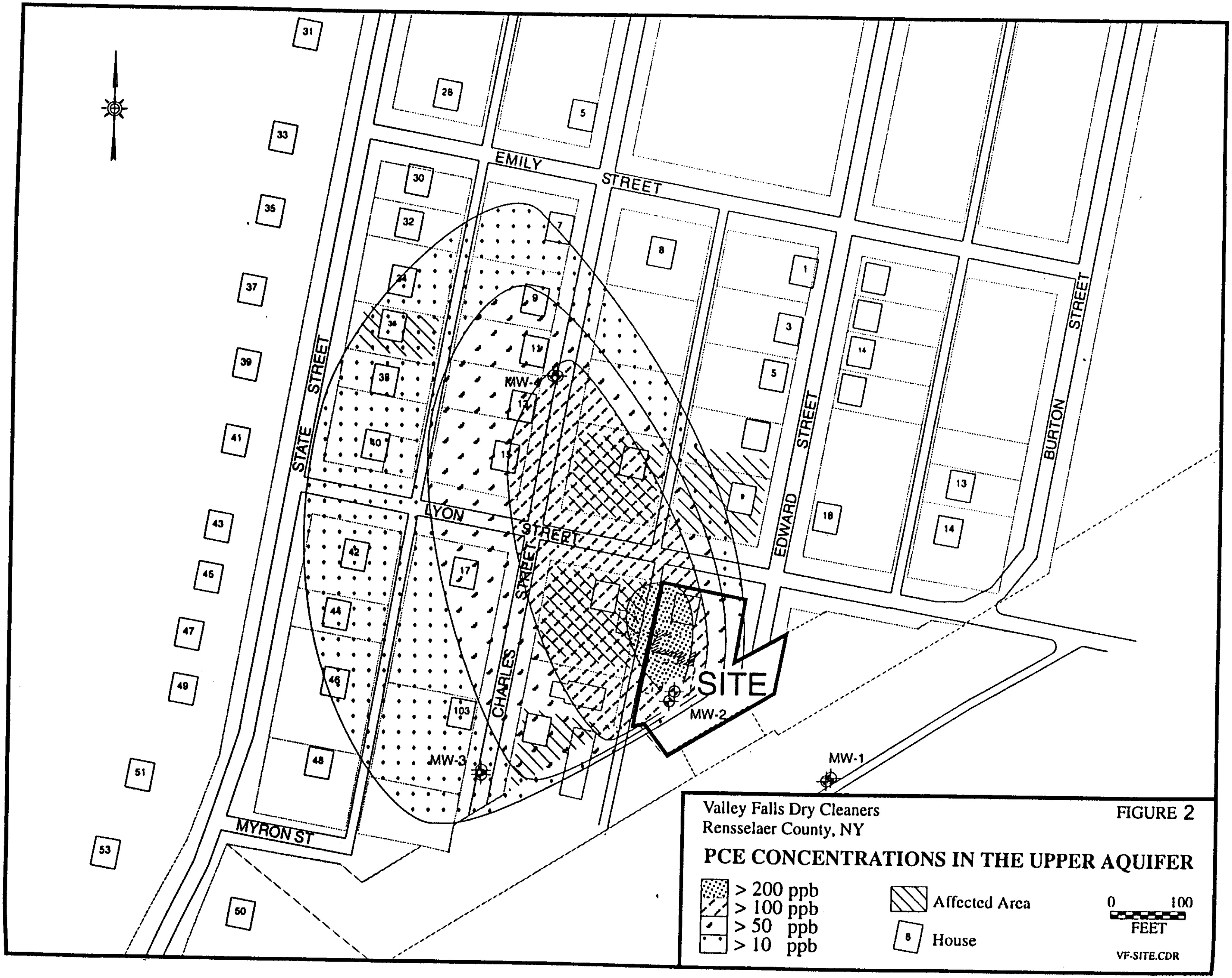
Alternative	Estimated Capital Cost	Annual O&M Cost	Estimated Total Cost
No. 1 No Action	$400	$10,920	$50,400
No. 2 Contaminated Well Replacement & Treatment	$24,400	$4,920	$48,900
No. 3 Public Water Supply	$1,933,400	$3,500	$1,948,400
No. 4 On-Site Soil (Source) Cleanup and Contaminated Well Development or Treatment	$60,000	$4,920	$82,500
No. 5A On-Site Soil (Source) and Shallow Aquifer Remediation (Reactive Wall)	$242,000	$7,400	$276,000
No. 5B On-site Soil (Source) and Shallow Aquifer Remediation (Pump & Treat)	$209,000	$15,500	$280,000



Valley Falls Dry Cleaner, Loc. Map, Fig. 1a

Valley Falls Dry Cleaner, Loc. Map, Fig. 1b





Valley Falls Dry Cleaners
Rensselaer County, NY

FIGURE 2

PCE CONCENTRATIONS IN THE UPPER AQUIFER

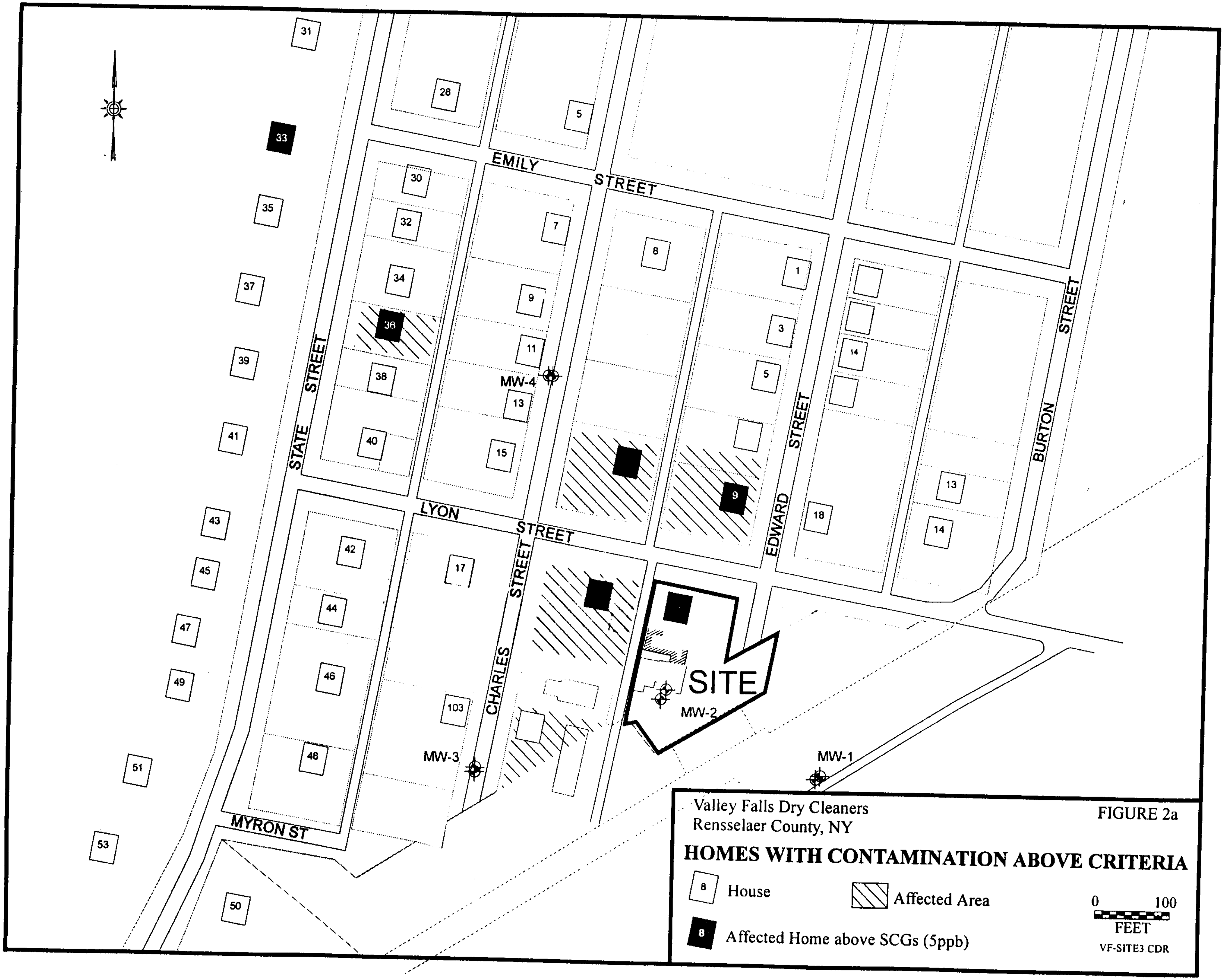
> 200 ppb
> 100 ppb
> 50 ppb
> 10 ppb

Affected Area

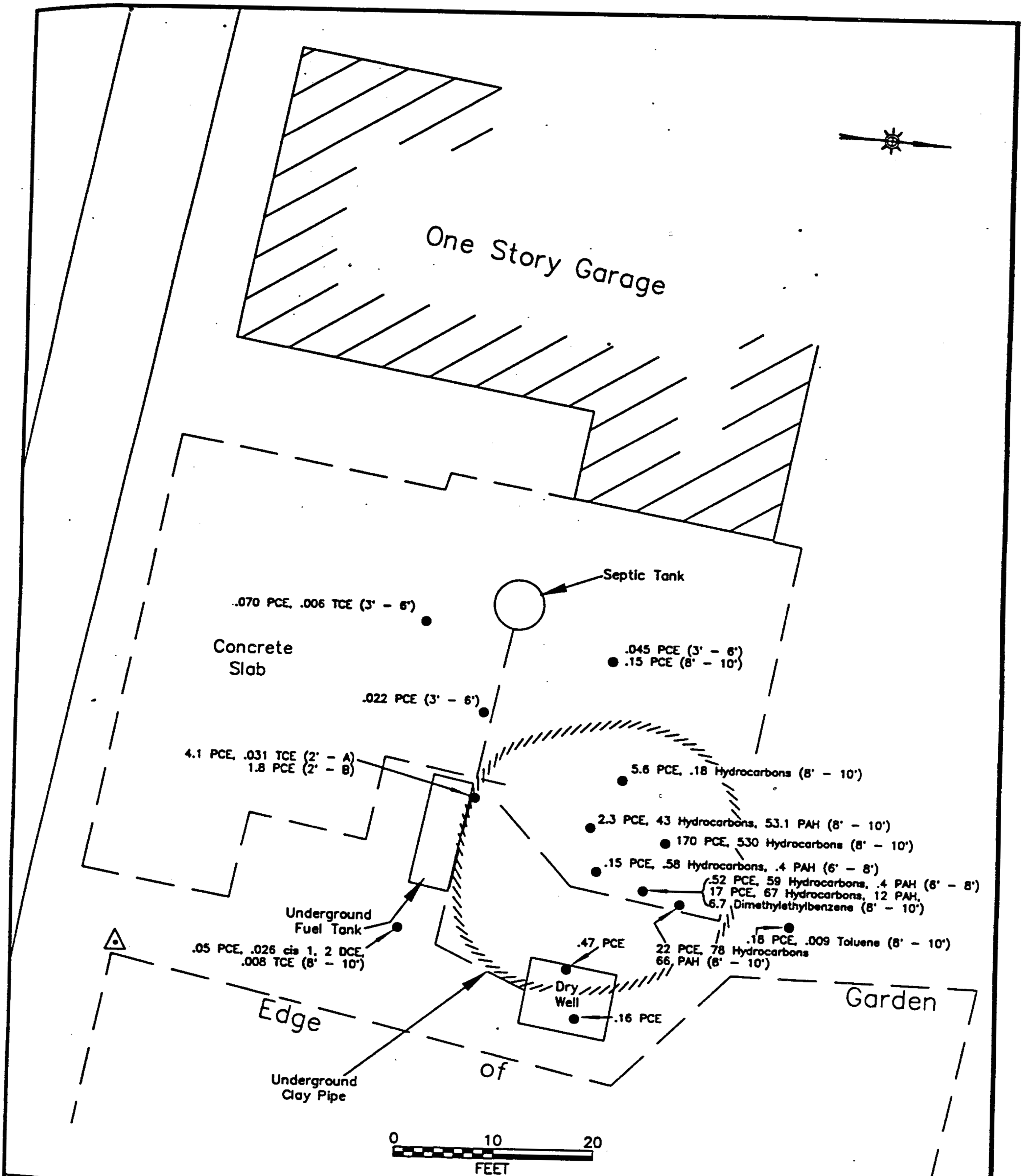
House

0 100 FEET

VF-SITE.CDR



Valley Falls Dry Cleaners
Rensselaer County, NY
FIGURE 2a
HOMES WITH CONTAMINATION ABOVE CRITERIA
House
Affected Area
Affected Home above SCGs (5ppb)
0 100
FEET
VF-SITE3.CDR
EMILY STREET
LYON STREET
STATE STREET
CHARLES STREET
EDWARD STREET
BURTON STREET
MYRON ST
SITE
MW-1
MW-2
MW-3
MW-4
31
28
5
33
30
32
34
36
38
40
35
37
39
41
43
45
47
49
51
53
50
42
44
46
48
17
103
7
9
11
13
15
8
1
3
5
9
14
18
13
14



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)

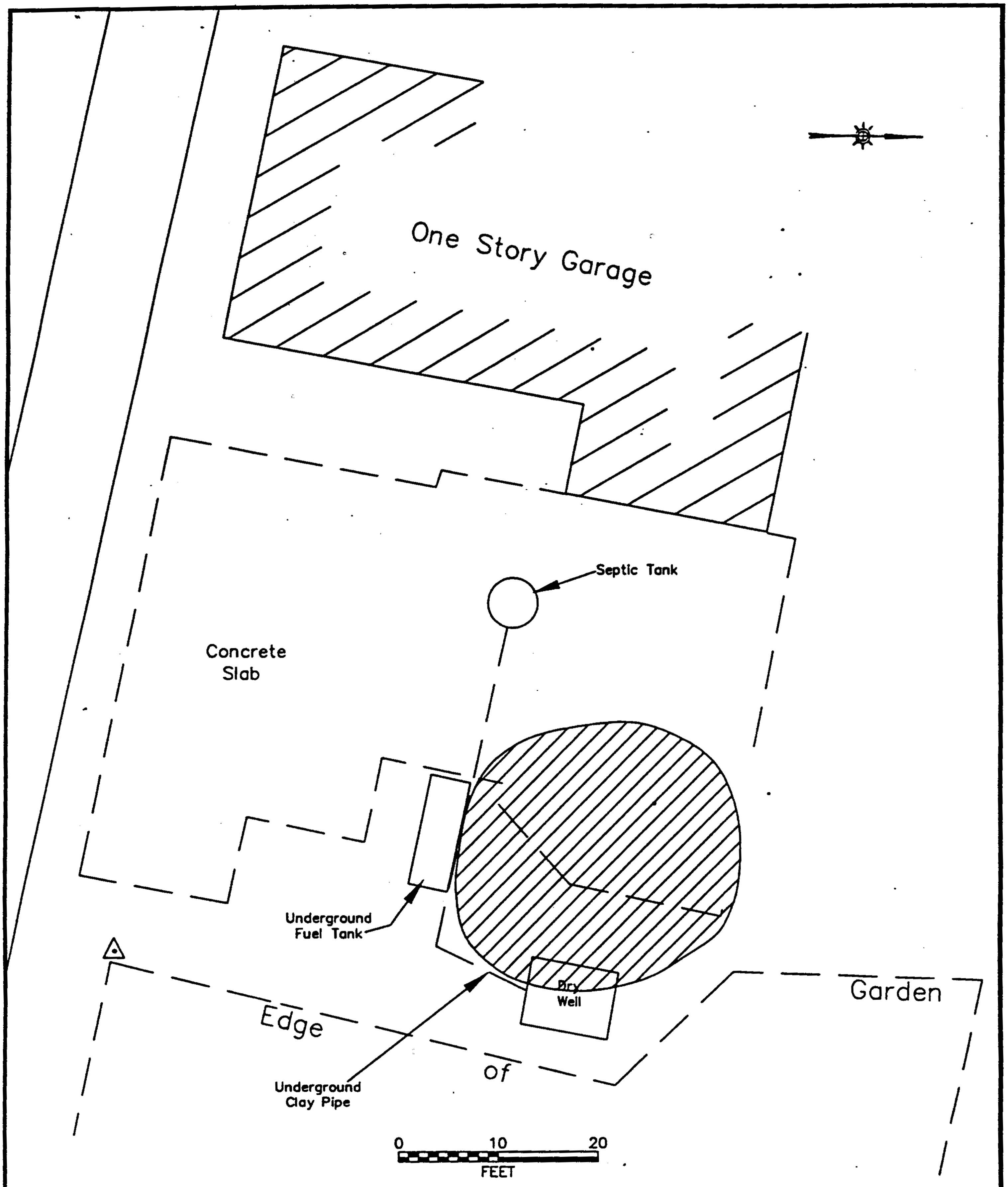
All concentrations in Parts Per Million

Figure 3a

Valley Falls Dry Cleaners

Summary of On-site Soil Sample Analytical Results

vf-fig2.dwg



KEY

Area of Excavation

Figure 3b

Valley Falls Dry Cleaners

APPENDIX A

RESPONSIVENESS SUMMARY

Valley Falls Dry Cleaner Site
Site No. 4-42-028
Village of Valley Falls
Rensselaer County, NY

RESPONSIVENESS SUMMARY

This Responsiveness Summary was prepared to answer the public's comments about the New York State Department of Environmental Conservation's (NYSDEC) Proposed Remedial Action Plan (PRAP) to deal with the contaminated soils and groundwater at the Valley Falls Dry Cleaner Site.

The NYSDEC invited the public to comment on the proposal through a mailing to the site's contact list and at a public meeting held on January 28, 1998. This Responsiveness Summary addresses all questions and comments on the proposed remedy received at the public meeting and during the public comment period which ran from January 21, 1998 through February 21, 1998. These comments have become part of the Administrative Record for this site.

The following are the comments received with the NYSDEC's responses:

Comment 1: The DEC Geologist stated that the two most likely conduits of contamination, from the shallow (sand and gravel) aquifer into the bedrock (deep) aquifer, are:

(a) Leakage down the residential well casings from the contaminated sand and gravel down through the aquitard till layer;

(b) very slow percolation of the contamination through any possible areas where the till layer is more permeable.

Based on these conclusions, would you say that the contamination levels in bedrock wells are gradually increasing?

Response 1: No, the concentrations of contaminants in the bedrock aquifer seem to be fairly constant over time. The dry cleaning operation has been closed for over 20 years, and therefore the groundwater contamination is residual from contamination that occurred a long time ago. Low levels of PCE, in the 1 ppb to 5 ppb range, do seem to be slowly spreading downgradient of the site in the bedrock aquifer.

Comment 2: In your proposed remedy, how deep do you think the replacement wells will be? Residents attending the meeting affirmed a range of depth of 125 - 140 feet for their present wells.

Response 2: Most fractures and fissures in the bedrock are usually near the top of rock, and wells are drilled deeper for storage. Any replacement wells will have well casings grouted in place or will be double cased to prevent leakage from the upper sand and gravel layers above. Casings would be grouted 5 to 10 feet into rock. We don't know exactly how deep replacement wells would be, perhaps 250 to 300 feet. We would drill to optimize well yield.

Comment 3: We have been receiving sampling results of our well since 1994. I have 1.2 parts per billion in my well. What level of contamination should we be concerned about?

Response 3: The NYS Department of Health has set a drinking water standard for public water supplies of 5 parts per billion (5 ppb). This standard is used as a guidance value for private water supplies.

Comment 4: What was the level of contamination in the most contaminated well?

Response 4: The highest concentration of PCE contamination detected in a residential well is 210 ppb.

Comment 5: Right now I have water in my basement. I know there is a drainage easement that runs through the dry cleaner site and into my property. Do you know about this? Have you factored this into your plans for the site remediation?

Response 5: We do not believe that the Proposed Remedial Action would have any effect on the drainage in question. This would be further evaluated during the design of the remedy.

Comment 6: For those of us residents who have traces of contamination in our private wells, will we continue to have our wells tested during and after the site remediation?

Response 6: A monitoring plan will be developed at the completion of the remedial action. This plan will include monitoring of all the wells at risk from the contamination at the Valley Falls Dry Cleaner site.

APPENDIX B

ADMINISTRATIVE RECORD INDEX

The following documents are included in the Administrative Record:

1. Final Work Plan, Remedial Investigation/Feasibility Study, NYSDEC, November 1995

2. Remedial Investigation Report, Volume I & II, NYSDEC, December 1996

3. Feasibility Study Report, NYSDEC, January 1998

4. Proposed Remedial Action Plan, NYSDEC, January 1998