Department of Environmental Conservation

Division of Hazardous Waste Remediation

Roxy Cleaners Site

Site Number 4-42-024
Town of North Greenbush
Rensselaer County, New York

Record of Decision

March 1994

New York State Department of Environmental Conservation
MARIO M. CUOMO, *Governor* LANGDON MARSH, *Acting Commissioner*

ROXY CLEANERS SITE
TOWN OF NORTH GREENBUSH, NEW YORK
SITE NO.: 4-42-024

RECORD OF DECISION
MARCH 1994

PREPARED BY:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION

DECLARATION STATEMENT - RECORD OF DECISION

Roxy Cleaners Inactive Hazardous Waste Site
Town of North Greenbush, Rensselaer County, New York
Site No. 442024

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the Roxy Cleaners 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 Roxy Cleaners Inactive Hazardous Waste Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography of the documents included as a part of the Administrative Record is included in Appendix A 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 Roxy Cleaners Site and the criteria identified for evaluation of alternatives, the NYSDEC has selected the following remedy for the Site:

Water Supply Alternative: PW-2

** Extension of the public water supply line from Troy City to the area of Wynantskill impacted by groundwater contamination emanating from the Roxy Cleaners Site.

Prerequisites for the installation of the public water service part of the remedy are:

1. Formation of a water district by the local residents that includes the site-impacted properties.

2. Agreement by the City of Troy to sell water to the Water District.

Groundwater Alternative: GW-3

** Installation of a groundwater pump and treat system whereby contaminated groundwater will be collected from the on-site bedrock and overburden aquifers and off-site overburden aquifer via wells, treated by air stripping with vapor phase carbon adsorption and discharged to the Wynantskill Creek.

The primary goals of the groundwater pump and treat portion of the remedy will be:

(1) to reduce the mass and concentration of contaminants in the groundwater,
(2) to control migration of the groundwater contamination, and
(3) to reduce the generation of contaminated soil gas vapors near the site.

The final remedy will also include:

** A performance monitoring program for the groundwater treatment system;

** Environmental monitoring of a comprehensive network of monitoring wells;

** Maintenance and monitoring of Granular Activated Carbon (GAC) filters on the contaminated private wells until the public water service is operational for the affected properties; and

** Reassessment of the implementability of the water supply portion of the remedy in three years if a water district has not been formed and an agreement with Troy to supply water has not been reached.

** Five year review of the Remedial Program for the site.

The total capitalized cost of the remedy is:

Element	Cost
Water Supply Alt. PW-2	$ 643,500
Groundwater Alt. GW-3	$ 1,300,000
Total Cost =	$ 1,943,500

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 statutory preference for remedies that reduce toxicity, mobility, or volume as a principal element.

March 7, 1994
Date

Ann Hill DeBarbieri
Deputy Commissioner

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SECTION 1: SITE LOCATION AND DESCRIPTION

The Roxy Cleaners Site (No. 4-42-024) is located within the unincorporated hamlet of Wynantskill in the Town of North Greenbush in Rensselaer County, New York. The Roxy Cleaners building is within 200 feet of the intersection of NYS Route 66 (Main Avenue) and NYS Route 150 (West Sand Lake Road), and 300 feet north of the Wynantskill Creek. See Figure No. 1 Site Location Map.

Roxy Cleaners is one of two business tenants occupying a 35,000 square foot lot at the corner of Main Avenue and Orchard Terrace. Other properties in the vicinity of the Roxy site consist of single family residences and small businesses such as gas stations, restaurants and small shops. The commercial properties are situated along Main Avenue which, in this area, parallels the Wynantskill Creek.

The residential properties are located on side streets starting at Main Avenue and rising up the slope to the north. There is another residential area within the Wynantskill floodplain on the opposite side of the creek. See Figure No. 2 Site Vicinity Map.

SECTION 2: SITE HISTORY

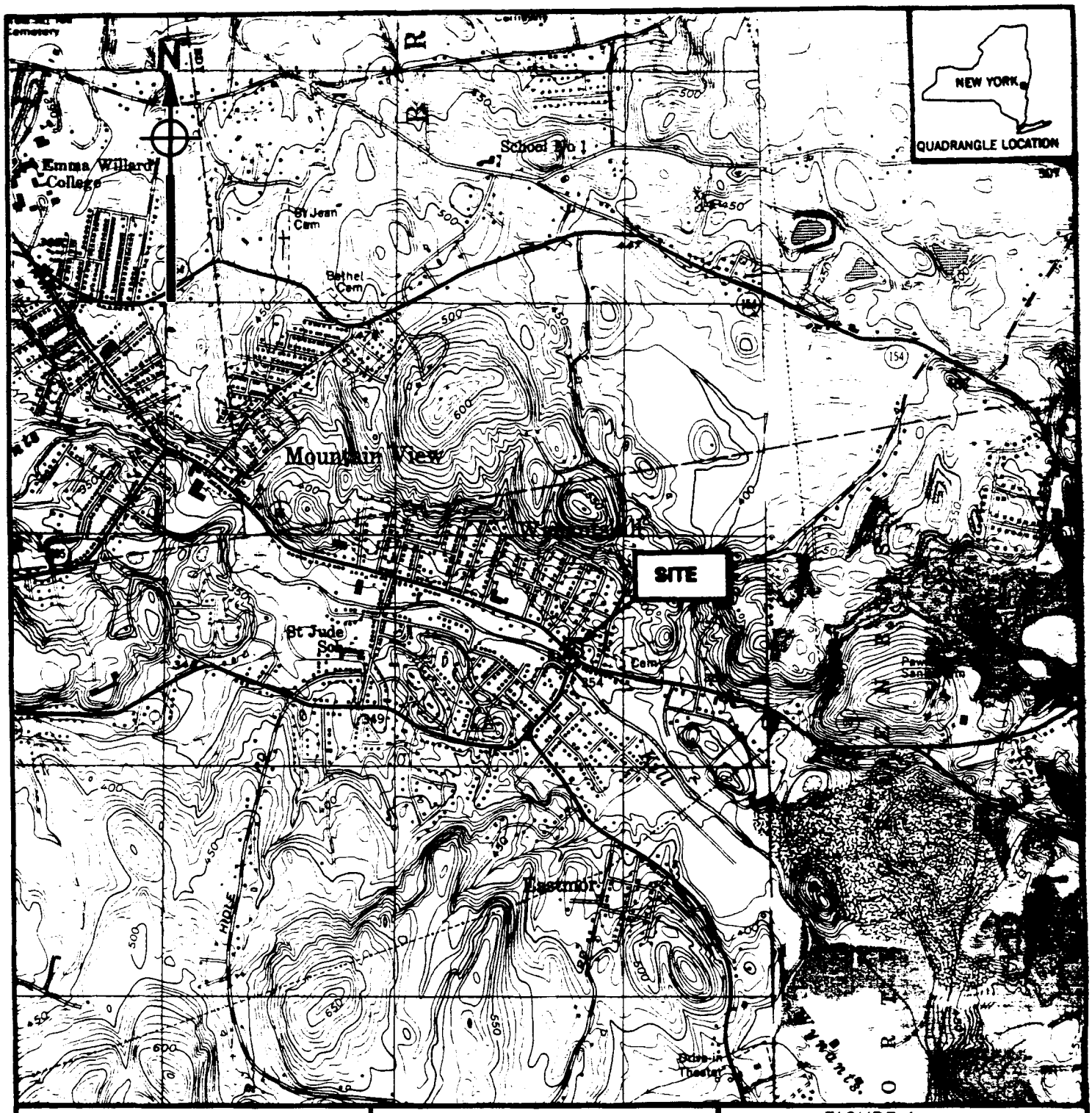
The following is a chronological history of the site and the remediation project.

Subsection 2.1:

1959
Roxy Cleaners, Inc. leased commercial property from Mardigian Property, Inc. and established a branch of their fabric dry cleaning operation at 195 Main Avenue in the Hamlet of Wynantskill. The operation utilized commercial grade tetrachloreothylene otherwise known as perchloroethylene, "perc", or PCE. Commercial grade PCE is less than pure, and significant amounts of other chlorinated solvents, mainly trichloroethylene and dichloroethylene are present.

1984
An unreported spill of 55 gallons of perchloroethylene allegedly occurred outside near the rear of the building.

1959 thru 1987
Other undocumented events and practices occurred during the period of operation which may have contributed to site contamination.



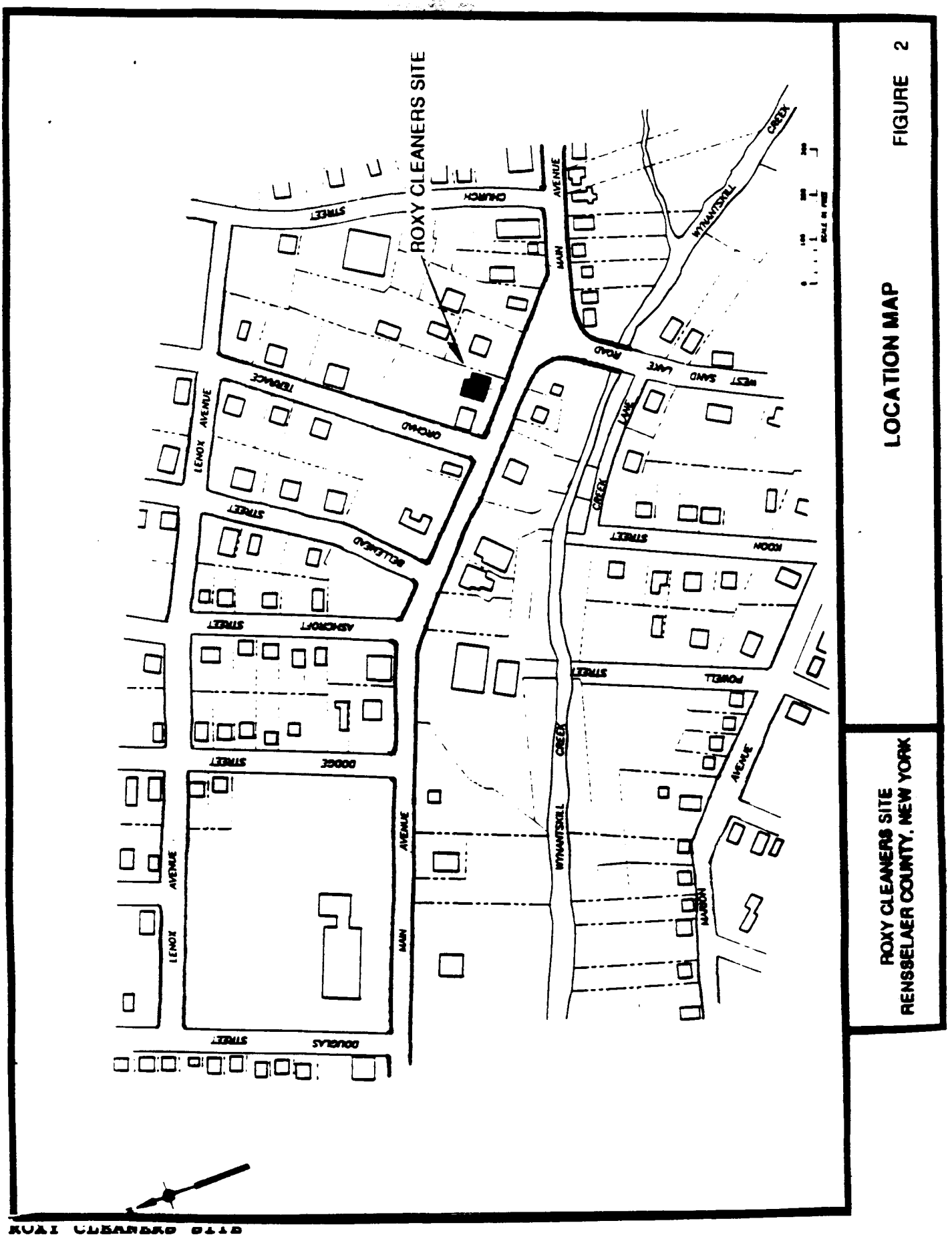
SOURCE: USGS 7.5 Minute Series Topographic Map Troy South and Averill Park (1953), NY Quadrangles Photorevised 1980

1000 0 1000 2000 3000

SCALE IN FEET
1" = 2000 FEET
CONTOUR INTERVAL = 20 FEET

FIGURE 1
SITE LOCATION
ROXY CLEANERS SITE
NORTH GREENBUSH, NEW YORK

Metcalf & Eddy of New York, Inc.
A Metcalf & Eddy Company


ROXY CLEANERS SITE
LOCATION MAP
FIGURE 2
ROXY CLEANERS SITE
RENSSELAER COUNTY, NEW YORK

1988
By 1988, actual dry cleaning at the Wynantskill facility had ceased. Since that time, the building has been used only as a distribution center for Roxy Cleaners, Inc; solvents are no longer delivered to or disposed of from the Wynantskill facility.

Subsection 2.2:
Remedial History

5/3/89:
Roxy United Cleaners, Inc. informed the NYSDEC of perchlortheylene contamination in the private water supply well shared by both Roxy Cleaners and the adjacent commercial tenant to the west. Another sample was immediately taken for analysis, and perchloroethylene was found at a level of 1370 ppb. This concentration exceeded the drinking water guidelines of 5 ppb.

5/89 thru present:
During May, 1989 Roxy United Cleaners Inc. contracted for the laboratory analysis of 18 other private wells in the vicinity of the site.

The NYSDEC Department of Health (NYSDOH) and the Rensselaer County Health Department initiated a comprehensive sampling program of private wells potentially affected by contamination from Roxy. Forty-seven properties were sampled in June, and many properties were resampled in July, August, September 1989, and again in January and February of 1990. Sixteen private drinking water wells were found to contain the chemicals of concern in excess of drinking water standards. NYSDOH continues to sample private wells every six months to monitor any further spread of contamination.

6/89 and continuing through present:
Roxy United Cleaners, Inc. signed a temporary Consent Order with the NYSDEC. In the order, Roxy agreed to install and, for four months, maintain carbon filters on 16 private wells that contained site related contamination. In November, 1989, NYSDEC took over this activity from Roxy Cleaners when the company declared their financial inability to continue. At present, filters on 19 private wells are monitored and maintained by NYSDEC.

7/89 thru 1/90:
The Regional Office of NYSDEC initiated and completed a hydrogeologic investigation of the Roxy Cleaners Site contamination. Sixteen monitoring wells were installed and sampled; three well pairs were installed on-site, and five well

pairs were installed at the estimated limits of the off-site plume. Perchloroethylene was found in four wells on-site and three wells off-site. The investigation located the source of groundwater contamination, an area of heavily contaminated soil immediately behind the building.

1/90:
Perchloroethylene was detected at low, but significant, levels in indoor air sampling performed by NYSDOH in an older commercial building. NYSDEC oversaw installation of a ventilation system in the building which alleviated this potential health risk.

SECTION 3: CURRENT STATUS

The NYSDEC, under the State Superfund Program, initiated a Remedial Investigation/Feasibility Study (RI/FS) in August, 1990 to address the contamination at the site.

Subsection 3.1: Remedial Investigation

The purpose of the Remedial Investigation (RI) was to define the nature and extent of any contamination resulting from previous activities at the site. Data from the RI was used to define remedial goals for the remedial alternatives which were evaluated in the Feasibility Study.

The first phase RI was conducted between November, 1991 and March, 1992. A report entitled "Phase I Remediation Investigation Report Volume I & II, November, 1992" was prepared describing the field activities and findings of the RI in detail. A summary of the Remedial Investigation follows:

1. A groundwater sampling program was performed. The existing sixteen monitoring wells were first sampled and analyzed for volatile chemicals. This sampling was used to provide current data on the concentrations of volatile organic chemicals in the groundwater at the Roxy Cleaners Site and to locate points for additional monitoring.

2. Hydrogeologic and soil investigation programs were performed. Nine soil borings and nine new monitoring wells were installed in order to evaluate the nature and extent of contamination within overburden soils and to assess the potential for contaminant migration through overburden and bedrock aquifers.

3. A second round of groundwater sampling and analysis of all twenty-five wells was performed in order to define the

physical extent of the contaminant plume and the variation in contaminant concentrations.

4. An extensive soil gas survey was performed which determined the distribution and extent of chlorinated solvents within the unsaturated soils above the water table and mapped the areas affected by the overburden plume.

5. Sampling and analyses of the adjacent Wynantskill Creek were performed in order to determine if site-related contamination has impacted the stream environment.

The analytical data obtained from the RI was compared to Applicable Standards, Criteria, and Guidance (SCGs) in determining remedial alternatives. Groundwater, drinking water and surface water SCGs identified for the Roxy Cleaners Site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of the NYS Sanitary Code. NYSDEC used soil cleanup guidelines for the protection of groundwater, risk-based remediation criteria and background quality information to evaluate the results of soil and sediment samples and to develop remedial goals for soil.

Based upon the results of the remedial investigation in comparison to SCGs and potential public health and environmental exposure, certain areas and media of the site require remediation.

Site Related Chemicals of Concern

Data from the past sampling and the RI indicate that there are three contaminants of concern, perchloroethylene (tetrachloroethylene), trichloroethylene and 1,2 dichloroethylene. These contaminants are the principal chlorinated volatile organic solvents found in commercial grade perchloroethylene. The applicable standards for drinking water and for groundwater are 5 micrograms per liter (parts per billion) for each of these contaminants.

Perchloroethylene and trichloroethylene are both classified as Probable Human Carcinogens. 1,2 Dichloroethylene is not considered a carcinogen. In addition to perchloroethylene's probable ability to cause cancer, it can produce acute effects through inhalation exposure. These effects include symptoms such as dizziness, confusion, nausea, headache, eye and mucous membrane irritation. In contrast, acute doses of trichloroethylene and dichloroethylene are relatively non toxic. A detailed summary of the data from the RI is as follows:

Groundwater

During November, 1991, groundwater samples were collected from the sixteen monitoring wells installed in 1989. Results of this sampling event and the subsequent soil gas survey were used in placing additional monitoring wells during the RI. Upon installation of nine new monitoring wells, another round of groundwater samples was collected and analyzed in February, 1992. In this round, the new upgradient well pair was sampled for the full range of target compounds in order to establish natural (representative) background concentrations in the area and in the overburden aquifers. Following are Table No. 1 and Table No. 2, which provide a summary of contaminant concentrations that were detected in the two rounds of sampling, and Figure No. 3 and Figure No. 4, which illustrate the location of the plume of groundwater contamination.

The results from continued monitoring of private drinking water wells by the NYS Department of Health (NYSDOH) has necessitated increasing the number of private wells with granular activated carbon (GAC) filters from 16 in 1989 to 19 in 1993. This is because 3 additional wells were determined to be at risk of exceeding drinking water standards.

Soil Gas

Perchloroethylene has a low affinity for adsorption to soil particles; the chemical also readily volatilizes out of solution from the more concentrated portions of the overburden contaminant plume, so that air present between soil particles (soil gas) contains measurable amounts of the site-related contamination.

The soil gas survey in the remedial investigation successfully mapped the areas of contamination, see Table No. 3 and Figure No. 5. The areas of contaminated soil gas extended west from the site along Main Avenue and also turned south toward the Wynantskill Creek. These findings concurred with the location of the plume of contaminated groundwater estimated from the results of the groundwater sampling program.

Cracks in basement walls, dirt floors, and other openings may allow the introduction of this soil gas into the indoor air, which happened in one of the older, commercial buildings downgradient of the site. These conditions were discovered and corrected after a preliminary soil gas survey in 1989. DOH tested the indoor air and had a venting system installed.

Table No. 1
Summary of Concentration Range of Chemicals of Concern
Found in Overburden Monitoring Wells
During Remedial Investigation

Chemical of Concern	Groundwater and/or Drinking Water Standards	Range of Detected Concentrations	Number of Overburden Wells Above Standards
Perchloroethylene (tetrachloroethylene)	5 ppb	2-13,000 ppb	4
Trichloroethylene	5 ppb	10-120 ppb	3
1,2 Dichloroethylene	5 ppb	4-150 ppb	3

Table No. 2
Summary of Concentration Range of Chemicals of Concern
Found in Bedrock Monitoring Wells
During Remedial Investigation

Chemical of Concern	Groundwater and/or Drinking Water Standards	Range of Detected Concentrations	Number of Bedrock Wells Above Standards
Perchloroethylene	5 ppb	4-2300 ppb	3
Trichloroethylene	5 ppb	4-33 ppb	2
Dichloroethylene	5 ppb	5-52 ppb	3

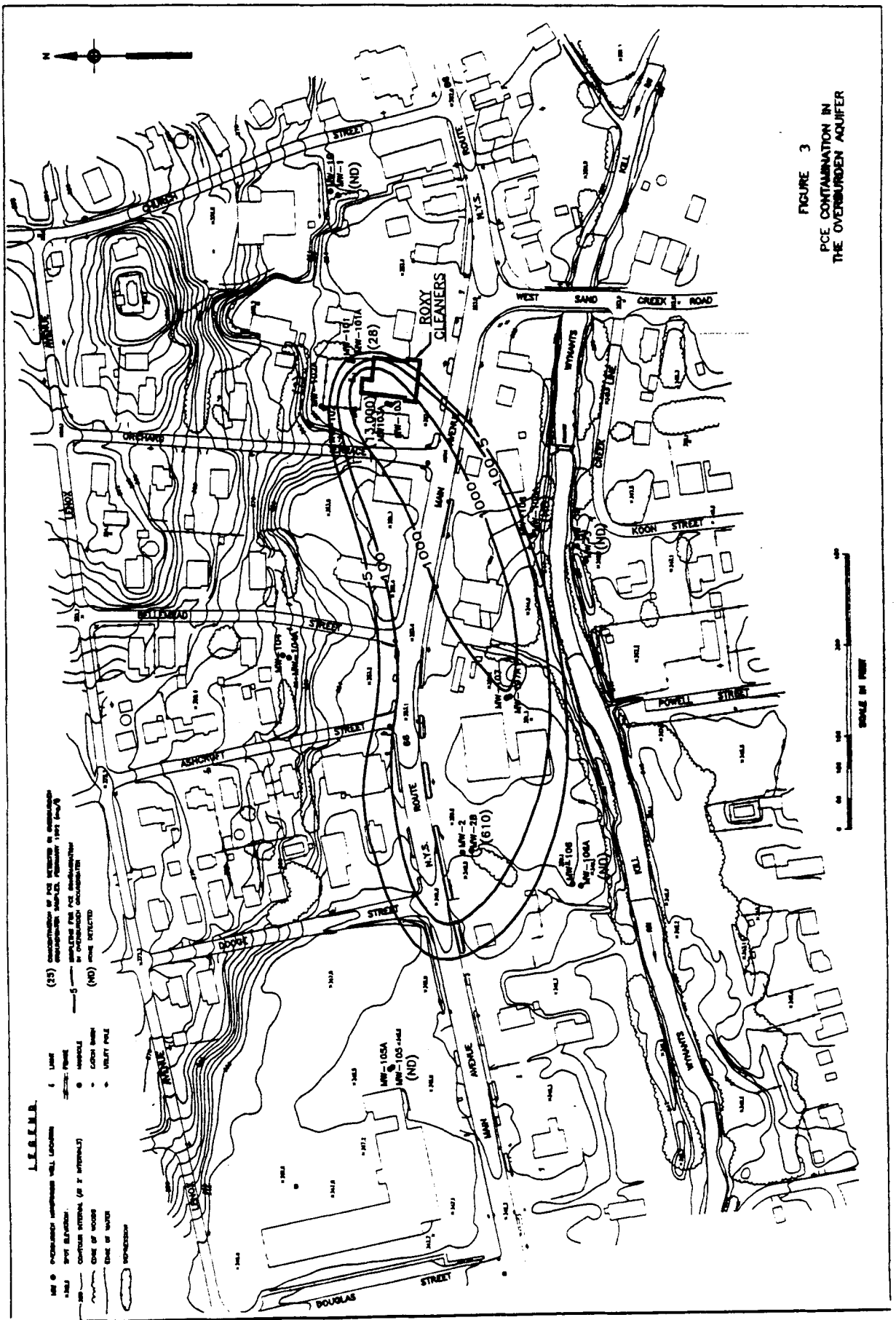


FIGURE 3
PCE CONTAMINATION IN THE OVERBURDEN AQUIFER

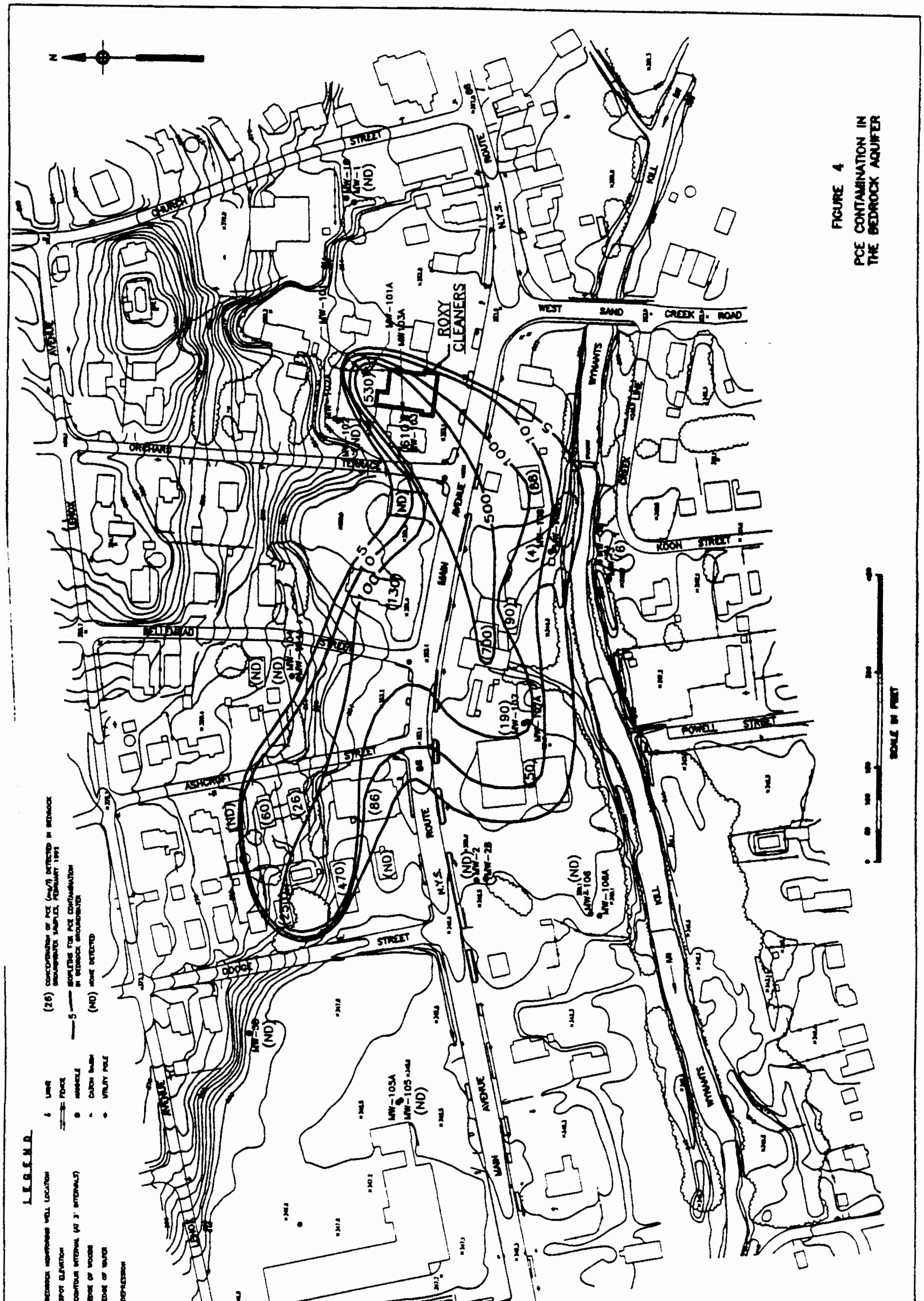


FIGURE 4
PCE CONTAMINATION IN THE BEDROCK AQUIFER

Table No. 3
Soil Gas Survey
Perchloroethylene Concentrations

No. of Testing Points within Concentration Ranges

Non-detect	1-10 ppb	10-1000 ppb	>1000 ppb	Total No. of Soil Gas Testing Points
52	12	20	11	95

Table No. 4
Interim Remedial Measure
On-Site Vacuum Extraction

Chemical of Concern	Soil Clean-Up Objectives	Range of Soil Conc. Starting	Range of Soil Concen-tractions After IRM
Perchloroethylene (PCE)	700 ppb	13.2-2,920,000 ppb	6-425 ppb
Trichloroethylene (TCE)	500 ppb	13-105 ppb	not detected

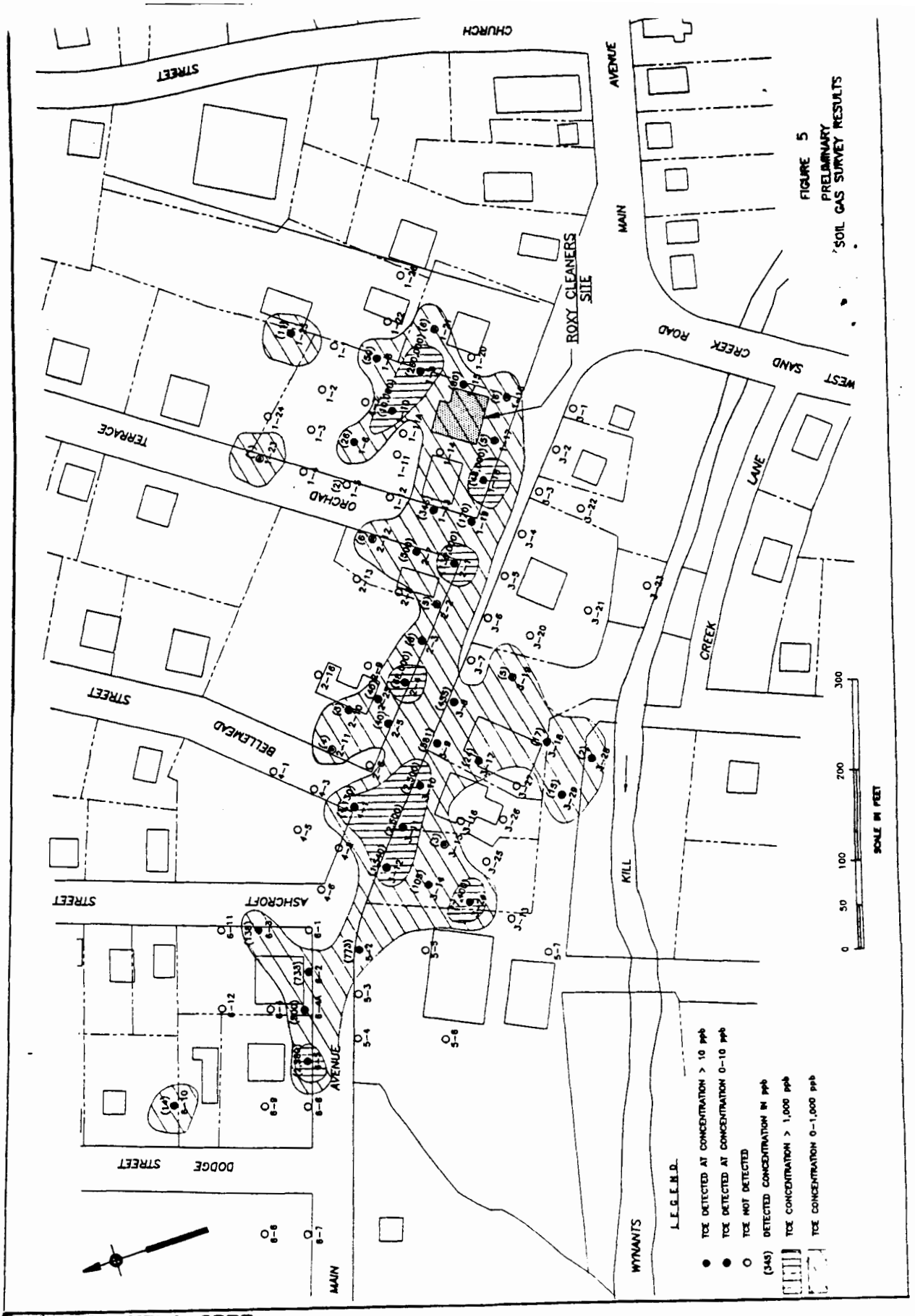


FIGURE 5
PRELIMINARY
SOIL GAS SURVEY RESULTS
ROXY CLEANERS SITE
CHURCH STREET
MAIN AVENUE
WEST SAND CREEK ROAD
TERRACE
ORCHARD
BELLEMEAD STREET
ASHCROFT STREET
DODGE STREET
MAIN AVENUE
KILL
CREEK LANE
WYNANTS
SCALE IN FEET
0 50 100 200 300
LEGEND
TCE DETECTED AT CONCENTRATION > 10 ppb
TCE DETECTED AT CONCENTRATION 0-10 ppb
TCE NOT DETECTED
(345) DETECTED CONCENTRATION IN ppb
TCE CONCENTRATION > 1,000 ppb
TCE CONCENTRATION 0-1,000 ppb

A detailed soil gas survey conducted in 1990 as part of the RI determined that an additional building, containing a basement apartment, was within the soil gas plume and at potential risk of contamination. This building was also tested by NYSDOH. Corrective measures only involved plugging small holes in the foundation and were implemented by the property owners.

Stream Sediment and Surface Water

Three paired samples of surface water and corresponding stream sediment were collected during the RI. As yet, the stream environment does not appear to be affected by site-related contamination since no detectable levels of perchloroethylene were found in any of the six samples.

Subsection 3.2:
Interim Remedial Measures

An Interim Remedial Measure (IRM) is implemented at a site when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS. An IRM was conducted at the Roxy Site while the Remedial Investigation was in progress.

In January 1992, the project consultants subcontracted with Dames & Moore to remediate the on-site source of contamination, the area of soil contamination located behind and beneath the Roxy building. A vacuum extraction system was installed around the Roxy Cleaners Building; see Figure No. 6. Shallow wells were installed into the unsaturated zone 7 - 11 ft. deep, and a vacuum was applied which volatilized the soil contaminants. From March through November of 1992, the system extracted 346 pounds of perchloroethylene gallons from on-site soils. Table No. 4 shows the soil cleanup objectives for on-site soils. The soil sample results from the preliminary site study in January, 1990 and the confirmatory soil sampling results from November, 1992 illustrate the success of the IRM soil cleanup.

Subsection 3.3:
Summary of Human Exposure Pathways

A limited Baseline Human Health Risk Assessment was conducted to evaluate the risks associated with groundwater and drinking water contamination at this site.

The results of this risk assessment, in combination with the results of the RI/FS were used to identify applicable remedial alternatives and to select a remedy. A baseline health risk assessment estimated the site-related health risks that could occur if no remedial actions are performed and if no steps are taken to

reduce human exposure. It should be noted, that at the Roxy site, granular activated carbon (GAC) treatment units have been installed on affected wells to mitigate the present risk associated with the site. In addition, a ventilation system was installed in one building, and other corrective measures were taken in another affected building near the site, in order to reduce exposure to contaminated soil gas vapors.

The components of the risk assessment for this site include:

- Identification of site-related chemicals and media of concern (e.g. groundwater contamination);
- An evaluation of the toxicity of the contaminants of concern;
- Identification of the possible exposure routes and pathways; and
- Estimating the added potential risk of experiencing health effects.

Exposure routes are the mechanisms by which contaminants may enter a human body (e.g. inhalation into lungs, ingestion into the digestive system, absorption by eyes and skin into the circulatory system).

Exposure pathways are the environmental media (e.g. groundwater, soil, air) through which contaminants are transported.

The remedial plan will be protective of both public health and the environment. The selected remedies for the Roxy Cleaners site will address the following potential exposure pathways in order to assure protection of the public health from the site-related contaminants:

- Ingestion of contaminated drinking water;
- Inhalation of volatiles;
- Dermal contact with volatiles in the groundwater.

Following are the results of the risk assessment for the worst case scenario at the Roxy Site. Worst case means that a human population is exposed for 30 years to the 95% concentration level of the maximum contamination that was detected in the monitoring wells. (See page 17 of Table 18 of Appendix H of the "Remedial Investigation Report, Volume 2").

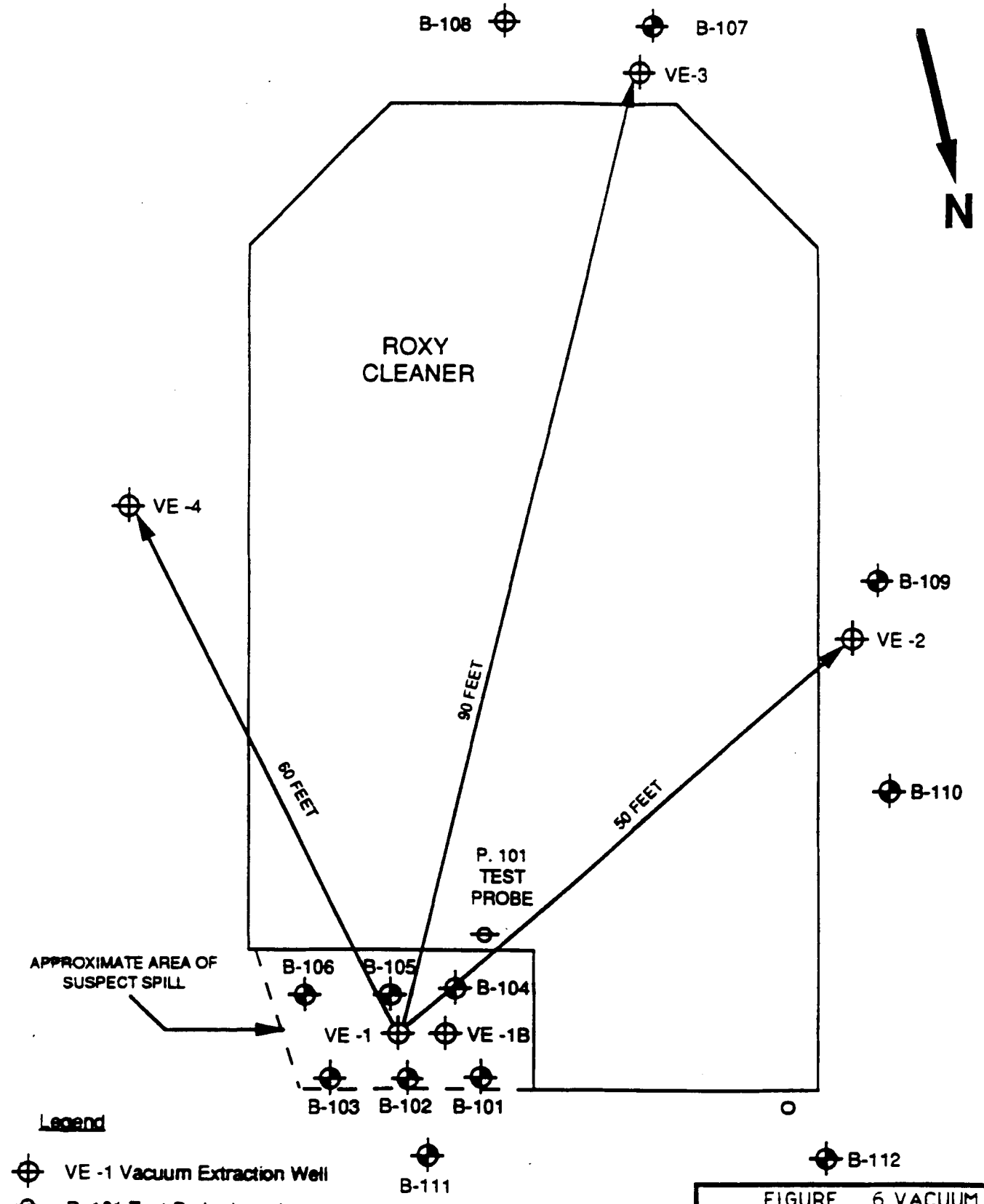


FIGURE 6 VACUUM EXTRACTION WELL LOCATIONS

ROXY CLEANERS SITE
NORTH GREENBUSH, NEW YORK

Ingestion of untreated contaminated groundwater represents the greatest potential risk from the site. This potential increased risk is estimated at 66 additional cases of cancer per 100,000.

The next greatest potential risk would be from dermal contact with contaminated groundwater. In the worst case, there could be an additional 13 cases of cancer per 100,000 people exposed. The third potential exposure, inhalation of volatiles, could increase additional cancer cases by 7 per 100,000 persons exposed.

Adding all the potential risks together, the worst case scenario from non-remediation of contaminated groundwater, would result in a potential increase of 86 additional cases of cancer per 100,000 people exposed to the site's 95% contaminant level (1100 ppb of perchloreothylene) for thirty years. This level of increased potential risks exceeds the acceptable risk range and warrants site remediation.

Currently, the 19 impacted wells are equipped with GAC filters to prevent actual exposure to the contaminants.

Subsection 3.4:
Summary of Environmental Exposure Pathways

No site-associated contamination was detected in surface water or sediments, however, the environmental assessment was conducted based upon groundwater data measured near the site. This is a conservative approach, since the concentrations of volatile organic compounds detected in groundwater are likely to decrease significantly if they migrate to the surface water. The average groundwater concentrations of perchloreothylene are in the same range as the toxicity values for aquatic organisms reported in the literature.

There is a possibility that the plume will migrate to surface water. However, perchloroethylene has a relatively low bioconcentration factor as documented by USEPA studies. Appreciable bioconcentration might only be expected, if aquatic organisms were exposed over long periods of time to the higher concentrations of perchloreothylene that was detected in the groundwater on-site.

SECTION 4: ENFORCEMENT STATUS

The Potential Responsible Parties (PRP) for the site include:

(1) Roxy United Cleaners, Inc.
(2) Mardigian Properties, Inc.

The PRPs indicated a financial inability to implement the RI/FS at the site when requested by the NYSDEC. The PRPs have been contacted to assume responsibility for the remedial program and to implement the remedy. If an agreement cannot be reached with the PRPs, the remedial program will be implemented using State Superfund and/or Federal Superfund if the site qualifies for the National Priority List. The PRPs are subject to legal actions by the State for recovery of all response costs that the State has incurred. The State also plans to recommend the Roxy Cleaners site to the United States Environmental Protection Agency for the National Priority List. Placement on the National Priority List would qualify the site for Federal funding for remediation.

SECTION 5: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6NYCRR 375-1.10. These goals are established under the guideline of meeting all standards, criteria, and guidance (SCGs) and protecting human health and the environment.

At a minimum, the remedial action 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 primary cleanup goals for the Roxy Cleaners Site are:

- Protect human health and the environment by reducing the contaminant mass in the aquifers on-site and off-site.
- Provide drinking water that is completely safe for human consumption and use.
- Prevent human exposure to contaminated soil gas volatilizing off the contaminant plume in the overburden aquifer.
- Reduce migration of soil contaminants from the vadose zone (unsaturated soils) of the contaminated soils on-site into the groundwater. (Completed in 1992 as an Interim Remedial Measure).
- Prevent human and environmental exposure to contaminated groundwater. More specifically, prevent further migration

of the plume:

(1) to additional private water supplies, and

(2) to the Wynantskill Creek.

If feasible, the secondary goal for groundwater remediation is to:

- Protect human health and the environment by restoring the aquifers to comply with State standards and guidelines for groundwater, if feasible. Specifically, standards are 5 parts per billion for perchloreothylene, trichloroethylene and dichloroethylene, both in groundwater and in drinking water. Achievement of this goal would be dependent on the effectiveness of the selected alternative as determined by the monitoring program that would be implemented at the site.

SECTION 6: SUMMARY OF THE EVALUATION OF REMEDIAL ALTERNATIVES

Potential remedial alternatives for the Roxy Cleaners Site were identified, screened and evaluated in a three phase Feasibility Study. This evaluation is presented in the report entitled Roxy Cleaners Site, Phase I, II & III Feasibility Study Report, July 1993. A summary of the detailed analysis follows.

Two groups of remedial alternatives were evaluated to fulfill the remedial goals for the site. The first group that was evaluated, is described in subsection 6.1, and consists of three alternatives for remediating contaminated groundwater. The second group, is described in Section 6.3 consists of two alternatives for remediating the private water supply.

Subsection 6.1: Description of The Remedial Alternatives for Contaminated Groundwater

The three alternatives for remediating contaminated groundwater which received a detailed evaluation and comparison in the feasibility study are:

(1) GW-1: No Further Action
(2) GW-2: Extraction of On-site Overburden and Bedrock Aquifer/Air Stripping with Vapor-Phase Activated Carbon (VPACF) Treatment/Discharge to Surface Water
(3) GW-3: Extraction of On-site Overburden and Bedrock Aquifers Coupled with Extraction of Off-site Overburden

Aquifer Extraction/Air Stripping with Vapor-Phase Activated Carbon Adsorption/Discharge to Surface Water.

Alternative GW-1: No Further Action

Total Capitalized Costs:	$ 197,400
Captial Cost:	$ 52,100
Annual Operation & Maintenance	$ 9,450
Present Worth of 30 years of Operation & Maintenance:	$ 145,300

Time to meet Standards, Guidance and Criteria: 80+ years.

The "No Further Action Alternative" is included here because it is required as a basis for comparison. This alternative takes into account the on-site source remediation completed by vacuum extraction in November, 1992.

No Further Action for the groundwater at the Roxy Cleaners site would consist of a long-term monitoring program. There would be no attempt to collect or control the migration of contaminated groundwater. This alternative is estimated to leave several thousand pounds of contaminant mass in the groundwater. Long-term monitoring would be implemented in order to assess the attenuation and migration of the contaminated groundwater. The monitoring programs would include an annual inspection of the site as well as sampling and testing of the groundwater at approximately 15 points every six months. A combination of both overburden and bedrock wells would be monitored. In addition, being that this alternative would result in contaminants remaining on-site, the site would be reviewed periodically.

Alternative GW-2: Extraction of On-site Overburden and Bedrock Aquifer/Air Stripping with Vapor-Phase Activated Carbon (VPACF) Treatment/Discharge to Surface Water

Total Capitalized Cost:	$ 826,900
Capital Cost:	$ 382,600
Annual Operation & Maintenance	$ 28,900
Present Worth of 30 years of Operation & Maintenance	$ 444,300

Time to meet Standards, Guidance and Criteria:
On Site Groundwater: 20-45 years
Off Site Groundwater: 80+ years

The major features of this alternative include: (1) installing on-site bedrock and overburden extraction wells, (2) groundwater pumping of the aquifers in the on-site overburden and bedrock aquifers, at an estimated rate of 15 gallons per minute, (3) collection and air stripping of VOCs with vapor-phase activated carbon off-gas treatment; (4) discharge to surface water; and (5) a performance monitoring program which document contaminant removals by the groundwater treatment system.

The influent to the treatment system would be pre-treated as necessary. The need and type of pretreatment would be evaluated and determined during the design. Following any pre-treatment, the water would be treated using air stripping for the removal of VOCs. This treatment would reduce the volatile organic contaminants (i.e., PCE, TCE, and DCE) to the target cleanup levels required by the State. The water would then be discharged into the Wynantskill Creek. Any potential flooding or erosion which may be created by this discharge would be evaluated and mitigated in the discharge system design.

Perchlorethylene is classified as a moderately toxic air contaminant; and its ambient guideline concentration (AGC) is .075 ug/m_3. Based on preliminary calculations, the air emissions from the air stripper would exceed the AGC for perchloroethylene. Therefore, carbon adsorption system would be necessary to capture the contaminants from the air phase.

A vapor-phase activated carbon unit would be installed to treat the air stripper gases. VOC emissions out of the vapor treatment unit, would be monitored in order to document compliance with NYS ambient guideline concentrations.

Alternative GW-3: Extraction of On-site Overburden and Bedrock Aquifers Coupled with Extraction of Off-site Overburden Aquifer/Air Stripping with Vapor-Phase Activated Carbon Adsorption/Discharge to Surface Water

Total Capitalized Costs:	$ 1,300,000
Capital Cost:	$ 606,200
Annual Operation & Maintenance	$ 45,100
Present Worth of 30 years of Operation & Maintenance	$ 693,800

Time to meet Standards, Guidance and Criteria:
On Site Groundwater: 20-45 years
Off Site Groundwater: 36 + years

The major features of this alternative include: (1) installing on-site bedrock and overburden extraction wells, (2) installing overburden extraction wells off-site (3) groundwater pumping of the aquifers in the on-site overburden and bedrock, and off-site

overburden at an estimated combined rate of 25 gallons per minute, (4) collection and air stripping of VOCs with vapor-phase activated carbon off-gas treatment; (5) discharge to surface water; and (6) a performance monitoring program. The treatment system, discharge and treatment monitoring system are identical to those described in Alternative GW-2.

Subsection 6.2:
Evaluation of the Remedial Alternatives for Contaminated Groundwater

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 criteria and comparative analysis is contained in the Feasibility Study.

The first two evaluation criteria are termed threshold criteria and must be satisfied by the selected remedy.

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.

Alternative GW-1, No Further Action, would leave contaminated groundwater in place; GW-1 would not satisfy the contaminant specific SCGs in the short-term, possibly requiring an SCG Waiver. However, since the on-site soil source has been remediated, natural attenuation may remediate the groundwater over a very long time period (more than 80 years).

GW-2 would actively remediate the on site groundwater. The RI/FS estimated that approximately 310 lbs. of contaminants would be removed during the first year of remediation.

If implemented over a period of 20-45 years, Alternative GW-2 would reduce levels of the chemicals of concerns in the aquifers on-site to concentrations below the State SCGs. However, GW-2 would not actively remediate the part of the plume that has already migrated off-site. An "SCG Waiver" may be required for the short-term. Again, natural attenuation would remediate the off-site plume over the long-term (more than 80 years).

Alternative GW-3 would reduce concentrations of the chemicals of concern below state SCGs sooner than would GW-1 or GW-2.

Alternative GW-3 would remediate the on-site overburden and bedrock aquifer in 20-45 years and the off site overburden aquifer in 36+ years.

Both GW-2 and GW-3 would serve to remove contaminants from the aquifer as a source control measure. Short-term operation of one of the pump and treat options would reduce the mass and concentration of contamination in the groundwater without fully attaining SCGs.

In addition, reduction in the contaminant levels will result in a reduction in the amount of contaminated soil gas generated.

Estimates of time to achieve SCGs are based on models and empirical calculations. The time to achieve these very low SCGs may vary. The length of operation of the remedy will be determined by its measured effectiveness and from the monitoring plan that will be conducted concurrently. Data from the monitoring will determine the feasibility of meeting SCGs, the length of time necessary to operate the system, and to determine if the remedy will only achieve the primary goals of reducing the contaminant loading, reducing the migration of contamination and reducing the amount of contaminated soil gas.

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.**

Alternative GW-1, No Further Action, would result in the gradual dilution and reduction of the site-related plume. The concentration of contaminants in the groundwater on site would decrease very slowly. The gradual restoration of site groundwater would reduce the potential risk of contaminated groundwater/drinking water only in the distant future (at least 80 years). GW-1, however, would not prevent the outer extremities of the plume from migrating to new properties or the Wynantskill Creek.

Alternative GW-2 would minimize further off-site migration of the plume in both aquifers. Remediation of the groundwater would reduce the amount of contaminated soil gas generated. This in turn would reduce the potential health risks associated with the higher concentrations of contaminated soil gas in buildings with susceptible construction located in the area of contaminated soil gas. GW-2 however may not be a reliable deterrent to further migration of the extremities of the plume to other private wells.

Alternative GW-3 provides the greatest reduction of the potential

risks associated with the groundwater plume. The contaminant mass in the on site groundwater would be reduced as would occur in GW-2. As in alternative GW-2, the reduction in groundwater contamination would reduce the amount of contaminated soil gas and its attributable risks. In addition, mass reductions in the off-site overburden aquifer would also occur; they have been estimated at 40 pounds during the first year of operation. Further, migration of the off-site overburden plume would be reduced by interception of the groundwater by an extraction well located at the downgradient edge of the plume.

Substantial benefits of protecting health and the environment could be expected from both GW-2 and GW-3, in that the mass and concentration of contamination in groundwater, and a reduction in the vaporization of contaminants into the soil gas near the site would occur. In addition, GW-3 would provide a substantial benefit in controlling migration of contamination in the overburden aquifer.

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

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

Alternative GW-1, No Further Action, would not actively remediate the groundwater, but would permit naturally occurring processes to restore site groundwater over the long-term. There is only limited construction involved in the implementation of this alternative, the installation of additional monitoring wells. Minor risks to on-site workers might present themselves during the drilling and monitoring. However, potential risks would be mitigated using personal protection equipment and adhering to proper health and safety protocols.

Alternative GW-2 would actively remediate the on-site aquifers. There is on-site construction involved in the implementation of this alternative. However, it might only present minor short-term risks to adjacent properties. Construction safeguards would be put in place to minimize all risks. Minor risks to on-site workers might present themselves during the implementation of this alternative; however, these would be mitigated using personal protection equipment, construction safeguards and adhering to proper health and safety protocols. In addition, on-

site contaminant emissions from the air stripper would be controlled by a vapor phase GAC treatment.

GW-2 would not have any adverse environmental impacts. The small discharge of the treated effluent to the Wynantskill Creek is not expected to have any short-term impacts due to the increase in flow rate (e.g., erosion). However, the system design would consider erosion and flooding, and mitigate any potential impacts of the discharge on the stream.

Alternative GW-3 provides for the on-site contaminant source control and interception of the off-site plume. It will reduce the future potential risks to human health and the environment. On-site and off-site construction would present only minor short-term risks to adjacent properties from dust emissions. In addition, construction safeguards would be put in place to minimize all of these minor risks. Minor risks to on-site/off-site workers may present themselves during the implementation of this alternative. However, these would be mitigated using personal protection equipment, construction safeguards and adhering to proper health and safety protocols.

4. <u>Long-term Effectiveness and Permanence.</u> This criterion evaluates the long-term effectiveness of alternatives after implementation of the response actions. 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.

In GW-1, only natural attenuation could reduce contaminant mass and concentration levels after a period of many years. Appendix A of the Feasibility Study estimates that remediation of the aquifers by natural attenuation would require in excess of 80 years. Over time however, contamination may also migrate further from the site and may contaminate more private wells. It is also possible that the plume may eventually impact surface water quality in the Wynantskill and would result in continuing long-term soil gas problems near the site. Long term monitoring would be an important activity of GW-1.

In GW-2, the concentration of contaminants in the on-site groundwater (i.e., PCE, TCE, DCE) would be reduced and would allow the aquifers to meet the State target cleanup level of 5 ppb sooner than the No Action Alternative. All potential risks associated with the on-site aquifer would be reduced upon successful implementation of this alternative.

While this alternative would implement an active pump and treat system on the on-site plume, the system would not actively remediate the off-site aquifers. Only natural attenuation would remediate the contaminants in the off-site overburden aquifer. Discharge of the treated groundwater to the Wynantskill Creek would not have any permanent long-term, adverse impacts. Contaminant emissions would be controlled by vapor phase GAC treatment.

GW-2 would provide further source control and help minimize further migration of contaminants from the site in groundwater and reduce the contaminant levels in soil gas. Appendix A of the Feasibility Study estimates that the plume on-site would meet State standards within 20-45 years as a result of implementing GW-2.

The concentration of contaminants in the on-site groundwater (both the overburden and bedrock) and in the off-site overburden aquifer would be reduced and would allow the aquifers to more rapidly meet target cleanup levels of 5 ppb in GW-3 in comparison to GW-1 or GW-2.

GW-3 would actively control further migration and reduce contaminant concentrations in soil gas. In addition to remediating on-site groundwater in 20-45 years, the Feasibility Study estimates that GW-3 would remediate the off-site plume in 36 or more years.

Monitoring of the discharge system would also be necessary to ensure that the system is operating optimally. However, discharge to the Wynantkill Creek would not be expected to have permanent or long-term adverse impacts.

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

In GW-1, long-term natural self-purification processes would reduce the contaminant levels in site groundwater. In the distant future, therefore, this alternative would result in a gradual reduction of the concentration of contaminants in the groundwater. Natural attenuation would gradually reduce the volume of site groundwater exceeding the SCGs. This alternative would not reduce contaminant mobility in groundwater.

GW-2 would significantly reduce the amount of contamination in the on-site aquifers by more rapidly reducing the contaminant concentrations and mass of contaminants adhering to the saturated soil. This alternative would not remediate the groundwater in

the off-site overburden aquifer. However, there should be a reduction in contaminant concentration of the groundwater in the off-site aquifer over time due to natural attenuation. Page 24 of Appendix A of the Feasibility Study Report estimated the performance of a pump and treat system for the on-site plume. In the first year of operation, Alternative GW-2 would capture 310 pounds of contaminants.

GW-3, would significantly reduce the amount of contamination of the groundwater in the on-site overburden and bedrock aquifers and off-site overburden aquifer. The mass of contamination in both on-site aquifers and the off-site overburden aquifer would decrease during remediation. The mobility of the contaminants, in both the on-site overburden and bedrock aquifers, would be minimized due to the combined source control and plume capturing actions. Page 25 of Appendix A of the Feasibility Study Report estimates that Alternative GW-3 would capture and recover an additional 40 pounds of contaminants from the leading edge of the off-site plume. Therefore, total capture in the first year of Alternative GW-3 is estimated at 350 pounds.

Both GW-2 and GW-3 would more rapidly reduce the concentrations of contaminants in the soil gas and groundwater. A reduction in the concentration of contaminants would reduce the potential risks associated with the toxicity of the chemical contaminants.

6. <u>Implementability</u>. The technical and administrative feasibility of implementing each alternative is evaluated. Technically, this includes the difficulties associated with the construction, the reliability of the technology, and the ability to monitor the effectiveness of the remedy. Administratively, the availability of the necessary personal and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc..

GW-1 would be easy to implement technically. The existing system of monitoring wells may be adequate for the monitoring program. Necessary services and materials are readily available and effective. GW-1 would require considerable long-term institutional management of the annual sampling and inspections. Both GW-2 or GW-3 utilize technologies that are proven and commercially available. GW-2 or GW-3 both require administrative approval for discharge of treated groundwater to the Wynantskill Creek. Applicable standards and regulations must be met, although an actual permit to discharge would not be necessary.

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 No. 5 and Table No. 6.

Alternative GW-1 has a relatively low cost, but would not achieve the goals of preventing migration of the contaminant plume, reducing potential exposure to contaminated soil gas and reducing the contaminant loading in the groundwater in the short term. Both GW-2 and GW-3 would achieve these goals. However, operation of the pump and treat system may not be warranted for 30 years to achieve SCGs. The length of operation of the remedy and feasibility of meeting SCGs in a cost effective manner would be determined from monitoring data collected during remediation.

The final criterion is considered a modifying criterion and is taken into account after evaluating those above.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan are evaluated. A "Responsiveness Summary" has been prepared that describes public comments received and how the Department will address the concerns raised.

Subsection 6.3:
Description of the Remedial Alternatives for Private Water Supply

The two alternatives for the public water supply which received a detailed evaluation and comparison in the Feasibility Study are: (1) PW-1: No Further Action, and (2) PW-2: Connection to Public Water Supply

Alternative PW-1: No Further Action

Total Capitalized Cost:	$ 1,048,700
Capital Cost:	$ 516,000
Annual Operation & Maintenance (O&M)	$ 34,700
Present Worth of 30 years of Operation & Maintenance	$ 532,700
Time to Implement:	Immediately

The major features of this alternative include continuing the

existing program which maintains granular activated carbon treatment systems on 19 individual private wells impacted by the groundwater contamination. This proposed alternative would continue to maintain and monitor the point of use carbon adsorption treatment systems currently in operation.

This alternative would also monitor any further migration of site contaminated groundwater, and provide point of use carbon adsorption treatment units for future identified receptors. Taking a conservative approach, it was assumed that during the entire period of the remedial action, an additional 20 private wells would require treatment systems installed over the course of this alternative. This alternative, therefore would also provide maintenance and monitoring of these proposed 20 future systems. A monitoring program would be used to track the migration of contaminants to any other wells at risk of future contamination from the site.

In any case, monitoring and maintenance of the filters and monitoring of other wells at risk would need to continue until groundwater was restored to meet drinking water standards. The time frame for this to occur was estimated at between 20-80 years depending on the alternative selected.

Alternative PW-2: Connection to Public Water Supply

Total Capital Costs: $ 643,500

Annual Operation & Maintenance (O&M) N/A

Time to Complete: One year after the formation of a water district. (It is estimated to take 1-2 years to form Water District and design the extension).

Alternative PW-2 would involve extending the existing Troy public water supply system to service the affected private wells in Wynantskill. The public water supply nearest the site is located in the City of Troy. A 12-inch water main in Pawling Avenue terminates at the City line adjacent to the Town of Brunswick, approximately 5,400 feet west of this site. The water main is within the City of Troy Water district, and is fed from the Upper High Service Tank located on Tibbets Avenue. Discussion with personnel from the Troy Public Utilities Department indicates that adequate water pressure would allow the extension of the Troy Water Supply service to the site area. Existing pressure would need to be verified prior to performing a detailed engineering design.

Connection of the 19 affected properties to the existing main is feasible. In addition, the system would be designed to connect those homes and businesses with wells that would be at risk of contamination in the future. It is possible that over the course of remediating the groundwater, additional properties may be impacted by the contaminated groundwater from the site. This likelihood was assumed in order to calculate the cost of PW-2.

Alternative PW-2 includes installation of the water main extension east along Route 66 to the residents affected or potentially affected by the Roxy Cleaners site. PW-2 also includes installation of waterlines in Main Avenue, Dodge, Ashcroft and Bellemead Streets, Orchard Terrance, and Lenox Avenue. Individual domestic water supply connections would be made to each of the affected and potentially-affected properties.

Extension of the water main will require creation of a new water district. The actual establishment of a water district must be decided by property owners. However, based on correspondence from the Town of North Greenbush, town officials are willing to assist the involved property owners in establishing the new district. The new water district must assume the responsibility for operation and maintenance of the water line. For its part, the State will continue to monitor and maintain the individual carbon filter units until the waterline system is in place (1-3 years).

Subsection 6.4:
Evaluation of the Remedial Alternatives for Public Water Supply

Eight criteria were also used to evaluate private water supply alternatives, PW-1 and PW-2:

1. **Overall Protection of Human Health and the Environment**. Both Alternative PW-1 and PW-2 would provide effective protection to local residents whose wells have been or may be contaminated by the plume from Roxy Cleaners Site. However, the filter systems in PW-1 would need to be monitored and maintained regularly in order to be as protective as PW-2, connection to the public water supply.

2. **Compliance with SCGs/TBCs**. Both alternatives would provide safe drinking water to effected properties that complies with standards for public drinking water.

3. **Short-term Effectiveness**. PW-1 would be effective immediately. PW-2 could be fully constructed within one year after a Water District is formed. PW-2 would not require the ongoing monitoring program that PW-1 would require. Some short term exposures of workers to contaminated materials may occur

during construction of the water lines in some areas near the site. The use of personnel protection equipment, construction safeguards and adhering to proper health and safety protocols would minimize these risks. Monitoring of any potential releases of contamination during construction would protect the public.

4. **Long-Term Effectiveness and Permanence.** Again, the point of use systems in PW-1 would be subject to failure without ongoing monitoring and maintenance. PW-2, the waterline, would require minimal maintenance and would provide water from an approved and reliable public water supply to the area. In addition, if all properties at risk from future migration are connected at the outset, PW-2 would eliminate the need for neighborhood monitoring presently being performed semi-annually by DOH.

5. **Reduction of Toxicity, Mobility and Volume.** PW-1 would remove the toxicity from contaminated drinking water at the point of use. PW-2 would not treat the water in individual wells, and would do nothing to reduce contaminant mobility.

6. **Implementability.** All the required technologies required in PW-1 are technically feasible and commercially available. PW-1 would require the cooperation of local residents. The proximity of the existing water main makes PW-2 relatively cheap and easy to implement. Administratively, PW-2 would require the agreement and cooperation of local residents.

7. **Cost.** The total capital costs for PW-1 is $516,000 compared with $643,500 for PW-2. However, PW-1 requires $34,700 per year for operations and maintenance (O&M); while PW-2 has very minimal O&M costs which would be borne by a water district.

8. **Community Acceptance.** Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan were evaluated. A "Responsiveness Summary" has been prepared that describes public comments received and how the Department will address the concerns raised. The selected remedy does not differ significantly from the proposed remedy.

SECTION 7: SUMMARY OF THE GOVERNMENT DECISION FOR THE SELECTED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC has selected the following as the remedy for the site:

1. Groundwater Remedial Alternative

   GW-3: Extraction of On-site Overburden and Bedrock Aquifers Coupled with Extraction of Off-Site Overburden Aquifer/Air Stripping with Vapor-Phase Activated Carbon Adsorption/Discharge to Surface Water

2. Private Water Supply Alternative

   PW-2: Connection to Public Water Supply

Subsection 7.1:
Rationale for Selection of Groundwater Remedial Alternative

Alternative GW-1, No Further Action, would have relied solely on natural attenuation processes for remediating the groundwater. This remediation alternative would have been totally passive. Alternatives GW-2 and GW-3 incorporated an aquifer extraction and treatment system. Alternative GW-2 would have provided for the remediation of on-site overburden and bedrock aquifers. However in this alternative the off-site overburden aquifer would have been allowed to remediate via natural attenuation process. This alternative was partly passive and partly active. The selected alternative, GW-3, will provide more active groundwater remediation for the on-site overburden and bedrock aquifers, and off-site overburden aquifer. All three groundwater alternatives included monitoring to track off-site contaminant migration.

GW-3 will provide for the most rapid active reduction in contaminant levels in the groundwater. GW-3 will also provide for the active control of future migration of the groundwater contamination to currently unaffected areas. In addition, reduction in the concentrations of contaminants in the overburden aquifer will reduce the concentration of contaminants in soil gas.

In terms of compliance with SCGs, present data indicates that NYS Standards for volatile organic compounds (i.e., PCE, TCE and DCE) are currently exceeded. GW-3 will remediate groundwater to meet SCGs sooner than would GW-1 or GW-2. However, monitoring data will determine if it will be cost effective to meet SCGs in addition to meeting the primary goals of reducing the contaminant loading, reducing migration of contaminated groundwater and reducing the potential risks associated with contaminated soil gas.

The selected Alternative GW-3 is expected to attain faster groundwater remediation both by source control and plume capturing actions than the other remediation alternatives. Risks associated with construction and operation of the remedy will be controllable by proper construction and safety techniques, and by treatment of the off-gases from the air stripper. In addition, the cost of GW-2 and GW-3 are relatively close. Therefore, the alternative selected for treating the contaminated groundwater is Alternative GW-3.

Subsection 7.2
Rationale for Selection of Private Water Supply Remedial Alternative

The two alternatives for the Private Water Supply differ in that PW-1 would provide point of use treatment systems for currently identified human receptors and for future impacted receptors,

while the selected alternative, PW-2, will provide public water to all currently identified human receptors and future impacted receptors. In the general area of groundwater contamination, providing a public water supply to the affected area is a more reliable, long term solution to the private water supply contamination problem. It is also more effective over a long term.

Subsection 7.3:
Cost of Selected Remedy

The total capitalized cost over 30 years to implement the groundwater remedy GW-3 is $1,300,000. The cost to construct the remedy is estimated to be $606,200 and the estimated average annual operation and maintenance cost is $ 45,100.

The total cost to implement the private water supply remedy, PW-2, is $643,500. Of that, $574,100 is for construction of the water line and $65,400 is for two years of individual filter maintenance. Annual operation and maintenance costs of the new water system will be borne by a local Water District.

The total estimated capitalized cost to implement the total remedy (GW-3 and PW-2) is $1,943,500 of which $1,250,00 are the construction costs. See Table No. 5 and Table No. 6.

As stated in Section 4: Enforcement Status, prior to construction of the remedy, the PRPs will be approached to assume responsibility for the remedial program. If agreement is not reached, the NYSDEC will implement the remedy using State and/or Federal funding. This action will not preclude legal actions by the State and/or Federal Government for recovery of response costs from the PRPs.

Subsection 7.4:
Elements of the Selected Remedy

The elements of the selected remedy for groundwater remediation, Alternative GW-3, will include:

1. 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. Uncertainties identified during the RI/FS will be resolved.

2. A groundwater extraction system consisting of three (3) pumping wells extracting a total of 25 gallons per minute will be installed. Since the wells are expected to operate

TABLE NO. 5
COST COMPARISON OF ALTERNATIVES FOR GROUNDWATER (GW) REMEDIATION AT THE ROXY CLEANERS SITE

Cost	Alternative GW-1 No further Action	Alternative GW-2 Extraction of On-Site Overburden and Bedrock Aquifers/Air Stripping with with Vapor Phase Activated Carbon/ Discharge to Surface Water	Alternative GW-3 Extraction of On-Site Overburden and Bedrock Aquifers Coupled with Off-site Overburden Aquifer/Air Stripper with Gas Vapor Phase Activated Carbon/Discharge to Surface Water
• Capital Cost	$ 52,100	$ 383,600	$ 606,200
• O&M	$ 9,450	$ 28,900	$ 45,100
Total Capitalized	$ 197,000	$ 826,900	$ 1,300,000

TABLE NO. 6
COST COMPARISON ALTERNATIVES FOR PRIVATE DRINKING WATER REMEDIATION AT THE ROXY CLEANERS SITE

Cost	Alternative PW-1 No Further Action	Alternative PW-2 Connection to of Public Water Supply
• Capital Cost	$ 516,000	$ 643,500
• O&M (per year)	$ 34,700	N/A
• Total Capitalized Cost	$ 1,048,700	$ 643,500

continuously, this means 13.1 million gallons of groundwater will be treated per year.

Two of the extraction wells will be constructed at the plume source, the bedrock and overburden aquifer on-site, and will together recover 15 gallons per minute. It is expected that this pumping rate will exert hydraulic source control.

The third extraction well will be installed in the overburden 1000 feet west of the site in the vicinity of the intersection of Dodge Street with Main Avenue. This well will extract 10 gallons per minute and be piped back to the Roxy site to be treated. This third well will act to intercept the plume in the overburden aquifer. The primary goals of operating this system will be to reduce the mass and concentration of contaminants in the groundwater, to reduce the vaporization of contaminants into the soil gas, and to control the migration of groundwater contamination. Operation of the system to meet SCGs will be a secondary goal.

3. The collected groundwater will be treated by air stripping of the volatile chemical contaminants prior to discharge to the Wynantskill Creek. Pretreatment preceding the air stripper will be provided as needed.

   The air stripper will volatilize the contaminants in solution by passing 300 cubic feet per minute of forced air through the inflowing groundwater. Vapor emissions will be treated by a vapor phase carbon adsorption system. Although the discharge rate should not impact the stream, any potential concerns, such as flooding or erosion, will be addressed in the system design.

The elements of the selected remedy for contaminated private water supplies, alternative PW-2, will include:

1. Formation of a Water District by the local residents of Wynantskill to serve the site impacted area. The Water District will be responsible for reaching an agreement with the Troy Water Supply for the purchase of water, for obtaining right of ways/access, and for assuming ownership, operation and maintenance of the constructed water system. The Water District may have other responsibilities related to the implementation of the remedy depending on the source of funding and the size of the Water District.

2. A waterline sized to serve the impacted area only would be extended from the City of Troy along Route 66 and Main Street to the Roxy Cleaners site. Waterlines

will also be installed in Dodge, Ashcroft and Bellemead Streets, Orchard Terrace and Lenox Avenue. The nineteen properties with contaminated wells and those properties with wells that are located in the path of the plume of groundwater contamination (and that are reasonably threatened to become contaminated) will be connected to the water lines. These facilities will be funded by the responsible party and/or State or Federal Superfund. The cost of additional or larger capacity water system appurtenances or further extension of the water system beyond the affected area will be the responsibility of the local Water District.

3. Granular Activated Carbon Filters will be monitored and maintained on private water supplies contaminated with site related contaminants above drinking water guidelines. Other private wells will be monitored until the water system is installed.

4. A review of the water supply remedy will be made in three years regarding its implementability. If a Water District is not formed, or an agreement to purchase water from Troy is not reached, or other reasons preventing implementation of PW-2 exist, the Record of Decision will be reopened for the water supply portion of the remedy.

SECTION 8: HIGHLIGHTS OF COMMUNITY PARTICIPATION

The NYSDEC relies on public input to ensure that the remedies selected for this site meet the needs and concerns of the community and that the remedies are an effective solution to the problem.

As part of the RI/FS, a Citizen Participation Plan was prepared in September 1991. The principal objectives of the Citizen Participation Plan were:

1. To provide area residents with an understanding of the New York State Superfund process. Such an understanding promotes realistic public expectations about the activities, complexities and time involved with site investigation.

2. To provide accurate, understandable information concerning the RI/FS program to interested citizens. NYSDEC provided information through project updates and public meetings.

3. To provide the community with information needed to express their views and to discuss issues of concern with NYSDEC during the RI/FS process. Documents and data were made available for public review. Citizens and town officials were asked to express their views and discuss issues of concern with NYSDEC.

4. To establish a good relationship with the local media so that accurate information about RI/FS activities would be reported.

The following public participation activities were carried out:

1. Document repositories were established at the North Greenbush Town Library and the North Greenbush Town Clerk's Office. Pertinent reports and documents related to the RI/FS have been placed there during the project.

2. Three public meetings were held at the North Greenbush Court Room. The first two meetings were information sessions (November 1991 and November 1992) to discuss the findings and conclusions of the RI/FS and the IRM and to present information on the remedial alternatives being evaluated for the site.

3. The third public meeting was held on January 5, 1994. Its purpose was to solicit public comment on NYSDEC's proposed remedial alternative. Questions and answers recorded during this meeting and during the 30 day public comment period (December 17, 1993 to January 21, 1994) were used to develop the Responsiveness Summary, presented in Appendix B of this document.

Based on the information received during this process, there has been no significant change in the selected remedy for this site relative to the proposed remedy presented at the January 5, 1994 public meeting.

APPENDIX A

ADMINISTRATIVE RECORD INDEX

Appendix A

Roxy Cleaners Site
(#4-42-024)

Town of North Greenbush,
Rensselaer County, New York

Administrative Record Index

The following documents are included in the Administrative Record:

1. Phase I and II Hydrogeologic Investigation, Roxy Cleaners, Spill No. 89-01208, Empire Soils Investigation, Inc., July, 1990

2. Remedial Investigation and Feasibility Study - Volume I: Project Management Work Plan, October, 1991 Metcalf & Eddy

3. Volume II: Quality Assurance Project Plan, October, 1991, Metcalf & Eddy

4. Volume III: Health & Safety Plan, Dated September 1991

5. Remedial Investigation and Feasibility Study Phase I RI Data Report, April, 1992 Metcalf & Eddy

6. First Phase Remedial Investigation Validated Data November 1991 - February, 1992 (Approximately 400 pages)

7. Remedial Investigation and Feasibility Study Phase I Remedial Investigation Report Volume I, November 1992, Metcalf & Eddy

8. Remedial Investigation and Feasibility Study Phase I Remedial Investigation Report Volume II, - Appendices, November 1992, Metcalf & Eddy

9. Phase I, II, & III Feasibility Study Report, July 1993, Metcalf & Eddy

10. Roxy Cleaners Vacuum Extraction Final Project Report, July 1993.

11. Citizen Participation Plan, November, 1991, Roxy Cleaners Site No. 4-42-024, NYSDEC

12. Fact Sheet, Roxy Cleaners Site, Inactive Hazardous Waste Site No. 4-42-024, November 1991, NYSDEC

13. Fact Sheet Roxy Cleaners Inactive Hazardous Waste Site, No. 4-42-024, November 20, 1992, NYSDEC

14. Fact Sheet concerning the Proposed Remedial Action Plan, Roxy Cleaners Site, December, 1993, NYSDEC

Appendix B

Responsiveness Summary

Appendix B

Roxy Cleaners Site
(#4-42-024)

Town of North Greenbush,
Rensselaer County, New York

Responsiveness Summary

This Responsiveness Summary was prepared in order to respond to the public's comments about the New York State Department of Environmental Conservation's (NYSDEC's) Proposed Remedial Action Plan (PRAP) to remediate contaminated groundwater and contaminated private water supplies by the Roxy Cleaners Site.

NYSDEC invited the public to comment about the proposal through a mailing to the site's contact list and at a public meeting held on January 5, 1994. This Responsiveness Summary addresses public comments received at that meeting and during the public comment period which ran from December 17, 1993 until January 21, 1994.

* * * * *

I. **Endorsements**

1. Endorsement:

Several residents at the public meeting spoke in favor of the remedy, most particularly for the extension of the water supply line. A number of Wynantskill property owners also telephoned to express their enthusiastic support for a public water system.

2. Endorsement:

The Town Board of North Greenbush endorsed the two recommended actions proposed by the NYSDOH and NYSDEC for the Roxy Cleaners Site. The Board expressed its willingness to assist in the formation of a water district to serve the affected properties. (A resolution was passed by the Board at their meeting on January 13, 1994. It is included at the end of the Responsiveness Summary).

3. Endorsement:

The three County Legislators representing districts within the Town of North Greenbush also endorsed the proposed remedial plan for the Roxy Cleaners Site. The legislators felt it was essential both to (a) provide municipal water to the affected properties, and (b) to remediate contaminated groundwater with a pump and treat system. (Letter included in Responsiveness Summary).

4. Endorsement:

The Rensselaer County Environmental Management Council also endorsed the proposed remedial action plan as the most prudent and expeditious approach. The council commended the diligence demonstrated by NYSDEC and NYSDOH in the citizen participation activities for the Roxy Cleaners Site. The EMC will continue its interest and involvement during the design and implementation of the groundwater remediation system. (Letter included in Responsiveness Summary).

II. **Comment Letter from Potential Responsible Party**

Comments on the Proposed Remedial Action Plan (PRAP) were also received from the attorney representing the current President of Roxy Cleaners, Inc. The content of the letter (included at end of the Responsiveness Summary) can be summarized by the following points:

1. PRP Comment:

The President of Roxy Cleaners has been involved in the daily operation of the Wynantskill facility since 1981. He maintains that any chemical-handling practices or chemical spills (that contributed to the site-related contamination) occurred before 1981.

NYS Response:

No comment.

2. PRP Comment:

The letter emphasizes the company's responsive role in the immediate reporting of aquifer (groundwater) contamination in May, 1989.

NYS Response:

The State acknowledges the initial involvement of Roxy Cleaners in the site's discovery and remediation (see page 4 of the Record of Decision).

3. PRP Comment:

The letter contests the categorization of perchloroethylene and trichloroethylene as Class B Probable Human Carcinogens by the United States Environmental Protection Agency.

NYS Response:

The Potential Responsible Party is correct in that the US EPA cancer classification for these chemicals (formerly Group B2) is currently under review, and final cancer classifications for tetrachloroethene and trichloroethene have yet to be determined by USEPA. However, although it is not known whether tetrachloreothene and trichloroethene cause cancer in humans, the results from animals studies are sufficient to conclude that these chemicals are potential human carcinogens. For tetrachloreothene, the major contaminant of concern at the site, the International Agency for Research on Cancer and the United States Department of Health and Human Services have both determined that the animal evidence is sufficient to conclude that exposure to this chemical presents a carcinogenic risk to humans (IARC, 1987, US DHHS, 1991).

4. PRP Comment:

The letter questioned the State's conclusion that Roxy Cleaners was the only source of the site's groundwater contamination.

NYS Response:

Both NYSDEC and NYSDOH drew conclusions based on extensive data bases and testing around the site which confirmed the presence of a defined plume of dry cleaning related solvents. Also, an area of soil with high concentrations of perchloroethylene was found behind the Roxy Cleaners building and remediated by vacuum extraction.

5. PRP Comment:

The letter faults the PRAP document for not specifically disclosing the rate and direction of plume migration from the Roxy Cleaners Site, questioning the existence of any real risk of further migration of the contaminants into drinking water or indoor air.

NYS Response:

The supporting documentation for the PRAP (specifically Section 6 of the Remedial Investigation Report) provides an estimate of the rate and direction of continuing plume migration. Section six of the RI Report also states that

there is evidence of plume movement toward the creek. Also, since 1989, NYSDOH has documented that slowly advancing perchloroethylene migration has contaminated three (3) additional private wells.

6. PRP Comment:

The letter argues with the need for groundwater remediation at the site, giving two (2) points. Their first argument is that Interim Remedial Measures continue to alleviate all actual exposures to site contaminants in drinking water and in indoor air, and that potential future risks are not significant issues. Their second argument assumes the presence of perchloreothylene as a dense, non-aqueous phase liquid (DNAPL), which may not respond well to pump and treat remediation.

NYS Response:

Data collected during the Remedial Investigation established the potential health and environmental risks from contaminated groundwater and soil gas at the Roxy Cleaners Site. Even though IRMs presently prevent actual exposures from occurring, the Feasibility Study Report established that groundwater remediation by a pump and treat system was feasible.

In answer to the PRP's second argument, the RI did <u>not</u> establish the presence of perchloroethylene as a DNAPL. Information gathered in the future which might indicate limited effectiveness of the groundwater remedy will be used to modify the design or operation accordingly.

III. <u>Questions and Comments from the Public Meeting</u>

1. Question:

Are dry cleaners a problem throughout the State in causing similar contamination problems?

Response:

Yes. There are a number of dry cleaners in the Registry of Inactive Hazardous Waste Disposal Sites.

2. Questions:

The initial discovery of the Roxy Cleaners Site was in May of 1989; now the State is saying construction of the final remediation may not be completed until 1996. Why is it taking so long?

Response:

An extensive Remedial Investigation/Feasibility Study was necessary to determine and document the most appropriate final remedial for the Roxy Cleaners Site. However, in the interim period from May, 1989 to the present, as risks of contaminant exposures to the public health have been identified, they have been immediately corrected with "Interim Remedial Measures".

3. Question:

Will the State be able to recover the costs of the site remediation from the Potentially Responsible Parties (PRPs): Roxy Cleaners Inc. and Mardigian Properties, Inc.?

Response:

The State has contacted the PRPs to determine if the PRPs will take responsibility for implementing the selected remedy. If the PRPs are unable or unwilling to undertake the remedial work the State will implement the remedy. The State can then pursue a cost recovery action against the PRPs if the PRPs are financially viable.

4. Question:

Can anything prevent or block the waterline extension?

Response:

Yes. The waterline can only be extended if a local Water District is formed and the Water District reaches an agreement with the City of Troy Water Supply to sell water to the local Water District.

5. Question:

Will town growth and development be considered in the design of the public water system?

Response:

Under the State Superfund program, NYSDEC is only allowed to provide funding for the construction of the minimum water service minimally sized to provide drinking water to the area impacted (or which may reasonably be impacted by the Roxy Cleaners Site). Any additional water services beyond the minimum will have to be determined locally and funded by other means. For example, the locally established water district can expand the serviced area beyond the site-impacted properties or can expand the system in order to include fire protection.

6. Question:

When is the soonest the new water service may be completed?

Response:

At best, the 1995 construction season is the earliest anticipated completion period. Construction funding agreements and water district agreements may take more than a year to negotiate; and the design and construction of the waterline itself may take another year.

7. Question:

Will other homes, in addition to those with wells that are currently contaminated, be connected to the water system at no cost?

Response:

The selected remedy would provide funding to connect the currently impacted homes and those existing homes with wells within the contaminated plume area or in its path which are considered to be at risk. Other residents within the water district could connect to the system at their own expense. Future residential or commercial buildings built in the area of contamination would have to pay for their own connection to the water system.

8. Question:

Will there be additional testing of other private water supplies near the site since recent tests detected contamination in some wells that were previously uncontaminated and two other filter systems had to be installed?

Response:

Yes. The New York State Department of Health (NYSDOH) will continue testing private wells considered potentially at risk. Concerned residents should call the NYS Department of Health at (518) 458-6306 to discuss their concerns and to determine if testing of their wells is needed.

9. Question:

Will all properties within the water district have to abandon their wells and connect to the system?

Response:

The State does not have the legal power to force anyone to connect to the water system. The Water District however, may have rules governing connecting to the public water supply. All water districts require private wells to be physically disconnected from buildings served by public water supply.

10. Question:

Will the State Superfund monies pay for the periodic water bills for the property owners with contaminated wells?

Response:

No. The State Superfund will assume all the costs of connecting the individual properties to the water service, but the water bills will be the responsibility of the individual property owners. At present, the State maintains the carbon filters on the contaminated wells, but the property owners retain responsibility for maintaining and operating their wells.

11. Question:

Were other alternatives for groundwater remediation (besides groundwater pump and treat systems) examined for the Roxy Cleaners Site? Why not excavate all the contaminated soils in the plume area?

Response:

Other remedial alternatives were considered and evaluated. For example, one remedy that has been completed is cleaning up the contaminated soils behind and under the Roxy Cleaners building by a vacuum extraction remedy. A total of 356 lbs. of perchloroethylene was removed by this remedy from soils above the water table. Excavating all contaminated soils in the plume area would be very expensive and cost prohibitative. The implementation of the groundwater pump and treat remedy will gradually cleanup the groundwater and cleanse the soil beneath the water table as the chemicals leach out.

12. Question:

Could the aquifer clean itself by dissipation of the chemical perchloroethylene?

Response:

Yes. The chemical will dissipate over a very long time. The estimate for the perchloroethylene concentration to dissipate to within drinking water standards is more than 80

years. A pump and treat remedy will reduce the concentration of the chemical faster and will also reduce the production of contaminated soil gas.

13. Question:

Will the groundwater that is pumped and treated be discharged to the Wynantskill? Will flooding and erosion problems be of concern?

Response:

The small amount of treated water to be discharged is not likely to have a significant impact on the Wynantskill Creek. However, flooding and erosion will be considered in the system design in order to prevent any damage to the stream and neighboring properties by the discharge. Public comment will again be solicited during the detailed design of the system.

14. Question:

Will the groundwater pump and treat remedy operate 24 hours per day? Can it impact the yield of private wells?

Response:

The groundwater pump and treat system will operate 24 hours per day. It is not expected that the yield of private wells in the area would be affected at the pumping rate (25 gpm) that is planned for the system. Currently, a pump and treat system is in operation at the new Stewarts Shop across Main Avenue from Roxy Cleaners in Wynantskill.

Resolution Passed

By Town Board

of North Greenbush

January 13, 1994

1/. Enclosure

SEND to DEC.

At a regular meeting of the Town Board of the Town of North Greenbush held at 7:30 P.M. on January 13, 1994 at the Town Offices

- - - - - - - - - - - - - - - -

IN THE MATTER OF MAKING RECOMMENDATIONS TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION FOR REMEDIAL ACTIONS AT THE ROXY CLEANERS SITE

- - - - - - - - - - - - - - - -

WHEREAS, in 1989 contamination was discovered in drinking water and ground water at several properties in the Wynantskill section of the Town of North Greenbush (known by NYS DEC as the Roxy cleaners Site),and

WHEREAS, the New York State Department of Environmental Conservation (NYS DEC) has conducted a feasibility study and recommended remedial actions including extension of the public water supply line from the City of Troy and installing a ground water pump and treat system, and

WHEREAS, a public hearing was held on January 5, 1994 on the proposed actions, now therefore be it

RESOLVED, THAT THE Town Board of the Town of North Greenbush endorses the two recommended actions proposed by NYSDEC, and be it further

RESOLVED, that the Town Board urges DEC to include, within the area to receive public water, not only those properties already contaminated, but also surrounding properties which may develop contaminated drinking water if the plume spreads, and be it further

RESOLVED, that the Town Board recommends that the water line brought in from the City of Troy be 12" in diameter in order to accomodate all present and future users in the area, and be it further

RESOLVED, that the Town Board expresses its willingness to take the necessary steps to develop a new water district or expand an existing water district to serve the effected property owners, and be it further

RESOLVED, that the Town Board of the Town of North Greenbush urges NYS DEC to move as quickly as possible in the implementation of the recommended actions.

Councilman Flanigan moved, ~~Councilman~~ Supervisor WRight seconded and the Town Board voted as follows,

Supervisor Wright — Aye

Councilman Sunukjian — Aye

Councilman Flanigan — Aye

Councilman Dedrick — Aye

Councilman Spain — Aye

Letter From

Rensselaer County

Legislators

January 18, 1994

RENSSELAER COUNTY LEGISLATURE

January 18, 1994

Ms. Kathryn Eastman
NYSDEC Central Office
NYS Dept. of Environmental Conservation
Room 224
50 Wolfe Road
Albany, New York 12233-7010

Dear Ms. Eastman:

As County Legislators representing the Town of North Greenbush, we are most interested in endorsing the two recommended actions proposed by D.E.C. as regards the Roxy cleaners site.

Both ground water and drinking water are contaminated at this site. It is essential that residents in this affected area be provided with municipal water and that the contaminants be pumped out of the groundwater.

The North Greenbush Town Board conducted a public hearing on this issue on January 5, 1994. The consensus of the residents is that D.E.C. proceed with its proposals for correcting this situation. Additionally, the Town Board has expressed its willingness to develop a new water district and/or to expand the existing one.

We feel the health and safety of the residents in this affected area is of prime importance. For that reason, we urge D.E.C. to follow through on its recommended proposals to remediate this situation.

Sincerely,

Virginia O'Brien
County Legislator

Louis Polsinello, Jr.
County Legislator

William L. Dedrick
County Legislator

NED PATTISON
GOVERNMENT CENTER

TROY, NEW YORK 12180

PHONE (518) 270-2880

Letter From

Rensselaer County

Environmental

Management Council

January 18, 1994

Rensselaer County Environmental
Management Council
1600 Seventh Avenue
Troy, New York 12180
(518) 270-2888

Kathryn Eastman
Environmental Engineer 1
Bureau of Central Remediation Action
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233

Dear Ms. Eastman:

Enclosed for consideration in the Proposed Remedial Action Plan for Roxy Cleaners Site review are the comments on behalf of Rensselaer County Environmental Management Council.

Pursuant to your December 17, 1993 notice, these comments are being filed by January 21, 1994.

Thank you in advance for your attention to this submittal.

Sincerely,

Ken Dufty, Executive Director
Rensselaer County Environmental
Management Council.

Date: January 18, 1994

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ON

THE PROPOSED REMEDIAL ACTION PLAN FOR THE ROXY CLEANERS SITE

Town of North Greenbush

Rensselaer County, New York

SITE #4-42-024

January, 1994

I. INTRODUCTION

A. BACKGROUND

In the period between 1959 through 1988, Roxy United Cleaners (herein referred to as "Roxy") operated a dry-cleaning establishment near the intersection of Orchard Street, Main Avenue, and West Sand Lake Road in Wynantskill. The site is situated in the Town of North Greenbush and lies within the borders of Rensselaer County.

In 1984, an unreported spill of 55 gallons of perchloroethylene supposedly occurred outside the rear of the building. The facility ceased active dry cleaning in 1988, operating the establishment as a distribution center for Roxy Cleaners, Inc.

On May 3, 1989, Roxy notified DEC that at least one nearby private water well had reported contamination of perchloroethylene, a dry cleaning solvent. Note that there is no municipal water service to the area in question, and all residences and businesses are served by private wells. DEC immediately took samples of the water in question and found levels of perchloroethylene at levels 270 times the level considered safe. Other chemicals, trichloroethylene and dichloroethylene,[1] were found at levels exceeding safe drinking water guidelines.

Resultant studies and site analysis concluded that Roxy should install carbon filers on 16 private wells that had become contaminated from the spill. In November, 1989 Roxy notified DEC that it could no longer afford remediation costs, and the program was taken over by DEC.

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[1]. Herein, perchloroethylene, trichloroethylene, and dichloroethylene will be referred to as "cleaning solvents" unless otherwise specified.

In the period between July, 1989 through January 1989, DEC initiated and completed a hydrogeologic investigation of the Roxy site contamination.

In January, 1990 indoor air contamination was discovered in an adjacent industrial building. DEC oversaw installation of a ventilation system which alleviated the problem.

Pursuant to the State Superfund Program, DEC initiated a Remedial Investigation\Feasibility Study (RI\FS) in August 1990 to find a long-term solution to the contamination at the site. The study included; groundwater sampling, soil boring, drilling and installation of 25 monitoring wells, soil gas survey, mapping of the contamination, or "plume", and sampling of the adjacent Wynantskill Creek.

Based upon the findings and conclusions of the RI\FS, it was determined by DEC and DOH that remediation of the site and surrounding contaminated soils and water was required.

1) Health Risks

Perchloroethylene and trichlorethylene are classified as Human Carcinogens. Perchloroethylene, in addition to its ability to cause cancer, can cause symptoms such as nausea, dizziness, confusion, headache, and eye and mucous membrane irritation.

The health risks from taking no action at the Roxy site would expose the resident population to a potential increase of 86 cancer deaths per 100,000 people exposed to the site's contaminant level for a period of thirty years. This level exceeds the acceptable risk range and certifies site remediation.

Currently, 19 wells are impacted by the solvents released by Roxy, and carbon filters have been installed on these private wells.

II. PROPOSED REMEDIAL ACTION PLAN

A. ALTERNATIVES CONSIDERED

1. GROUNDWATER REMEDIATION

a.Description

Three alternatives were considered for remediation of contaminated groundwater. The first, deemed Ground Water-1 (GW-1) was for no further action. Because of the nature and extent of the contamination, this was rejected.

The second considered, GW-2, was the pumping of water from the aquifer immediately around the Roxy site, "air stripping"[1] the water to remove contamination, and discharging the treated effluent to the Wynantskill Creek. This was rejected because the contamination that had spread, and is spreading, off-site would not be remediated.

The third alternative, GW-3, which is that preferred by DEC, DOH, and Rensselaer County Environmental Management Council is the pumping of water from the aquifer on-site and off-site, "air stripping" the water to remove contamination, and discharging the treated effluent to the Wynantskill.

b. Cost and Effectiveness

The cost for GW-3, including capital and operation and maintenance costs is approximately $1,300,000. The feasibility study estimates that GW-3 would remediate on-site groundwater in 20-45 years and would remediate the off-site contamination in 36 or more years. While this may seem lengthy, it appears to be the most effective manner to remediate the contamination in and around the Roxy site. In comparison, the cost of GW-2, which does not capture the off-site contamination, is $826,900.

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[1]. "Air Stripping" basically passes compressed air through the contaminated water, evaporating the highly volatile solvents into the air. This contaminated air is then passed through activated carbon filters, mitigating air contamination potential.

2.DRINKING WATER

a. Description

Two alternatives were considered to remediate the drinking water dilemma created by Roxy's business practices.

The first alternative, called Private Water-1 ("PW-1"), called for no further action. This would mean that the carbon filtering system currently installed on 19 area wells would remain and be maintained by DEC or another agency\contractor.

The second alternative, PW-2, recommends the connection of homes in the affected area to a municipal water supply. Envisioned in this alternative is an extension of Troy's municipal water line from the Troy\Wynantskill line, approximately one-mile from the site.

The municipal water alternative, PW-2, is the preferable choice of DEC, DOH, and RCEMC. It is, without doubt, the quickest, safest, and most efficient remediation measure possible to separate the affected residents from the potential contamination and resultant adverse health effects from exposure to the cleaning solvents in and around the Roxy site.

b. Cost and effectiveness

Interestingly, the cost of connecting the residents to municipal water is nearly half that of the less-preferable alternative of "no-action". Indeed, no further action carries a total capitalized cost of $1,048,700 as compared to $643,500 for connection to a public water supply.

B. LIABILITY FOR PAYMENT

DEC is currently attempting to recover costs from Roxy and Mardigan Property, Inc., who leased the land to Roxy for the dry-

cleaning operation. If that effort is not successful, DEC will attempt to secure funds through the Federal EPA Superfund mechanism. This will require the placement of the Proposed Remediation program for the Roxy site and surrounding areas on the national Superfund priority list. If that effort is not successful, clean-up costs will be recovered from the State Superfund program.

It goes without saying that the preferable method of cost recovery is from Roxy and Mardigan, the responsible parties. The second most preferable option is recovery of costs through the Federal Superfund program. This exposes the state and county taxpayers to the least financial impacts, assuming efforts to recover from Roxy\Mardigan fail. The State Superfund mechanism, the least preferable, would be funded by New York's taxpayers.

III. COMMENTS BY RCEMC

A. GENERAL

As this County's EMC is charged with the responsibility of tracking and ensuring the integrity of Rensselaer County's natural resources, we are concerned with this threat upon a local, but valuable, aquifer.

While Roxy Cleaners is a monument to everything wrong with the way we conducted business in the past, the handling of this travesty by DEC and DOH-although painfully slow,-is testimony and a monument to everything right with the way we address these issues today.

The Roxy epic also serves as documentation that it is far more cost-effective to operate a business with an eye on environmental protection than not.

In this instance, the societal cost of Roxy's negligence is not to be dismissed lightly. In dollar costs alone, society bears the burden of nearly $2 million in remediation costs. In less

defined costs, our children's grandchildren could witness the remediation of the off-site plume. As mentioned infra, the contamination resulting from Roxy's malfeasance for 29 years now triggers a clean-up program that may not be complete for 45 years. When coupled with the financial freight we now must haul, the Roxy chronicle should serve as proof positive that the folly of turning one's commercial back on environmental concerns can and most probably will be socially disastrous.

B. SPECIFIC

As mentioned before, the EMC endorses the alternatives chosen and advocated by DEC and DOH. We have limited comments to add to this review, but are confident that the concerns we have will be given due consideration.

1. ALTERNATIVES

There is no question that providing municipal water to the affected and neighboring residences is the preferable option. Similarly, the preferable remediation measure for contaminated ground water appears to be the most prudent and expeditious approach. However, RCEMC has the following comments:

1. With regards to the discharge of treated effluent to the Wynantskill Creek, the EMC stresses that it is important to minimize the erosion potential. When the final design and location for the outfall structure is distinguished, RCEMC would like to be notified before construction commences, and would appreciate the opportunity to review plans.

2. As referenced in our oral comments given on January 5, 1994, any given plan is only as good as its implementation. EMC would like to review the O&M plan for the vapor phase carbon absorption system,

and would like to explore further the capture efficiency of this control technology.

3. The EMC would like to see a contingency plan for the discharge structure in the event that the chosen design causes excess silt in the Wynantskill, possibly adversely affecting the spawning activity naturally occurring in the stream.

4. The EMC echoes the concerns about the spreading of the off-site plume, and stresses that it is of the utmost importance to expedite the remedial process to enable the delivery of municipal water to the site, as well as protecting the wetland that lies downstream of the contamination site.

2. PUBLIC INVOLVEMENT

The DEC and DOH have undertaken a monumental task in this proceeding, and have been extremely diligent in involving and educating the public. To say the effort and results deserve praise is to understate the achievements of these agencies in this case.

We hope and trust that the agencies continue to include and involve the affected residents and local governments as the remedial process unfolds. The EMC would like to be involved in, and offer our assistance with, an ongoing stream monitoring program once the ground water treatment process gets underway.

IV. CONCLUSION

It is an unfortunate reality that environmentalists and those concerned with the protection of local and regional natural resources often find themselves at odds with state and\or federal

regulators. Whether it be a difference of opinion in the interpretation of scientific fact (or theory), or frustration with the perceived lack of responsiveness by a particular department, the relationship between the regulatory agencies and lay people or affected citizens is oft-times tenuous, at best.

Indeed, handling of environmental tragedies ranging from the Love Canal to the Valdez oil spill has left a great deal of distaste and distrust in the hearts and minds of many ordinary people.

Yet standing in striking contrast to the way regulators are often perceived, is the handling of the Roxy catastrophe. It is difficult to imagine how this long and painful healing and recovery process could have been handled better, and the absence of animosity at the January 5 public hearing was an absolutely incredible tribute to DEC's and DOH's diligence and competence.

In closing, the EMC presents that the manner in which this review and remedial investigation\action has been conducted to date should serve as a model for all future similar actions.

Rensselaer County Environmental
Management Council
1600 Seventh Avenue
Troy, New York 12180
(518) 270-2888

Letter and Attachments

From Attorney for

Potential Responsible Party (PRP),

President of

Roxy Cleaners, Inc.

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*KANSAS PRACTICE LIMITED TO NATIONAL COLLEGIATE ATHLETIC ASSOCIATION COMPLIANCE AND INFRACTIONS MATTERS

January 21, 1994

HAND-DELIVERED

Kathryn Eastman
Environmental Engineer 1
NYSDEC
Bureau of Central Remedial Action
Div. of Hazardous Waste Remediation
50 Wolf Road, Room 224
Albany, New York 12233

Re: Roxy Cleaners Site
(Registry No. 442024)

Dear Ms. Eastman:

These comments are provided on behalf of Roxy-United Cleaners, Inc. ("Roxy"), which has reviewed the December 1993 Proposed Remedial Action Plan ("PRAP") prepared by the New York State Department of Environmental Conservation ("NYSDEC") for the so-called "Roxy Cleaners Site" (the "Site") located in Wynantskill, New York. Roxy's comments on various sections of the PRAP follow:

Section 3: Site History

Subsection 3.1: Operational/Disposal History

John Siedhoff, Roxy's President since 1986, has been involved in day-to-day operations of the business since 1981, including operations at the Main Street Store at the Site, and can attest to the following:

(1) Roxy had discontinued all use of tetrachloroethene or perchloroethylene ("PCE") at the Main Street Store by May or June 1987, not 1988. From sometime prior to 1981 until May or June 1987, Roxy used PCE in a closed dry cleaning system operated at the Main Street Store.

(2) Mr. Siedhoff has no personal knowledge of and has never been able to confirm the occurrence of any spill of 55 gallons of PCE outside near the rear of the building in 1984. See, letters dated June 14, 1990 from S. P. Read to D.A. Tuohy; August 22, 1990 from D.A. Tuohy to S.P. Read; and September 12, 1990 from S.P. Read to D.A. Tuohy with its enclosure, letter dated August 29, 1990 from J. Siedhoff to S.P. Read, attached as Exhibits "A", "B" and "C" respectively. In fact, in 1984 PCE was not routinely delivered to or maintained at the Main Street Store in drums: Roxy's distributor routinely delivered PCE from a truck through a hose connected directly into the dry cleaning machine located inside the building. The Main Street Store has no floor drains into any sewer or septic system.

(3) Mr. Siedhoff has no knowledge of any spills of PCE into the environment at any time subsequent to 1981. Further, from at least 1981 through mid-1987 Roxy disposed and/or recycled at proper or approved off-site locations any material(s) containing PCE residue not recoverable by Roxy.

These facts and the distribution or dispersal of PCE contaminants identified in the PRAP establish that whatever "undocumented events and practices" may have caused or contributed to PCE contamination attributable to the Site must have occurred sometime prior to 1981.

Subsection 3.2: Remedial History

On May 3, 1989, Mr. Siedhoff reported to a NYSDEC employee that management of the Stewart's Shop then located adjacent to the Main Street Store had arranged for sampling both a deep and a shallow well behind its store; that analysis of these samples had disclosed the presence of PCE; and that Roxy had retained Adirondack Environmental Services ("Adirondack") to resample these wells and also to obtain and analyze samples from other commercial and residential wells in the Main Street area.

On Friday, May 26, 1989, Mr. Siedhoff received a report from Adirondack, which indicated that certain of the samples taken by Adirondack on May 11, 1989 had been found to contain PCE. Mr. Siedhoff called NYSDEC Region IV that same day, the Friday before the Memorial Day Weekend, and called again and met with Region IV officials on Tuesday, May 30, 1989 to disclose the data in the report that he had received from Adirondack the previous Friday.

Roxy has always understood that its disclosures on May 30, 1989 were solely responsible for prompting the New York

State Department of Health ("NYSDOH") and the Rensselaer County Health Department thereafter to initiate further residential and commercial wellwater sampling and analysis and for prompting NYSDEC to undertake investigatory and remedial activities at the Site. Further, Mr. Siedhoff does not recall ever knowing that after May 3, 1989 "NYSDEC immediately took another sample [at the Stewart's Shop location] for analysis and found perchloroethylene at 1370 ppb and lesser amounts of trichloroethylene and dichloroethylene." PRAP, p. 8. In fact, the data received by Mr. Siedhoff from Adirondack on May 26, 1989 and reported by him to NYSDEC on May 30, 1989 included a sampling result of 1370 ppb PCE in a grab sample obtained by Adirondack (not NYSDEC) from the Stewart's Shop location on May 11, 1989. See Exhibit "D", pp. 1 and 11 from Adirondack's Laboratory Report dated May 18, 1989 and stamped as received on May 26, 1989.

These facts establish that Roxy acted responsibly to investigate potential contamination and promptly reported information and data to NYSDEC/NYSDOH.

Section 4: Current Status

Subsection 4.1: Remedial Investigation; Site Related Chemicals of Concern

The PRAP categorically declares that "[p]erchloroethylene and trichloroethylene are both classified as Probable Human Carcinogens" (p. 10) as though there were scientific consensus on this issue. In fact, there is considerable scientific debate about whether the United States Environmental Protection Agency ("USEPA") should classify these chemicals as possible (Class C) or probable (Class B) human carcinogens. Indeed, after an extensive, widely followed and reported review of the latest scientific data USEPA's Science Advisory Board in 1991 found insufficient evidence for placing PCE in Class B. Further, the PRAP provides no reference to support its discussion of the purported contrasting effects of "low doses of acute inhalation" (an undefined concept) of PCE and "acute doses" of trichloroethylene and dichloroethylene.

Next, the PRAP does not indicate whether the RI considered any potential historic sources of groundwater contamination in the Main Street area other than the Site. For example, the building fronting on Dodge Street (470 pp PCE in Figure 4, p. 13) was a North Greenbush Police location until approximately 1985. Prior to that, we understand that an automobile repair shop was operated there. At least one other building in the Main Street area was formerly the site of a

gasoline station. Yet Figures 3 and 4 simply appear to link scattered data with inferred isolines, based on an assumption that the Site is the source of all overburden and bedrock contamination detected during the RI.

The copy of the PRAP provided us has no Tables 3 and 4, p. 15. Figure 5, p. 16 refers to TCE rather than PCE. Is this correct?

Section 8: Summary of the Preferred Remedy

Subsection 8.1: Rationale for Selection of Groundwater Remedial Alternative

NYSDEC proposes Alternative GW-3 for groundwater, or installation and operation of a pump-and-treat system for the onsite overburden and bedrock and offsite overburden aquifers. The capital cost for this remedy is $606,200 and the present worth of 30 years of operation and maintenance is $693,800, which amounts to total capitalized costs of $1.3 million. GW-3's stated "primary goals" are contaminant mass reduction, lessened contaminant migration and reduced potential risks to human health associated with contaminated soil gas; its stated "secondary" goal is compliance with standards, criteria and guidance ("SCGs").

Although Alternative GW-3 may achieve its stated primary goals to a degree, their attainment does not reduce any actual current or probable future risk to human health or the environment attributable to PCE contamination:

(1) The risk to human health from ingestion or dermal exposure to contaminated groundwater has been essentially eliminated by use of filters and will be absolutely eliminated by provision of a public water supply regardless of the mass of PCE contaminants remaining in the aquifers.

(2) The RI apparently estimated that inhalation of volatiles would increase additional cancer cases by 7 per 100,000 persons exposed to the Site's 95% contaminant level (1100 ppb PCE) for thirty (30) years. There is, of course, no evidence that any such exposures ever have occurred or could occur in the future. Apparently, NYSDEC detected PCE in indoor air at "low, but significant" levels only in an older commercial building in 1990 and determined that an additional building, containing a basement apartment, was within the purported soil gas plume. PRAP, pp. 8, 10. Both potential exposures were remedied by modest means; i.e., installation of a ventilation system;

plugging holes in a foundation. In other words, NYSDEC need not spend $1.3 million to lessen any remaining minimal potential risk to human health associated with contaminated soil gas.

(3) The PRAP does not specify whether, or to what extent, monitoring since 1989 has disclosed any continuing contaminant migration; specifically, it is impossible to evaluate whether, or to what extent, contaminants are, in fact, migrating into otherwise clean areas. (The PRAP does not establish a well-defined plume with a leading edge that has advanced over the past several years of monitoring.) Further, there is no possibility for future introduction of additional PCE into groundwater at the Site, and NYSDEC claims to have removed 346 pounds (approximately 25½ gallons) of PCE at substantial cost during the Interim Remedial Measure. As a result, the PRAP does not demonstrate that any human health or environmental risks will be reduced by lessening any further migration that may occur.

(4) The Site now poses no risk to the environment: NYSDEC found the stream unaffected by Site-related contamination. PRAP, p. 10. In other words the mass of PCE contaminants remaining in the aquifers currently poses no risk to the environment and concentrations can only attenuate over time.

In essence, GW-3 amounts to treatment for treatment's sake and serves no purpose justified by its $1.3 million cost. Certainly NYSDEC should not create an artificial need for treatment by hypothesizing human health risks based on highly exaggerated, unrealistic exposure assumptions (i.e., the projected cancer risk from inhalation of volatiles).

Further, NYSDEC does not need to implement GW-3 in order to determine its potential cost-effectiveness in achieving the secondary goal of compliance with SCGs: the scientific community has already expressed its unequivocal view on the severe limits of groundwater pump-and-treat remedies, based on data from numerous Superfund sites. The eminent Professors R. Allan Freeze and John A. Cherry stated as long ago as 1989 that

> attempts at aquifer remediation, where the goal has been to return a water-supply aquifer to a state where its water meets drinking water standards, have almost without exception been a failure. If not an outright failure, they have made so little progress that expectation is for success not to be achieved in this century and maybe not in the next one.

R. Allan Freeze and John A. Cherry, "What Has Gone Wrong", 27 Groundwater 458, 463 (July-August 1989).

Further, PCE, a Dense Non-Aqueous Phase Liquid ("DNAPL"), is the principal groundwater contaminant for which NYSDEC proposes to achieve SCGs. As Professors Freeze and Cherry have graphically stated:

> [t]here is now little doubt that at sites where DNAPLs are the problem, the local ground-water zone has terminal cancer. A cure, in the form of returning aquifer quality to drinking-water standards, is unachievable at almost any cost. At DNAPL sites, costs are going up and aquifers are not much improved.

Id. See, also, C.B. Doty and C.C. Travis, "The Effectiveness of Groundwater Pumping as a Restoration Technology," ORNL/TM-11866 (Oak Ridge National Laboratory 1991); EPA, "Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration", OSWER Publication 9234.2-25 (September 1993).

Subsection 8.2: Rationale for Selection of Private Water Supply Remedial Alternative

Provision of a public water supply to the Main Street area has always been and remains a common-sense measure, given not only the PCE contamination discovered in 1989, but also the groundwater's naturally poor quality and the threat of groundwater contamination posed by commercial development in this area. The PRAP does not specify why NYSDEC estimates an additional 1-2 years for forming a water district and designing an extension. PRAP, p. 26.

Very truly yours,

BOND, SCHOENECK & KING

By: Susan Phillips Read
Susan Phillips Read

SPR/dm

cc: J. Siedhoff, President, Roxy-United Cleaners, Inc.

EXHIBIT A

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June 14, 1990

Dolores A. Tuohy, Esq.
New York State Department of
Environmental Conservation
50 Wolf Road, Room 415
Albany, New York 12205

Re: **Roxy-United Cleaners**

Dear Dolores:

Thank you for forwarding to me the "Phase I and II Hydrogeologic Investigation" at Roxy-United Cleaners, Inc.'s Wynantskill facility prepared for the Department by Empire Soils Investigation, Inc. At section 1.2.5., the report states that there was a PCE spill in 1984 at the facility and attributes this information to the "owner of Roxy Cleaners." Who is Empire Soils' source of this information, and what, if any, further information is there about this alleged spill?

Very truly yours,

BOND, SCHOENECK & KING

By: Susan Phillips Read

SPR/dm

cc: John Siedhoff

bcc: Daniel J. Centi, Esq.

EXHIBIT B

cc: Dan Curtis
John Seidhoff

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-5501

Thomas C. Jorling
Commissioner

August 22, 1990

Susan Phillips Read, Esq.
Bond, Schoeneck and King
111 Washington Avenue
Albany, New York 12210-2280

RE: Roxy-United Cleaners

Dear Susan:

This letter will respond to your letter of June 14, 1990 in which you requested the source of information reported at Section 1.2.5 of the Department's "Phase I and II Hydrogeologic Investigation" report for Roxy-United Cleaners.

The engineers supervising the project have informed me that Mr. Seidoff approached Kirk Moline, an employee of the Department's consultant performing the site investigation, on July 28, 1989 and offered the information. According to Mr. Moline, Mr. Seidoff stated that he recalled only one incident which could have been responsible for groundwater contamination in the area. The incident involved the spillage of a 55-gallon drum of PCE at the Roxy facility in 1984.

Very truly yours,

Dolores A. Tuohy

Dolores A. Tuohy
Senior Attorney
Division of Environmental
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(518) 457-3296

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September 12, 1990

Dolores A. Tuohy, Esq.
New York State Department of
Environmental Conservation
50 Wolf Road, Room 415
Albany, New York 12205

Re: **Roxy-United Cleaners, Inc.**
Main Street Facility, Wynantskill, New York

Dear Dolores:

Thank you very much for your letter dated August 29, 1990 and its enclosures, revised pages from the report prepared by Empire Soils, Inc.

Section 1.2.5 of the report is incorrect, as the essentially self-explanatory letter dated August 29, 1990 from John Siedhoff to me (enclosed) indicates. Mr. Siedhoff has no personal knowledge of a PCE spill at the Main Street facility in 1984, or at any other time for that matter. Nor does Mr. Siedhoff recall ever having spoken to Mr. Moline about any topic. Indeed, Mr. Siedhoff's diary records indicate that he was not even present at the Main Street facility during business hours -- if at all -- on July 28, 1989 when Mr. Moline claims to have spoken with him.

During the summer of 1989, as you may recall, there was a great deal of publicity about the discovery of PCE-contaminated well water in the vicinity of the Main Street facility. Thereafter, Mr. Siedhoff received a telephone call from a former employee to report that he had heard from yet another former employee that a truck had hit a 55-gallon drum of PCE in 1984, causing spillage at the Main Street facility. In 1984, 55-gallon drums containing viscous, pourable tar-like material from a distillation unit with an estimated 5-15% PCE content would have been stored at the Main Street facility from time to time, awaiting pickup by a licensed waste transporter.

This information, if it could be confirmed, would be very helpful to Roxy because it would clearly establish the date

of the sudden and accidental occurrence for purposes of Roxy's comprehensive general liability insurance policies. Accordingly, we tried to confirm it.

The former employee identified as the source of the information had been terminated from his employment at Roxy in 1985. He was uncooperative, is antagonistic towards Roxy (and Mr. Siedhoff personally) and would not -- or could not -- confirm the circumstances of any 1984 PCE spill to us. We also talked to other individuals whose jobs at Roxy in 1984 might have placed them in position to observe any PCE spill then occurring at the Main Street facility. None of these individuals observed such a spill.

If Mr. Moline truly obtained information that a PCE spill occurred in 1984 from someone with first-hand knowledge, we would be most interested to pursue this matter. My suspicion, however, is that someone who learned of this rumored spill from Mr. Siedhoff in turn reported the rumor to Mr. Moline as if it were fact, or Mr. Moline simply misunderstood it as fact.

Very truly yours,

BOND, SCHOENECK & KING

By: Susan Phillips Read

SPR/dm
Enclosure

cc: John Siedhoff

EXHIBIT C

ROXY UNITED CLEANERS

242 BROADWAY • MENANDS • NEW YORK 12204 • 518-472-1366

August 29, 1990

Ms Susan Phillips Read, Esq.
Bond, Schoeneck and King
111 Washington Avenue
Albany, New York 12210

Dear Susan:

Thank you for forwarding a copy of Dolores Tuohy's letter (to you) dated 08/22/90.

Mr. Moline of Empire Soils (?) must be confused by someone masquerading as me.

I looked up my notes for 07/27/89 and 07/28/89 and discovered the following:

07/27/89	3:00PM	Boiler inspection preperation
	5:00PM	Boiler inspection at bldg #6 (Albany)
	6:00PM - 7:00PM	meeting - rescheduled
	9:00PM	- finished boiler close-up & static test
07/28/89	6:30AM	Boiler observation at bldg #6 (Albany)
		start up problems ironed out by 11:00AM-
		leaking hand hole gaskets-reset after 3:00PM

The notes were just enough for me to remember practically all of the problems of that day at bldg #6 (Albany), (these are normal re-start problems after a boiler inspection). If I even stopped at bldg #12 (Wynantskill) on 07/28/89, it would have been after 7:00PM.

I do not know who this Mr. Moline spoke to, but it sure was not me. It is possible that someone is vindictively trying to involve me, and they know something that I do not know.

Sincerely,

John Siedhoff

John Siedhoff

EXHIBIT D

Adirondack Environmental Services, Inc
P.O. Box 265
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A full service analytical research laboratory offering solutions to environmental concerns

RECEIVED JUN 7 8 1989

LABORATORY REPORT

for

Roxy Cleaners
242 Broadway
Menands, NY 12204

Attention: Mr. John Seidoff

Report date: 05/18/89
Number of samples analyzed: 11
AES Project ID: 890511 O

Adirondack Environmental Services, Inc.

Adirondack Environmental Services Inc
P.O Box 265
298 Riverside Avenue
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(518) 434-4546 , 434-0891 FAX

A full service analytical research laboratory offering solutions to environmental concerns

CLIENT: Roxy Cleaners
CLIENT'S SAMPLE ID: Stewarts
AES sample #: 890511 O10
Samples taken by: Randy Hough
MATRIX: potable water
Date Sampled: 05/11/89
Date sample received: 05/11/89
Location: Wyantskill Brch
grab

PARAMETER PERFORMED	METHOD	RESULT	UNITS	NOTEBK REF	TEST DATE
Tetrachloroethylene	EPA-601	1370	ug/l	MA-H-7	05/12/89