RECORD OF DECISION

Little Valley Superfund Site
Little Valley, Cattaraugus County, New York

United States Environmental Protection Agency
Region II
New York, New York
August 2005

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Little Valley Superfund Site
Little Valley, Cattaraugus County, New York

Superfund Site Identification Number: NYD0001233634
Operable Unit 2

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the U.S. Environmental Protection Agency's (EPA's) selection of a remedy for the Little Valley Superfund site (Site), which is chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. §9601, *et seq.*, and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300. This decision document explains the factual and legal basis for selecting the remedy for the Site. The attached index (see Appendix III) identifies the items that comprise the Administrative Record upon which the selection of the remedy is based.

The New York State Department of Environmental Conservation (NYSDEC) was consulted on the planned remedy in accordance with CERCLA Section 121(f), 42 U.S.C. §9621(f), and it concurs with the selected remedy (see Appendix IV).

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The response action described in this document represents the second and final remedy planned for the Site. It addresses contaminated soil and groundwater, which has been designated as Operable Unit 2. A previous ROD, signed on September 30, 1996, selected an interim remedy for the Site, referred to as Operable Unit 1. The interim remedy, which provided for the installation and maintenance of point-of-use treatment systems for private wells affected by Site contamination, is now the final remedy for Operable Unit 1.

The major components of the selected remedy include the following:

- Excavation of approximately 200 cubic yards of trichloroethylene (TCE)-contaminated soil exceeding the New York State Technical and Administrative Guidance Memorandum No. 94-HWR-4046 (TAGM) objective[1] of 700 micrograms per kilogram to an estimated depth of four feet at two locations in the Cattaraugus Cutlery Area;

- Post-excavation confirmatory soil sampling;

- Backfilling of excavated areas with clean fill;

- Characterization and transportation of excavated material for treatment and/or disposal at an off-Site facility in compliance with the Resource Conservation and Recovery Act;

- Monitored natural attenuation of the TCE-contaminated groundwater underlying the Bush Industries, Cattaraugus Cutlery, Great Triangle, and Ninth Street Landfill Areas, as well as the Site-wide groundwater plume; and

- Periodic groundwater sample collection and analyses to verify that the contaminants are declining in concentration and in extent as a result of natural attenuation.

This alternative also includes institutional controls. Specifically, after an initial notification, NYSDEC, the New York State Department of Health, and/or the Cattaraugus County Health Department will periodically meet with or notify local governmental agencies to remind them that if any unimproved parcel where the underlying groundwater is contaminated with TCE above the Maximum Contaminant Level is developed, the groundwater should not be used without treatment. EPA will also notify the Bush Industries and Cattaraugus Cutlery Area property owners that the underlying groundwater is contaminated and should not be used without treatment. As part of EPA's natural attenuation monitoring at the Bush Industries and Cattaraugus Cutlery Areas, the properties will be inspected annually to verify that wells without treatment systems have not been installed. An annual report summarizing the results of the groundwater monitoring and the findings of such inspections will be prepared.

An evaluation of the potential for soil vapor intrusion into structures within the study area will be conducted; mitigation may be performed, if necessary.

In addition, until groundwater standards are met, public health will continue to be protected with the point-of-use treatment units that were installed pursuant to the 1996 interim remedy decision for drinking water at the Site. NYSDEC will continue to monitor the private

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1 *Division Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels*, Division of Hazardous Waste Remediation, New York State Department of Environmental Conservation, January 24, 1994.

wells and maintain the individual point-of-use treatment units until groundwater standards are met at the individual wells.

The selected remedy will address source materials constituting principal threats by excavating and treating and/or disposing of the contaminated soil on the Cattaraugus Cutlery Area.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in CERCLA Section 121, 42 U.S.C. §9621, because it: 1) is protective of human health and the environment; 2) meets a level or standard of control of the hazardous substances, pollutants and contaminants, which at least attains the legally applicable or relevant and appropriate requirements under federal and state laws; 3) is cost-effective; and 4) utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. In keeping with the statutory preference for treatment that reduces toxicity, mobility, or volume of contaminated media as a principal element of the remedy, some of the contaminated soil will be treated.

This remedy will result in the reduction of hazardous substances, pollutants, or contaminants to levels that will permit unlimited use of, and unrestricted exposure to, soil and groundwater in an estimated three months and 10 years, respectively. It is EPA's policy to conduct five-year reviews when remediation activities, including monitoring, will continue for more than five years. Therefore, under the selected remedy, EPA will continue to conduct five-year reviews at least once every five years. Because EPA conducted a five-year review for the alternate water supply interim remedy at this Site in May 2002, the next five-year review will be conducted on or before May 2007; it will be a Site-wide review.

ROD DATA CERTIFICATION CHECKLIST

The ROD contains the remedy selection information noted below. More details may be found in the Administrative Record file for this Site.

- Contaminants of concern and their respective concentrations (see ROD, pages 6-8);
- Baseline risk represented by the contaminants of concern (see ROD, pages 9-14);
- Cleanup levels established for contaminants of concern and the basis for these levels (see ROD, Appendix II, Tables 1-4);

- Current and reasonably-anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD (see ROD, page 9);

- Manner of addressing source materials constituting principal threats (see ROD, pages 30-31);

- Key factors used in selecting the remedy (*i.e.*, how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision)(see ROD, pages 31-32);

- Estimated capital, annual operation and maintenance, and present-worth costs; discount rate; and the number of years over which the remedy cost estimates are projected (see ROD, page 34); and

- Potential land and groundwater use that will be available at the Site as a result of the selected remedy (see ROD, page 35).

AUTHORIZING SIGNATURE

Raymond Basso

William J. McCabe, Deputy Director
Emergency and Remedial Response Division

8/19/05
Date

RECORD OF DECISION FACT SHEET
EPA REGION II

Site

Site name:	Little Valley Site
Site location:	Little Valley, Cattaraugus County, New York
HRS score:	Listed on the basis of an ATSDR Health Advisory
Listed on the NPL:	June 17, 1996

Record of Decision

Date signed:	August 19, 2005
Selected remedy:	Excavation and off-Site treatment and/or disposal of contaminated soils at one source area and monitored natural attenuation and institutional controls to address the contaminated groundwater.
Capital cost:	$136,000
Operation and maintenance cost:	$34,000
Present-worth cost:	$374,000[1]

Lead

EPA

Primary contact:	Patricia Simmons Pierre, Remedial Project Manager, (212) 637-3865
Secondary contact:	Joel Singerman, Chief, Central New York Remediation Section, (212) 637-4258

Main PRPs

Bush Industries, Inc.

Waste

Waste type:	Volatile organic compound (TCE)
Waste origin:	On-Site spills/discharges
Contaminated media:	Soil and groundwater

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[1]The point-of-use treatment systems need to be operated until MCLs are reached. The estimated annual O&M cost for the point-of-use treatment systems is $101,000. For the ten years of their operation while Alternative GW-2 is being implemented, the overall present-worth cost is $710,000. Therefore, the actual estimated capital, annual O&M and monitoring, and present-worth costs for the selected groundwater remedy are $0, $135,000, and $948,000, respectively.

DECISION SUMMARY

Little Valley Superfund Site
Little Valley, Cattaraugus County, New York

United States Environmental Protection Agency
Region II
New York, New York
August 2005

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SITE NAME, LOCATION, AND DESCRIPTION

Since 1982, chemical analyses of groundwater samples collected from monitoring and private wells throughout the Little Valley Superfund site (Site)[2] have indicated the presence of trichloroethylene (TCE), a common industrial cleaning solvent. The TCE groundwater plume, which comprises the boundaries of the Site, extends approximately eight miles southeastward from the Village of Little Valley through the Town of Little Valley to the northern edge of the City of Salamanca, which is part of the Allegheny Indian Reservation. The Site is located in a rural, agricultural area, with a number of small, active and inactive industries and over 200 residential properties situated in the study area along Route 353, the main transportation route between Little Valley and the City of Salamanca.

While the industry, businesses, and residences located in the Village of Little Valley (including the area located approximately one-quarter mile south of the Village's corporate limits along New York State Highway 353) obtain water from the Public Water Supply of the Village of Little Valley, private water supply wells constitute the only source of water for the Town of Little Valley and the northern portion of the City of Salamanca.

The nearest surface water bodies associated with the Site are Little Valley Creek and its tributaries. Little Valley Creek, a perennial stream with typical stream flow ranging from 20 to 80 cubic feet per second during normal precipitation periods, flows southeast, then south through the Site for approximately eight miles before joining the Allegheny River. The Site ranges in width from 1,000 to 2,500 feet and in elevation from nearly 1,600 feet above mean sea level (msl) in the Village of Little Valley to less than 1,400 feet msl near the Salamanca city line. The Site is bordered by steeply sloping wooded hillsides which attain slopes of up to 25 percent and elevations of 2,200 feet above msl.

Figure 1 shows the Site area.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

In 1982, Cattaraugus County Health Department (CCHD) and NYSDEC, while investigating TCE contamination at the Luminite Products Corporation (Luminite) facility located in the City of Salamanca, detected TCE in nearby private wells.

In 1989, NYSDEC sampled the plant production well, process wastewater, and septic tank on the Luminite property, as well as nearby New York State Department of Transportation monitoring wells. The analytical results indicated that groundwater contamination was present both upgradient and downgradient of the Luminite facility, with the groundwater plume extending from the Village of Little Valley to the northern edge of the City of Salamanca.

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[2] The Site's Superfund Site Identification Number is NYD0001233634. EPA is the lead agency; NYSDEC is the support agency. It is anticipated that Superfund monies will be utilized to implement at least a portion of the selected remedy.

Based on these findings, the CCHD issued health advisories to exposed residents and efforts were initiated to determine sources of TCE contamination upgradient of Luminite.

In 1992, NYSDEC installed a number of monitoring wells in the area, and conducted source reconnaissances at the other active and inactive industries and waste disposal areas to investigate possible sources of the contamination. No sources were found.

In June 1996, EPA listed the Site on the National Priorities List, and prepared a focused feasibility study (FFS) to develop, screen, and evaluate alternatives for an alternate water supply system for the affected and potentially affected residences to address the most immediate concerns at the Site.

Based upon the findings of the FFS, on September 30, 1996, EPA issued a ROD, providing for the installation of air stripper treatment units on all of the affected and potentially affected private wells, as an interim remedy, to ensure that drinking water standards were met. Air strippers were selected because, based upon the maximum TCE concentrations that were present in the private wells at that time, they would be significantly less costly to maintain than granular activated carbon treatment units.

In September 1996, EPA also commenced an RI/FS to identify sources of the groundwater contamination and to evaluate remedial alternatives for the groundwater.

Installation of the air stripper treatment units was completed in October 1997. Subsequently, granular activated carbon units were installed in addition to the air strippers as polishing units to insure the consistent removal of contaminants.

The ROD also called for an evaluation of the efficacy of the point-of-use treatment systems within five years of their installation, and a determination as to whether or not a more permanent system (such as a waterline) would be required. In an April 2002 Explanation of Significant Differences (ESD), EPA determined that it would be more appropriate to evaluate the need for a permanent alternative water supply during the selection of the final groundwater/source area remedy for the Site. EPA also determined that because of the decreasing levels of contaminant concentrations in the private wells, granular activated carbon units alone would effectively remove the contamination. Subsequently, the air stripper treatment units were removed from each well and replaced with a second granular activated carbon unit.

On May 16, 2002, five years after the initiation of the implementation of the alternate water supply interim remedy, EPA conducted a five-year review at the Site. This five-year review found that the point-of-use treatment units called for in the first operable unit ROD, as modified by the ESD, were functioning as designed and addressed the immediate threat to public health.

NYSDEC assumed responsibility for the operation and maintenance of the point-of-use treatment units and annual sampling of private wells in October 2002. Routine maintenance is conducted on the point-of-use treatment systems on a quarterly basis, and repairs are performed as needed. As part of the ongoing maintenance of the treatment units, NYSDEC evaluates the effectiveness of the treatment units by sampling the groundwater passing through the individual treatment systems on an annual basis.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI/FS reports describe the nature and extent of the contamination at and emanating from the Site and evaluate remedial alternatives to address this contamination. The Proposed Plan identifies EPA and NYSDEC's preferred remedy and the basis for that preference. These documents were made available to the public in both the Administrative Record and information repositories maintained at the EPA Docket Room in the Region 2 offices at 290 Broadway in Manhattan, at the Town of Little Valley Municipal Building, located as 103 Rock City Street, Little Valley, New York and at the Salamanca Public Library, located at 155 Wildwood Avenue, Salamanca, New York.

EPA's 1984 Indian Policy recognizes the government-to-government relationship between EPA and the Nations, as one sovereign to another. EPA has committed to communicating with Nation governments before making decisions on environmental matters affecting Nation governments and/or Nation natural resources. To this end, in May 2005, EPA discussed the preferred remedy and the basis for this preference with Seneca Nation Environmental Protection Department representatives. No concerns related to the preferred remedy were expressed by the Nation's representatives at that time.

A notice of the commencement of the public comment period, the public meeting date, the preferred remedy, contact information, and the availability of the above-referenced documents was published in the *Times Herald* and the *Twin Tiers Trader* on June 27, 2005. The public comment period ran from June 27, 2005 to July 26, 2005. EPA held a public meeting on July 6, 2005 at 7:00 P.M. at the Little Valley Elementary Campus, 207 Rock City Street, Little Valley, New York, to present the findings of the RI/FS and to answer questions from the public about the Site and the remedial alternatives under consideration. Approximately 25 people, including residents, local business people, and state and local government officials, attended the public meeting. On the basis of comments received during the public comment period, the public generally supports the selected remedy. Public comments were related to groundwater monitoring, the agencies' Site-related efforts and responsibilities, the point-of-use treatment systems, exposure and health effects, the scope of the remediation, waterline installation, sources of contamination, and definitions. Responses to the comments received at the public meeting are included in the Responsiveness Summary (see Appendix V)[3].

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[3] One e-mailed comment was received during the public comment period, but a response was not deemed necessary.

The Bush Industries and Cattaraugus Cutlery Areas are currently zoned for industrial use and have been used for this purpose since 1959 and the 1890s, respectively. Since it is unlikely that the Site area will be re-zoned in the future[4], the public's views on the assumptions about reasonably anticipated future land use were not solicited. The public's views on potential future beneficial groundwater uses were not solicited because the aquifer is already designated as a drinking water source.

SCOPE AND ROLE OF OPERABLE UNIT

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Section 300.5, defines an operable unit as a discrete action that comprises an incremental step toward comprehensively addressing Site problems. This discrete portion of a remedial response manages migration, or eliminates or mitigates a release, threat of a release, or pathway of exposure. The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with the Site.

The objective of the first operable unit was to prevent exposure of area residents to contaminated drinking water. Under the first operable unit, on September 30, 1996, EPA issued an interim ROD, providing for the installation of point-of-use treatment units on all of the affected and potentially affected private wells to ensure that drinking water standards were met. EPA completed the installation of point-of-use treatment units in October 1997. The interim remedy is now the final remedy for Operable Unit 1.

The action described in this ROD represents the second and final operable unit for the Site. The primary objectives of this action are to remediate an identified source of contamination at the Site, reduce and minimize the downward migration of contaminants to the groundwater, restore groundwater quality, and minimize any potential future health and environmental impacts.

SUMMARY OF SITE CHARACTERISTICS

The source identification portion of the RI, conducted from 1997 through 2003, investigated the following potential source areas for the presence of TCE and/or TCE-related compounds[5]:

- Ninth Street Landfill Area;

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4 Source: April 23, 2004 letter from Tammy Buchhardt, Clerk, Village of Little Valley. This letter is available in the Administrative Record.

5 Cleanup criteria for TCE and TCE-related compounds in the various media are presented in Tables 1 through 4.

- Bush Industries Area;
- Cattaraugus Cutlery Area;
- King Windows (Second Street) Area;
- First Street Area;
- Great Triangle Area (which includes the Envirotech Drum Storage Area, Western Burnt House Area, Winship Circle/Baker Road Area, and Triangle Southwest Area);
- Whig Street Area;
- Luminite Area;
- State Street Area; and
- Railroad Avenue Area.

The locations of these potential source areas are identified in Figure 2.

Based upon the data collected during the RI, five areas were identified as either current or likely past sources—Bush Industries Area; Cattaraugus Cutlery Area; Great Triangle Area (Drum Storage Area); Luminite Area; and Ninth Street Landfill Area. The history of these areas is described below.

The Bush Industries, Inc.'s facility was used for the manufacture of cutlery by Kinfolks, Inc. from approximately 1926 through 1958. Bush Industries, Inc. currently assembles and manufactures furniture at this location.

The Cattaraugus Cutlery Area consists of several parcels that were used to manufacture cutlery. The W.W. Wilson Cutlery Company, which was formed in the 1890s, operated on the parcels until around 1900, when the company was sold to the Cattaraugus Cutlery Company. The Cattaraugus Cutlery Company manufactured cutlery at this location until the 1950s. Subsequent owners or operators have included Knowles-Fischer (auto parts stamping) and AVM, which owned the property between 1970 and 1977. King Windows, which manufactured stamped metal window parts, is believed to have operated on portions of the property between 1977 and 1993. At present, the property is privately owned, and has been used for storage and a variety of commercial/industrial activities since 1993.

The Envirotech Drum Storage Area within the Great Triangle Area is a parcel of vacant land, approximately one acre in size, located along the southeastern right-of-way of Route 242. This parcel was used as a temporary staging area for drums of solvent wastes brought from three other temporary drum storage areas operated by Envirotech. NYSDEC's records indicate that up to 310 drums were stored on this property in 1980 or early 1981, prior to their transport to the Town of Tonawanda for final disposal.

The Luminite Area, which is located along Route 353, is the former site of a lithographic device manufacturing facility.

The Ninth Street Landfill was a municipal landfill used by the Village of Little Valley from 1950 to 1972 for the disposal of sanitary and industrial wastes. It was alleged that solvent-containing wastes in containers that originated at the Cattaraugus Cutlery/Knowles-

Fisher/AVM/King Windows facilities were disposed in the landfill by Village refuse collection employees. Specific time frames for the alleged disposal activities have not been determined.

The results of the RI are summarized below.

Soil

In an attempt to identify source areas, a soil gas survey was conducted in each of the above-mentioned potential source areas to screen for TCE and TCE-related compounds. Based upon the results of the soil gas survey, 59 soil samples were collected from 45 locations. The results of the soil sampling and sampling locations may be found in Tables 5 through 10 and Figures 3 through 16, respectively. Table 11 summarizes the maximum TCE concentrations detected at each potential source area.

As can be seen from Table 7, TCE concentrations exceeded the New York State Technical and Administrative Guidance Memorandum No. 94-HWR-4046 (TAGM) objective[6] in two locations in the Cattaraugus Cutlery Area—1,200 micrograms per kilogram (µg/kg) at 0 to 2 inches below ground surface (bgs) and 72,000 µg/kg at 1.5 to 2 feet bgs at MWCAA-5 and 11,000 µg/kg at 1 to 2 feet bgs at CAAGEO-6 (see Figure 5).

Sediments and Surface Water

Sediment and surface water samples were collected from 13 locations along the Little Valley Creek and its tributaries. Sediment and surface water data may be found in Tables 12 and Tables 13 through 15, respectively, and sampling locations can be found in Figures 3 through 16. Table 16 summarizes the maximum TCE concentrations detected at each potential source area. As can be seen from these tables, TCE was not detected in any sediments and was detected at only low levels in surface waters. Potential TCE degradation products, such as, cis-1,2-DCE, 1,2-DCA, chloromethane, and chloroethane,

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6 *Division Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels*, NYSDEC, Division of Hazardous Waste Remediation, New York State Department of Environmental Conservation, January 24, 1994.

There are currently no federal or state promulgated standards for contaminant levels in soils. There are, however, other federal or state advisories, criteria, or guidance (To-Be-Considered guidance or "TBCs"), one of which is the New York State TAGM objectives. The soil cleanup objectives identified in NYSDEC's TAGM are either a human-health protection value or a value based on protection of groundwater (calculating the concentration in soil which would theoretically produce contaminant concentrations in the groundwater which would meet groundwater standards), whichever is more stringent. The TAGM is being used as the soil cleanup levels for this site. The TAGM for TCE is 700 µg/kg, which falls within EPA's acceptable risk range (see Table 2).

were present at low levels in the sediments and surface water adjacent to the Bush Industries and Cattaraugus Cutlery Areas.

Groundwater

A total of 313 groundwater samples were collected from 125 locations in an attempt to identify source areas. Groundwater data and sampling locations may be found in Tables 17 through 24, and Figures 3 through 16, respectively.

Table 25 summarizes the maximum TCE concentrations detected at each potential source area. While the groundwater samples showed a valley-wide distribution of TCE, the Maximum Contaminant Level (MCL)[7] was only marginally exceeded in the Great Triangle (14 µg/L; also the maximum historical concentration) and the Ninth Street Landfill (19 µg/L; also the maximum historical concentration) Areas. While the concentration of TCE at the Luminite Area (10 µg/L) exceeded the MCL in 1998, the most recent sample results for this area (2003) show groundwater TCE levels to be below MCLs.

The results of groundwater sampling at the Bush Industries Area indicate the presence of elevated levels of TCE (the most recent sample results show a maximum concentration of 78 µg/L) and its breakdown products (such as 1,2-dichloroethene). The concentration of TCE decreases as the groundwater traverses the property; however, the concentration exceeds the MCL at the property boundary.

A review of the historical groundwater sample results from the Bush Industries Area show that natural attenuation is occurring. TCE concentrations in the two most contaminated monitoring wells have decreased from 230 µg/L and 160 µg/L in samples collected in 1999 to 36 µg/L and 78 µg/L in samples collected in 2003[8], respectively.

For the Cattaraugus Cutlery Area, groundwater concentrations of TCE were as high as 76 µg/L. Sample results do not show a downward trend over time in specific monitoring wells. While TCE concentrations were found to decrease by an order of magnitude as the groundwater traverses the property, TCE concentrations still exceed the MCL at the property boundary.

The groundwater plume was evaluated based upon private well data which have been collected since 1989. Residential well sampling results from 1989 through 2004 are

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[7] EPA and the New York State Department of Health (NYSDOH) have promulgated health-based protective MCLs, which are enforceable standards for various drinking water contaminants. MCLs ensure that drinking water does not pose either a short- or long-term health risk. The MCL for TCE is 5 micrograms per liter (µg/L) (see Table 2).

[8] The other monitoring wells in this area, for the most part, have shown TCE concentrations either below or marginally above the MCL.

provided in Tables 26 and 27; residential well locations are depicted in Figure 17. Of the 91 private wells that have point-of-use treatment systems installed, 90 were sampled in October 2004[9]. The results show that 49 are at or below the drinking water standard of 5 µg/L for TCE. Of the 41 wells that have contaminant levels exceeding the drinking water standard, the majority of these wells only marginally exceed 5 µg/L (32 wells have TCE levels between 6 µg/L and 10 µg/L). In addition, sampling results since 1989 indicate that there are decreasing levels of contamination throughout the groundwater plume in all but a few wells[10]; the highest concentration for the October 2004 sampling event was 22 µg/L, as compared to a historical high of 50 µg/L, and the median concentration is now 6.0 µg/L.

TCE in groundwater was identified as a chemical of potential concern for soil vapor migration from groundwater to indoor air in the study area.

Summary

Based upon the soil data, the Cattaraugus Cutlery Area has been determined to be a current localized source of groundwater contamination at the Site. The approximate extent of TCE-contaminated soils in the Cattaraugus Cutlery Area is depicted in Figure 18. In addition, TCE concentrations in the groundwater underlying this area exceed the MCL and do not appear to be decreasing over time in specific monitoring wells. TCE-contaminated groundwater isoconcentration contours for the Cattaraugus Cutlery Area are depicted in Figure 19. Based upon the TCE concentrations that were detected in the soil and the TCE concentrations which exceed MCLs in the groundwater, the Bush Industries Area also appears to be a current localized source of groundwater contamination. The TCE levels in this area, however, appear to be decreasing due to natural attenuation. TCE-contaminated groundwater isoconcentration contours for the Bush Industries Area are depicted in Figure 20.

The Great Triangle and Ninth Street Landfill Areas have TCE concentrations in the groundwater that exceed the MCL, however, only low levels of TCE were detected in the soils in these areas. Until recently, the groundwater underlying the Luminite Area exceeded the MCL for TCE. At present, the groundwater in this area is below the MCL. While it is likely that the Great Triangle, Luminite, and Ninth Street Landfill Areas may have been sources of groundwater contamination in the past, based upon the current data, they are not acting as current sources.

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9 One property is vacant; the well was inaccessible.

10 These wells are located in the vicinity of the Great Triangle Area.

Conceptual site models[11] for the Cattaraugus Cutlery and Bush Industries Areas are depicted in Figures 21 and 22, respectively.

CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

The TCE groundwater plume, which comprises the boundaries of the Site, extends approximately eight miles southeastward from the Village of Little Valley through the Town of Little Valley to the northern edge of the City of Salamanca. The Site is located in a rural, agricultural area, with a number of small, active and inactive industries and over 200 residential properties situated in the study area. It is unlikely that Site-wide land use will change in the future.

Regional groundwater is a sole source of potable water and is designated as a drinking water source by NYSDEC. While the industries, businesses, and residences located in the Village of Little Valley (including the area located approximately one-quarter mile south of the Village's corporate limits along New York State Highway 353) obtain water from the Public Water Supply of the Village of Little Valley, private water supply wells constitute the only source of water for the Town of Little Valley and the northern portion of the City of Salamanca.

The Bush Industries and Cattaraugus Cutlery Areas are currently zoned for industrial use and have been used for commercial/industrial purposes since 1959 and the 1890s, respectively. As was noted in "Highlights of Community Participation, " above, it is unlikely that the zoning will change in the future. Both Bush Industries and the facility located on the Cattaraugus Cutlery Area obtain potable water from the Public Water Supply of the Village of Little Valley.

SUMMARY OF SITE RISKS

Based upon the results of the RI, a baseline human health risk assessment (HHRA)[12] was conducted to evaluate the potential for current and future impacts of Site-related

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11 A conceptual site model illustrates contaminant sources, release mechanisms, exposure pathways, migration routes, and potential human and ecological receptors.

12 The HHRA, which appears in the *Remedial Investigation Report for the Little Valley Superfund Site, Little Valley, New York,* Volumes 1 and 2 (Tetra Tech FW, Inc., January 2005), is available in the Administrative Record file.

contaminants on receptors using the Site. A screening-level ecological risk assessment (SLERA)[13] was also conducted.

Human Health Risk Assessment

A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: *Hazard Identification*, which identifies the contaminant(s) of concern at a site based on several factors such as toxicity, frequency of occurrence, and concentration; *Exposure Assessment*, which estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (*e.g.*, ingesting contaminated well water) by which humans are potentially exposed; *Toxicity Assessment*, which determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of effect (response); and *Risk Characterization*, which summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks.

EPA conducted a baseline risk assessment to evaluate the potential risks to human health and the environment associated with the Site in its current state. Although the risk assessment evaluated the risks related to TCE, the contaminant of concern, in several of the potential source areas, the significant risks are limited to TCE in the groundwater and soils at the Cattaraugus Cutlery Area. A summary of the concentrations of TCE in sampled matrices is provided in Table 28.

EPA's baseline risk assessment addressed the potential risks to human health by identifying several potential exposure pathways by which the public may be exposed to contaminant releases at the site under current and future land use and groundwater use conditions. Groundwater exposures were assessed for future use scenarios assuming that the groundwater would be used for process water under both washdown and car wash scenarios. In the evaluation of soil exposures at the Cattaraugus Cutlery Area, no site workers are currently present on the property. However, this population was included under a future use scenario based on the current zoning of the property and its potential for future use as a commercial/industrial facility. The reasonable maximum exposure, which is the greatest exposure that is likely to occur at the site, was evaluated.

Under current EPA guidelines, the likelihood of carcinogenic (cancer-causing) and noncarcinogenic (systemic) effects due to exposure to Site chemicals are considered separately. Consistent with EPA guidance, it was assumed that the toxic effects of the site-related chemicals would be additive. Thus, carcinogenic and noncarcinogenic risks

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[13] The SLERA, which appears in the *Remedial Investigation Report for the Little Valley Superfund Site, Little Valley, New York*, Volumes 1 and 2 (Tetra Tech FW, Inc., January 2005), is available in the Administrative Record file.

associated with exposure to TCE were summed to indicate the potential risks associated with mixtures.

Noncarcinogenic risks were assessed using a hazard index (HI) approach, based on a comparison of expected contaminant intake and safe levels of intake (reference doses). Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects. RfDs, which are expressed in units of milligrams per kilogram per day (mg/kg-day), are estimates of daily exposure levels for humans which are thought to be safe over a lifetime (including sensitive individuals). Estimated intakes of chemicals from environmental media (*e.g.*, the amount of a chemical incidentally ingested from contaminated soil) are compared to the RfD to derive the hazard quotient for the contaminant in the particular medium. The HI is derived by adding the hazard quotients for all compounds within a particular medium that impacts a particular receptor population.

An HI greater than 1 indicates that the potential exists for noncarcinogenic health effects to occur as a result of Site-related exposures. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media. The toxicity values, including reference doses, for TCE, are presented in Table 29. For both exposure to soils at the Cattaraugus Cutlery Area and in groundwater used as process water in washdown and commercial car wash scenarios, noncarcinogenic HI values were within EPA's acceptable limits.

Potential carcinogenic risks were evaluated using the cancer slope factors developed by EPA for TCE. Cancer slope factors (SFs) have been developed for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. SFs, which are expressed in units of $(mg/kg\text{-}day)^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to generate an upper-bound estimate of the excess lifetime cancer risk associated with exposure to the compound at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the SF. Use of this approach makes the underestimation of the risk highly unlikely. The SF used in this risk assessment for TCE is presented in Table 30.

For known or suspected carcinogens, EPA considers excess upper-bound individual lifetime cancer risks of between 10^{-4} to 10^{-6} to be acceptable. This level indicates that an individual has not greater than approximately a one in ten thousand to one in one million chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year period under specific exposure conditions at a site. Excess lifetime cancer risks estimated at this site are presented in Table 31. The excess lifetime cancer risk for future commercial workers exposed to TCE in groundwater used as process water in a washdown scenario is 2.6×10^{-4}, while the risk is 2.5×10^{-3} for future commercial workers exposed to TCE in groundwater used as a process water in a commercial car wash scenario. Future workers at the Cattaraugus Cutlery Area exposed to TCE in soils are estimated to have an excess lifetime cancer risk of 7.6×10^{-4}. All of these are above the acceptable risk range. The calculations were based on reasonable maximum exposure scenarios. These estimates were developed by taking into account various conservative assumptions about the likelihood of a person being exposed to these media.

TCE in the groundwater is a contaminant of potential concern for soil vapor migration from groundwater to indoor air, based on groundwater concentrations exceeding the health-based screening criteria of 5.3 μg/L. This value, which represents a cancer risk of 1×10^{-4}, is based upon EPA's 2002 *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils*.

Since point-of-use treatment systems have been installed on all of the affected drinking water wells, there is no current unacceptable risk associated with exposure to the contaminated groundwater from these wells.

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis;
- environmental parameter measurement;
- fate and transport modeling;
- exposure parameter estimation; and
- toxicological data.

Uncertainty in environmental sampling arises, in part, from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources, including the errors inherent in the sampling and analytical methods and characteristics of the matrix being sampled.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the contaminant of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the contaminants of concern at the point of exposure. One component of the exposure assessment which is likely to be associated with uncertainty is the evaluation of exposure to groundwater used as a process water in both the car wash and the washdown scenarios. The exposure parameters and models used in these evaluations are assumptions that are likely to be conservative estimates of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the baseline human health risk assessment provides upper-bound estimates of the risks to populations at and near the sites, and it is highly unlikely to underestimate actual risks related to the sites. There is uncertainty associated with the toxicity information for TCE. The cancer slope factor is being reviewed by EPA's Integrated Risk Information System program and some studies currently being evaluated through this effort have suggested that TCE may be more potent of a carcinogen that considered in this evaluation. However, it must be noted that this evaluation demonstrated that exposure to TCE would result in an unacceptable level of carcinogenic risk.

Specifically, several aspects of risk estimation contribute uncertainty to the projected risks. EPA recommends that an arithmetic average concentration of the data be used for evaluating long-term exposure and that, because of the uncertainty associated with estimating the true average concentration at a site, the 95 percent upper confidence limit (UCL)[14] on the arithmetic average be used as the exposure point concentration. The 95 percent UCL provides reasonable confidence that the true average will not be underestimated. Exposure point concentrations were calculated from residential, monitoring well, surface water and sediment sample data sets to represent the reasonable maximum exposure to various current and future populations. Uncertainty associated with sample laboratory analysis and data evaluation is considered low as a result of quality assurance and data validation.

In addition to the calculation of exposure point concentrations, several Site-specific assumptions regarding future land use scenarios, intake parameters, and exposure pathways are a part of the exposure assessment stage of a baseline risk assessment. Assumptions were based on Site-specific conditions to the greatest degree possible, and default parameter values found in EPA risk assessment guidance documents were used in the absence of Site-specific data. However, there remains some uncertainty in the prediction of future use scenarios and their associated intake parameters and exposure pathways. The exposure pathways selected for current scenarios were based on the Site conceptual model and related RI data. The uncertainty associated with the selected pathways for these scenarios is low because Site conditions support the conceptual model.

Standard dose conversion factors, risk slope factors, and reference doses are used to estimate the carcinogenic risks and noncarcinogenic hazards associated with Site contaminants. The risk estimators used in this assessment are generally accepted by the scientific community as representing reasonable projections of the hazards associated with exposure to the various chemicals of potential concern.

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14 The UCL is the upper bound of a confidence interval around any calculated statistic, most typically an average. For example, the 95 percent confidence interval for an average is the range of values that will contain the true average (*i.e.*, the average of the full statistical population of all possible data) 95 percent of the time. EPA bases most risk estimates on the UCL of response data to avoid underestimating the true risk in the face of uncertainty.

Ecological Risk Assessment

A field-based qualitative benthic macroinvertebrate survey for the Little Valley Creek at the Cattaraugus Cutlery Area and an unnamed tributary to Little Valley Creek at the Bush Industries Area revealed the presence of a diverse benthic community in both water bodies. The communities did not display significant alterations in community structure in either area.

Surface water sampling associated with the Bush Industries and Cattaraugus Cutlery Areas revealed detections of TCE and TCE degradation products below corresponding ecoscreening benchmarks. Similarly, sediment sampling revealed low-level detections of TCE degradation products below corresponding ecoscreening values.

The Cattaraugus Cutlery Area was determined to have only limited value for ecological receptors, since only a small amount of terrestrial/wetland habitat (consisting of small isolated fragments of deciduous woodland or open field) exists. Soil sampling revealed detections of TCE in the surface soils exceeding ecological screening values. Since most of these detections were associated with the developed portions of the area (*i.e.*, not in the portions of the area supporting the limited wildlife habitat present), the risk posed to terrestrial ecological receptors by TCE in the surface soils is low.

Summary of Human Health and Ecological Risks

The risks presented in the human health risk assessment indicate that there is significant potential risk to commercial workers from direct exposure to contaminated soils in the Cattaraugus Cutlery Area and to commercial workers from exposure to contaminated groundwater used as process water or commercial car washes. These risk estimates are based on current reasonable maximum exposure scenarios and were developed by taking into account various conservative assumptions about the frequency and duration of an individual's exposure to the soil and groundwater, as well as the toxicity of TCE.

In addition, based on groundwater concentrations of TCE which exceed the health-based screening criteria, there is a potential risk of soil vapor migration from groundwater to the indoor air of homes and businesses located in the Site area.

Since point-of-use treatment systems have been installed on all of the affected drinking water wells, there is no current unacceptable risk associated with exposure to the contaminated groundwater from these wells.

The findings of the ecological risk assessment indicate that the potential risks to ecological receptors from TCE is expected to be low.

More specific information concerning public health and environmental risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the risk assessment report.

Basis for Action

Based upon the results of the RI and the risk assessment, EPA has determined that the response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), TBC guidance, and site-specific risk-based levels, as well as the risks defined in the risk assessment, the current and reasonably-anticipated future land use, and potential beneficial groundwater use.

The following RAOs were established for the Site:

- Minimize or eliminate TCE migration from contaminated soils to the groundwater;
- Minimize or eliminate any contaminant migration from contaminated soils and groundwater to indoor air;
- Restore groundwater to meet state and federal standards for TCE within a reasonable time frame; and
- Reduce or eliminate any direct contact or inhalation threat associated with TCE-contaminated soils and groundwater and any inhalation threat associated with soil vapor.

Soil cleanup objectives will be those established in the TAGM guidelines. Groundwater cleanup goals will be the more stringent of the state or federal promulgated standards.

DESCRIPTION OF ALTERNATIVES

CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective, comply with ARARs, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA §121(d), 42 U.S.C. §9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4).

As was noted previously, principal threat wastes are those source materials considered to be highly toxic and which present a significant risk to human health or the environment should exposure occur, or are highly mobile such that they generally cannot be reliably contained. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of alternatives using the remedy selection criteria which are described below. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element[15].

Detailed descriptions of the remedial alternatives for addressing the contamination associated with the Site can be found in the FS report. This document presents four soil remediation alternatives and four groundwater remediation alternatives. To facilitate the presentation and evaluation of these alternatives, the FS report alternatives were modified to formulate the remedial alternatives discussed below.

It should be noted that although the FS report evaluated *in-situ* chemical oxidation for treatment of the TCE-contaminated groundwater at the Site, this technology is not being considered in this Proposed Plan because it is very similar to the *in-situ* air sparging alternative evaluated in the FS report, which would cost significantly less to implement. It should also be noted that active remedial measures were not considered for the Site-wide groundwater plume[16] because there is already an overall downward trend of TCE contamination in the plume.

All of the property owners/renters with drinking water wells that are protected with point-of-use treatment units are aware of the fact that the groundwater they use is contaminated and should not be used without treatment. They are reminded of this on a periodic basis when NYSDEC collects samples from their wells and/or provides maintenance related to their individual point-of-use treatment units. Therefore, institutional controls to prevent human exposure to contaminated groundwater from these properties (until groundwater standards are met) are not necessary.

A number of institutional controls—notices, deed restrictions, contractual agreements, and informational devices (*e.g.*, notifications) were considered to further prevent human exposure to contaminated groundwater underlying the Bush Industries and Cattaraugus

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15 *A Guide to Principal Threat and Low Level Threat Wastes*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, 9380.3-06FS, November 1991.

16 The Site-wide groundwater plume consists of the eight-mile TCE groundwater plume, excluding the contaminated groundwater underlying the Bush Industries, Cattaraugus Cutlery, Great Triangle, and Ninth Street Landfill Areas.

Cutlery Areas until groundwater standards are met. Both Bush Industries and the facility located on the Cattaraugus Cutlery Area obtain potable water from the Public Water Supply of the Village of Little Valley. In addition, groundwater standards are expected to be achieved in these areas through natural attenuation in 10 years, and monitoring in these areas would allow for periodic inspections to determine whether groundwater is being used without treatment. Therefore, EPA concluded that notification of these property owners, in combination with the periodic inspections, would be sufficiently protective of public health until groundwater standards are achieved.

A number of institutional controls were also considered to prevent human exposure to contaminated groundwater underlying the undeveloped parcels within the Site. It was concluded that since groundwater standards are expected to be achieved through natural attenuation in 10 years, periodic notification of local government agencies to remind them that if any unimproved parcel where the underlying groundwater is contaminated with TCE above the MCL is developed, the groundwater should not be used without treatment, would be sufficiently protective of public health until these standards are achieved.

For all of the groundwater alternatives, public health would continue to be protected with the point-of-use treatment units that were installed pursuant to the September1996 ROD for this Site.

The construction time for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate the performance of the remedy with any potentially responsible parties, or procure contracts for design and construction.

The remedial alternatives are described below.

Soil Remedial Alternatives

Alternative S-1: No Action

Capital Cost:	$0
Annual Operation and Maintenance Cost:	$0
Present-Worth Cost:	$0
Construction Time:	0 months

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative for soil does not include any physical remedial measures that address the problem of soil contamination at the Site.

Because this alternative would result in contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the contaminated soils.

Alternative S-2: Institutional Controls

Capital Cost:	$20,000
Annual Operation and Maintenance Cost:	$1,000
Present-Worth Cost:	$33,000
Construction Time:	6 months

This alternative involves the implementation of a public awareness program and institutional controls (the placement of limitations on the future use of the property) related to the Cattaraugus Cutlery Area.

The public awareness program would be directed toward on-property workers and residents in the vicinity of the Cattaraugus Cutlery Area, and would include the preparation and distribution of fact sheets and the convening of public meetings.

Under this alternative, institutional controls, such as a notice, deed restriction, or contractual agreement, would be used to prohibit the future use of the Cattaraugus Cutlery Area in a manner that would be inconsistent with on-property conditions (*e.g.*, prohibiting soil excavation activities).

The property would be inspected annually to determine whether soil excavation activities had occurred. If a notice or deed restriction were employed, property records would be searched annually to ensure that these controls are still in place. Local governmental offices, such as building and zoning offices, would be notified annually of the controls on the property and their records would also be reviewed annually to ascertain whether or not any applications or other filings had been made regarding the property. An annual report summarizing the findings of the above-noted activities would be prepared.

It is estimated that it would take six months to implement the institutional controls.

Because this alternative would result in contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the contaminated soils.

Alternative S-3: *In-Situ* Soil Vapor Extraction

Capital Cost:	$275,000
Annual Operation and Maintenance Cost:	$0
Present-Worth Cost:	$275,000
Construction Time:	12 months

Under this alternative, approximately 200 cubic yards of TCE-contaminated soil in the Cattaraugus Cutlery Area would be remediated by *in-situ* soil vapor extraction (ISVE). ISVE involves drawing air through a series of wells to volatilize the solvents in the soils. The extracted vapors would then be treated.

The exact configuration and number of vacuum extraction wells would be determined based on the results of a pilot-scale treatability study.

While the actual period of operation of the ISVE system would be based upon soil sampling results which demonstrate that the affected soils have been treated to soil TAGM objectives, it is estimated that the system would operate for a period of 12 months.

Alternative S-4: Excavation and Off-Site Treatment and/or Disposal

Capital Cost:	$136,000
Annual Operation and Maintenance Cost:	$0
Present-Worth Cost:	$136,000
Construction Time:	3 months

This alternative involves the excavation of approximately 200 cubic yards of TCE-contaminated soil to an estimated depth of four feet in two areas of the Cattaraugus Cutlery Area. The actual extent of the excavation and the volume of the excavated soil would be based on pre- and post-excavation confirmatory sampling. Shoring of the excavated areas and extraction and treatment of any water that enters the excavated area may be necessary.

The excavated areas would be backfilled with clean fill. All excavated material would be characterized and transported for treatment and/or disposal at an off-Site facility in compliance with the Resource Conservation and Recovery Act (RCRA).

It is estimated that this effort could be completed in three months.

Groundwater Remedial Alternatives

Alternative GW-1: No Action

Capital Cost:	$0
Annual Operation and Maintenance Cost:	$0
Present-Worth Cost:	$0
Construction Time:	0 months

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative would not include any physical remedial measures to address the groundwater contamination at the Site.

Based on the analysis of the groundwater data, it has been estimated that it would take ten years for the groundwater to be restored to drinking water quality under the no action alternative.

Because this alternative would result in contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented.

Alternative GW-2: Monitored Natural Attenuation of Source Areas and Site-Wide Groundwater Plume with Institutional Controls

Capital Cost:	$0
Annual Operation and Maintenance Cost:	$34,000
Present-Worth Cost:	$238,000
Construction Time:	1 month

Under this alternative, the contaminated groundwater underlying the Bush Industries, Cattaraugus Cutlery, Great Triangle, and Ninth Street Landfill Areas, as well as the Site-wide groundwater plume, would be addressed through natural attenuation, a variety of *in-situ* processes which, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. For this Site, these *in-situ* processes include dispersion, dilution, and adsorption; limited degradation may be occurring in select areas of the Site, particularly in the suspected source areas.

Groundwater samples would be collected and analyzed regularly in order to verify that the concentrations and the extent of groundwater contaminants are declining. The exact frequency and parameters of sampling would be determined during the design phase.

This alternative would also include institutional controls. Specifically, after an initial notification, NYSDEC, NYSDOH, and/or CCHD would periodically meet with or notify local governmental agencies to remind them that if any unimproved parcel where the underlying groundwater is contaminated with TCE above the MCL is developed, the groundwater should not be used without treatment. EPA would also notify the Bush Industries and Cattaraugus Cutlery Area property owners that the underlying groundwater is contaminated and should not be used without treatment. As part of EPA's natural attenuation monitoring at the Bush Industries and Cattaraugus Cutlery Areas, the properties would be inspected annually to verify that wells without treatment systems have not been installed. An annual report summarizing the results of the groundwater monitoring and the findings of such inspections would be prepared.

It is estimated that it would take 1 month to implement the institutional controls.

Based on the analysis of the groundwater data, it has been estimated that it would take ten years for the groundwater to be restored to drinking water quality.

Because this alternative would result in contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented.

Alternative GW-3: Source Area Extraction and Treatment and Site-Wide Groundwater Plume Monitored Natural Attenuation with Institutional Controls

Capital Cost:	$2,564,000
Annual Operation and Maintenance Cost:	$589,000
Present-Worth Cost:	$5,921,000
Construction Time:	6 months

This alternative is the same as Alternative GW-2, except instead of relying upon natural attenuation to address the contaminated groundwater underlying the Bush Industries and

Cattaraugus Cutlery Areas, the groundwater would be removed with extraction wells (two on the Bush Industries Area and two wells on the Cattaraugus Cutlery Area). The Great Triangle and Ninth Street Landfill Areas, as well as the Site-wide groundwater plume, would be addressed through monitored natural attenuation, as in Alternative GW-2.

The extracted groundwater would be collected, treated by air-stripping until achieving discharge standards, and discharged to the Little Valley Creek. Air stripping involves pumping untreated groundwater to the top of a "packed" column, which contains a specified amount of inert packing material. The column receives ambient air under pressure in an upward direction from the bottom of the column as the water flows downward, transferring volatile organic compounds (VOCs) to the air phase.

Based on the analysis of the groundwater data, it has been estimated that it would take eight years to remediate the groundwater at the Bush Industries and Cattaraugus Cutlery Areas using extraction and treatment. It has been estimated that it would also take eight years for the contaminated groundwater underlying the Great Triangle and Ninth Street Landfill Areas, as well as the Site-wide groundwater plume, to be restored to drinking water quality through natural attenuation.

Because this alternative would result in contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that the site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented.

Alternative GW-4: Source Area *In-Situ* Air Sparging and Site-Wide Groundwater Plume Natural Attenuation with Institutional Controls

Capital Cost:	$860,000
Annual Operation and Maintenance Cost:	$322,000
Present-Worth Cost:	$1,562,000
Construction Time:	6 months

This alternative is the same as Alternative GW-2, except instead of relying upon natural attenuation to address the contaminated groundwater underlying the Bush Industries and Cattaraugus Cutlery Areas, it would be treated with air sparging. The Great Triangle and Ninth Street Landfill Areas, as well as the Site-wide groundwater plume, would be addressed through monitored natural attenuation, as in Alternative GW-2.

In-situ air sparging involves injecting air, under pressure, into the aquifer via injection wells. Under this process, bubbles are formed from the injected air, which strip the VOCs from the groundwater. A vapor extraction system would be used to remove and treat the vapors generated. Performance and compliance monitoring and testing would be undertaken to assess the effectiveness of the *in-situ* air sparging system.

Based on the analysis of the groundwater data, it has been estimated that it would take two years to remediate the groundwater at the Bush Industries and Cattaraugus Cutlery Areas using air sparging. It has been estimated that it would take eight years for the contaminated groundwater underlying the Great Triangle and Ninth Street Landfill Areas, as well as the Site-wide groundwater plume, to be restored to drinking water quality through natural attenuation.

Because this alternative would result in contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented.

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, EPA considered the factors set out in CERCLA Section 121, 42 U.S.C. §9621, by conducting a detailed analysis of the viable remedial alternatives pursuant to the NCP, 40 CFR §300.430(e)(9), and OSWER Directive 9355.3-01 (*Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA: Interim Final*, EPA, October 1988). The detailed analysis consisted of an assessment of the individual alternatives against each of nine evaluation criteria and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

The following "threshold" criteria are the most important and must be satisfied by any alternative in order to be eligible for selection:

1. *Overall protection of human health and the environment* addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. *Compliance with ARARs* addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and regulations or provide grounds for invoking a waiver. Other federal or state advisories, criteria, or guidance are TBCs. TBCs are not required by the NCP, but may be very useful in determining what is protective of a site or how to carry out certain actions or requirements.

The following "primary balancing" criteria are used to make comparisons and to identify the major tradeoffs between alternatives:

3. *Long-Term effectiveness and permanence* refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. *Reduction of toxicity, mobility, or volume through treatment* is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.

5. *Short-term effectiveness* addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

6. *Implementability* is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. *Cost* includes estimated capital, O&M, and net present-worth costs.

The following "modifying" criteria are used in the final evaluation of the remedial alternatives after the formal comment period, and may prompt modification of the preferred remedy that was presented in the Proposed Plan:

8. *State acceptance* indicates whether, based on its review of the RI/FS report, RI/FS report addendum, and Proposed Plan, the State concurs with, opposes, or has no comments on the selected remedy.

9. *Community acceptance* refers to the public's general response to the alternatives described in the RI/FS report, RI/FS report addendum, and Proposed Plan.

A comparative analysis of these alternatives based upon the evaluation criteria noted above, follows.

Overall Protection of Human Health and the Environment

Alternatives S-1 and S-2 would not be protective of human health and the environment, since they would not actively address the contaminated soils, which present unacceptable risks of exposure and are a source of groundwater contamination. Alternatives S-3 and S-4 would be protective of human health and the environment, since each alternative relies upon a remedial strategy or treatment technology capable of eliminating human exposure and removing the source of groundwater contamination.

The analysis of the groundwater data indicate that Alternatives GW-1 and GW-2 would meet state and federal groundwater standards through natural attenuation in an estimated

10 years (after an active soil remedy is implemented). Alternative GW-2 is somewhat more protective of human health than Alternative GW-1 because groundwater monitoring would be performed and institutional controls would be implemented to prevent the installation and use of groundwater wells at the Bush Industries and Cattaraugus Cutlery Areas. Alternatives GW-3 and GW-4 would actively address the contaminants in the groundwater at the Bush Industries and Cattaraugus Cutlery Areas until concentrations are reduced to federal and state groundwater standards (estimated to be eight years and two years, respectively). It would take an estimated eight years to achieve the MCL in the Great Triangle and Ninth Street Landfill Areas, as well as the Site-wide groundwater plume, under these alternatives.

Although Alternatives GW-3 and GW-4 would be more protective of the environment than Alternatives GW-1 and GW-2 since MCLs would be reached sooner and would minimize the migration of contaminated groundwater, the groundwater is only marginally contaminated and there is no current direct contact risk of human exposure associated with the groundwater, since all of the affected wells have treatment systems installed. There may, however, be a potential inhalation risk posed by vapor migration from groundwater to indoor air. If vapor intrusion is determined to be a problem at the Site, this risk would need to be mitigated.

Until groundwater standards are met under Alternatives GW-2, GW-3, and GW-4, there would be a continued risk of human exposure to the contaminated groundwater. This risk would be mitigated by the continued use of the point-of-use treatment systems.

Compliance with ARARs

There are currently no federal or state promulgated standards for contaminant levels in soils. There are, however, other federal or state advisories, criteria, or guidance (TBCs), one of which is the New York State TAGM objectives. The soil cleanup objectives identified in NYSDEC's TAGM are either a human-health protection value or a value based on protection of groundwater (calculating the concentration in soil which would theoretically produce contaminant concentrations in the groundwater which would meet groundwater standards), whichever is more stringent. The TAGM is being used as the soil cleanup levels for the Site. The TAGM for TCE is 700 μg/kg, which falls within EPA's acceptable risk range.

Since the contaminated soils would not be addressed under Alternatives S-1 and S-2, they would not comply with the soil cleanup objectives. Alternatives S-3 and S-4 would attain the soil cleanup objectives specified in the TAGM.

Alternative S-4 would involve the excavation of contaminated soils and would, therefore, require compliance with fugitive dust and VOC emission regulations. In addition, this alternative would be subject to New York State and federal regulations related to the transportation and off-site treatment/disposal of wastes. In the case of Alternative S-3, compliance with air emission standards would be required for the ISVE system.

Specifically, treatment of off-gases would have to meet the substantive requirements of New York State Regulations for Prevention and Control of Air Contamination and Air Pollution (6 NYCRR Part 200, *et seq.*) and comply with the substantive requirements of other state and federal air emission standards.

EPA and NYSDEC have promulgated health-based protective MCLs (40 CFR Part 141, and 10 NYCRR, Chapter 1 and Part 5), which are enforceable standards for various drinking water contaminants (chemical-specific ARARs). The aquifer at the Site is classified as Class GA (6 NYCRR 701.18), meaning that it is designated as a potable water supply. Alternatives GW-1 and GW-2 do not include any active groundwater remediation; groundwater ARARs would be achieved through natural attenuation within an estimated ten years after the soil remedy is implemented. For Alternatives GW-3 and GW-4, ARARs would be achieved through the removal and *in-situ* treatment of contaminants in the groundwater at the two source areas, respectively, and through natural attenuation in the Great Triangle and Ninth Street Landfill Areas, as well as the Site-wide groundwater plume. Alternatives GW-3 and GW-4 would have to comply with surface water discharge requirements and the disposition of treatment residuals would have to be consistent with RCRA. Any air emissions associated with the treatment system would have to comply with air emission standards.

The requirements of New York State Environmental Conservation Law Section 27-1318, Institutional and Engineering Controls, would be applicable to the institutional controls included in Alternatives S-2, GW-2, GW-3, and GW-4.

Long-Term Effectiveness and Permanence

Alternatives S-1 and S-2 would involve no active remedial measures and, therefore, would not be effective in eliminating the potential exposure to contaminants in soil and would allow the continued migration of contaminants from the soil to the groundwater. Alternatives S-3 and S-4 would both be effective in the long term and would provide permanent remediation by either removing the contaminated soils from the Site or treating them in place.

Alternative S-3 would generate treatment residuals which would have to be appropriately handled. Alternatives S-1, S-2 and S-4 would not generate such residuals.

Once the source control remedy is implemented, it is anticipated that all of the groundwater alternatives would achieve groundwater ARARs within a reasonable time frame and would be effective in the long-term. It is anticipated that all of the alternatives would maintain reliable protection of human health and the environment over time.

Alternatives GW-3 and GW-4 would generate treatment residues which would have to be appropriately handled. Alternatives GW-1 and GW-2 would not.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternatives S-1 and S-2 would provide no reduction in toxicity, mobility or volume. Under Alternative S-3, the toxicity, mobility, and volume of contaminants would be reduced or eliminated through on-Site treatment. Under Alternative S-4, the toxicity, mobility, and volume of the contaminants would be eliminated by removing the contaminated soil from the property.

Alternatives GW-1 and GW-2 would rely solely upon natural attenuation to reduce the volume of groundwater contamination. Alternatives GW-3 and GW-4 would provide a reduction of toxicity, mobility, and volume of the contaminated groundwater through treatment of the contaminated groundwater at the Bush Industries and Cattaraugus Cutlery Areas. All of the groundwater alternatives would rely upon natural attenuation to address the groundwater contamination in the Great Triangle and Ninth Street Landfill Areas, as well as the Site-wide groundwater plume.

Short-Term Effectiveness

Alternatives S-1 and S-2 do not include any physical construction measures in any areas of contamination and, therefore, would not present any potential adverse impacts to on-property workers or the community as a result of its implementation. Alternative S-3 could result in some adverse impacts to on-property workers through dermal contact and inhalation related to the installation of ISVE wells through contaminated soils. Alternative S-4 could present some limited adverse impacts to on-property workers through dermal contact and inhalation related to excavation activities. Noise from the treatment unit and the excavation work associated with Alternatives S-3 and S-4, respectively, could present some limited adverse impacts to on-property workers and nearby residents. In addition, interim and post-remediation soil sampling activities would pose some risk. The risks to on-property workers and nearby residents under all of the alternatives could, however, be mitigated by following appropriate health and safety protocols, by exercising sound engineering practices, and by utilizing proper protective equipment.

Alternative S-4 would require the off-Site transport of contaminated soil (approximately 13 truck loads), which may pose the potential for traffic accidents, which in turn could result in releases of hazardous substances.

For Alternative S-4, there is a potential for increased stormwater runoff and erosion during construction and excavation activities that would have to be properly managed to prevent or minimize any adverse impacts. For this alternative, appropriate measures would have to be taken during excavation activities to prevent transport of fugitive dust and exposure of workers and downgradient receptors to VOCs.

Since no actions would be performed under Alternative S-1, there would be no implementation time. It is estimated that Alternative S-2 would be completed in six months. It is estimated that Alternative S-3 would require nine months to install the ISVE system and twelve months to achieve the soil cleanup objectives. It is estimated that it would take three months to excavate and transport the contaminated soils to an EPA-approved treatment/disposal facility under Alternative S-4.

Alternatives GW-1 and GW-2 do not include any active remediation; therefore, they would not present an additional risk to the community or workers resulting from activities at the Site. Alternatives GW-2, GW-3, and GW-4 would present some risk to on-property workers through dermal contact and inhalation from groundwater sampling activities, which could be minimized by utilizing proper protective equipment. Alternatives GW-3 and GW-4, which would require the installation of groundwater extraction or air sparging injection wells through potentially contaminated soils and groundwater, would present some risk to on-property workers through dermal contact and inhalation from construction and groundwater sampling activities. Noise from the treatment units associated with Alternatives GW-3 and GW-4 could present some limited adverse impacts to on-property workers and nearby residents. The risks to on-property workers and nearby residents under all of these alternatives could, however, be minimized by following appropriate health and safety protocols, exercising sound engineering practices, and utilizing proper protective equipment.

Since no actions would be performed under Alternative GW-1, there would be no implementation time. It is estimated that Alternative GW-2 would be completed in 1 month. It is estimated that Alternatives GW-3 and GW-4 would require 6 months to install the groundwater extraction and treatment system and *in-situ* treatment system, respectively.

Based upon the analysis of the groundwater data, it has been estimated that the contaminated groundwater would naturally attenuate to groundwater standards at the Bush Industries, Cattaraugus Cutlery, Great Triangle, and Ninth Street Landfill Areas, as well as the Site-wide groundwater plume in ten years (after an active soil remedy is implemented). By comparison, Alternative GW-3 would achieve groundwater standards at the Bush Industries, Cattaraugus Cutlery, Great Triangle, and Ninth Street Landfill Areas, as well as the Site-wide groundwater plume in an estimated eight years. Alternative GW-4 would achieve groundwater standards at the two source areas in an estimated two years; it would achieve groundwater standards in the Great Triangle and Ninth Street Landfill Areas, as well as the Site-wide groundwater plume in an estimated eight years.

The actual time period required for the groundwater to be remediated under all of the alternatives may vary from the estimates above and could be refined based on the results of groundwater monitoring and additional analysis of groundwater data.

Implementability

Alternatives S-1 and S-2 would be the easiest soil alternatives to implement, as there are no activities to undertake.

Both Alternatives S-3 and S-4 would employ technologies known to be reliable and that can be readily implemented. In addition, equipment, services, and materials needed for these alternatives are readily available, and the actions under these alternatives would be administratively feasible. Sufficient facilities are available for the treatment/disposal of the excavated materials under Alternative S-4.

Monitoring the effectiveness of the ISVE system under Alternative S-3 would be easily accomplished through soil and soil-vapor sampling and analysis. Under Alternative S-4, determining the extent of the soil cleanup could be easily accomplished through post-excavation soil sampling and analysis.

Alternative GW-1 would be the easiest groundwater alternative to implement, since it would require no activities. With the performance of institutional controls and monitoring, Alternative GW-2 would require more effort to implement than Alternative GW-1, but would be easily implemented. Alternative GW-3 (groundwater extraction and treatment) would be the most difficult to implement in that it would require the construction of a groundwater extraction system and pipelines. The services and materials that would be required for the implementation of all of the groundwater remedial alternatives are readily available.

All treatment equipment that would be used in Alternatives GW-3 and GW-4 are proven and commercially available. Transportation and disposal of treatment residues could be easily implemented using commercially-available equipment. Under these alternatives, sampling for treatment effectiveness and groundwater monitoring would be necessary, but could be easily implemented.

Cost

The estimated capital, operation and maintenance (O&M) (which includes monitoring), and present-worth costs for each of the alternatives are presented in the table, below.

Alternative	Capital	Annual O&M	Total Present-Worth
S-1	$0	$0	$0
S-2	$20,000	$1,000	$33,000
S-3	$275,000	$0	$275,000
S-4	$136,000	$0	$136,000
GW-1	$0	$0	$0
GW-2	$0	$34,000	$238,000
GW-3	$2,564,000	$589,000	$5,921,000
GW-4	$860,000	$322,000	$1,562,000

There are no annual O&M costs associated with the soil alternatives other than annual inspections and reviews related to the institutional controls associated with Alternative S-2. The present-worth cost associated with this alternative was calculated using a discount rate of seven percent and a 30-year time interval. The present-worth costs for the groundwater monitoring components of Alternatives GW-2, GW-3, and GW-4 were calculated using ten-, eight-, and eight-year time intervals, respectively. The present-worth costs for the remaining components of Alternatives GW-3 and GW-4 were calculated using eight-year (groundwater extraction and treatment) and two-year (*in-situ* air sparging) time intervals, respectively.

As can be seen by the cost estimates, Alternative S-1 is the least costly soil alternative at $0. Alternative S-3 is the most costly soil alternative at $275,000. The least costly groundwater alternative is GW-1 at $0. Alternative GW-3 is the most costly groundwater alternative at $5,921,000.

State Acceptance

NYSDEC concurs with the selected remedy; a letter of concurrence is attached (see Appendix IV).

Community Acceptance

Comments received during the public comment period indicate that the public generally supports the selected remedy. These comments are summarized and addressed in the Responsiveness Summary, which is attached as Appendix V to this document.

PRINCIPAL THREAT WASTE

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430 (a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for the migration of contamination to groundwater, surface water, or air, or act as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of alternatives, using the remedy selection criteria which are described below. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

TCE is present in the soil at the Cattaraugus Cutlery Area. This compound is highly mobile, cannot be reliably contained, and would present a significant risk to human health or the environment should exposure occur. Therefore, this compound constituents a principal threat waste.

Both Alternative S-3 (in-situ soil vapor extraction) and Alternative S-4 (excavation and off-Site treatment and/or disposal) would address source materials constituting principal threats by in-situ treatment or excavation and off-Site treatment and/or disposal, respectively. Therefore, both alternatives would satisfy the preference for treatment.

SELECTED REMEDY

Summary of the Rationale for the Selected Remedy

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternatives, and public comments, EPA has determined that Alternative S-4 (excavation and off-Site treatment and/or disposal) and Alternative GW-2 (monitored natural attenuation of source areas and Site-wide groundwater plume with institutional controls) best satisfy the requirements of CERCLA Section 121, 42 U.S.C. §9621, and provide the best balance of tradeoffs among the remedial alternatives with respect to the NCP's nine evaluation criteria, 40 CFR §300.430(e)(9). In addition, selection of monitored natural attenuation remedies anticipates a source removal element as a matter of EPA policy[17]. The selection of Alternative S-4 satisfies that policy with respect to Alternative GW-2.

While Alternatives S-3 and S-4 would both effectively achieve the 700 µg/kg soil cleanup objective, Alternative S-3 would be significantly more expensive and would take longer to construct and implement than Alternative S-4. Therefore, EPA and NYSDEC believe that Alternative S-4 would effectuate the soil cleanup while providing the best balance of tradeoffs with respect to the evaluating criteria.

While Alternative GW-2 would not actively treat the groundwater, there is currently no threat of exposure to contaminated groundwater at the Site, since point-of-use treatment systems have been installed on all of the affected drinking water wells. In addition, a review of the historical groundwater sample results from the Bush Industries Area show that natural attenuation is occurring. Although sample results from groundwater monitoring wells in the Cattaraugus Cutlery Area do not show a downward trend over time, it is expected that in combination with removing the sources of TCE from the soil in this area under Alternative S-4, TCE concentrations in the groundwater will naturally attenuate. Under Alternative GW-2, TCE levels are expected to attenuate to groundwater standards Site-wide in approximately ten years.

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[17] OSWER Directive 9200.4-17P, *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites*, EPA, April 1999.

While Alternatives GW-3 and GW-4 would actively treat the groundwater in the two source areas, thereby achieving groundwater standards in these areas in an estimated eight years and two years, respectively, these alternatives are significantly more costly to implement than Alternative GW-2.

Therefore, EPA and NYSDEC believe that Alternative GW-2 would minimize the migration of contaminated groundwater at the Site, while providing the best balance of tradeoffs among the alternatives with respect to the evaluation criteria.

The selected remedy is protective of human health and the environment, provides long-term effectiveness, will achieve the ARARs in a reasonable time frame, and is cost-effective. Therefore, the selected remedy will provide the best balance of tradeoffs among the alternatives with respect to the evaluation criteria. EPA and NYSDEC also believe that the selected remedy will treat principal threats and will utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

Summary of the Rationale for Continuing the Alternative Water Supply Remedy

The 1996 ROD provided for the installation of point-of-use treatment units on all of the affected and potentially affected private wells to ensure that drinking water standards were met. The ROD also called for an evaluation of the efficacy of the point-of-use treatment systems within five years of their installation, and a determination as to whether or not a more permanent system (such as a waterline) would be required. In the 2002 ESD, EPA determined that it would be more appropriate to evaluate the need for a permanent alternative water supply during the selection of a final remedy (*i.e.*, Operable Unit 2) for the Site.

Of the 91 private wells that have point-of-use treatment systems installed, 90 were sampled in October 2004. The results show that 49 of the wells are at or below the drinking water standard of 5 μg/L for TCE. Of the 41 wells that have contaminant levels exceeding the drinking water standard, the majority of these wells only marginally exceed 5 μg/L (32 wells have TCE levels between 6 μg/L and 10 μg/L). In addition, sampling results since 1989 indicate that there are decreasing levels of contaminants in all but a few wells; the highest concentration for the October 2004 sampling event was 22 μg/L, as compared to an historical high of 50 μg/L, and the median concentration is now 6.0 μg/L. Also, there is no current unacceptable direct contact risk associated with exposure to the groundwater, since point-of-use treatment systems have been installed on all of the affected drinking water wells.

Since the point-of-use treatment systems need to be operated until MCLs are reached, the costs related to the O&M of these systems are impacted by the duration of the various groundwater alternatives. The estimated annual O&M cost for the point-of-use treatment systems is $101,000. For the ten years of their operation while Alternative GW-2 is being implemented, the overall present-worth cost is $710,000, as compared to an overall present-worth cost of $605,000 for eight years of their operation under Alternatives GW-3 and GW-4. The estimated present-worth cost related to the construction, operation, and maintenance of a waterline ranges from $3.5 - $3.7 million.

Based on these findings, EPA and NYSDEC believe that public health should continue to be protected with the point-of-use treatment units that were installed pursuant to the 1996 remedy decision for this Site until groundwater standards are met (in approximately ten years) and that this is the final remedy for Operable Unit 1.

Description of the Selected Remedy

The major components of the selected remedy include the following:

- Excavation of approximately 200 cubic yards of TCE -contaminated soil exceeding the TAGM objective of 700 micrograms per kilogram to an estimated depth of four feet at two locations in the Cattaraugus Cutlery Area;

- Post-excavation confirmatory soil sampling;

- Backfilling of excavated areas with clean fill;

- Characterization and transportation of excavated material for treatment and/or disposal at an off-Site facility in compliance with the Resource Conservation and Recovery Act;

- Monitored natural attenuation of the TCE-contaminated groundwater underlying the Bush Industries, Cattaraugus Cutlery, Great Triangle, and Ninth Street Landfill Areas, as well as the Site-wide groundwater plume; and

- Periodic groundwater sample collection and analyses to verify that the contaminants are declining in concentration and in extent as a result of natural attenuation.

This alternative also includes institutional controls. Specifically, after an initial notification, NYSDEC, New York State Department of Health, and/or Cattaraugus County Health Department will periodically meet with or notify local governmental agencies to remind them that if any unimproved parcel where the underlying groundwater is contaminated with TCE above the Maximum Contaminant Level is developed, the groundwater should not be used without treatment. EPA will also notify the Bush Industries and Cattaraugus Cutlery Area property owners that the underlying groundwater is contaminated and should not be used without treatment. As part of EPA's natural attenuation monitoring on the Bush Industries and Cattaraugus Cutlery Areas, the properties will be inspected annually to verify that wells without treatment systems have not been installed. An annual report summarizing the results of the groundwater monitoring and the findings of such inspections will be prepared.

An evaluation of the potential for soil vapor intrusion into structures within the study area will be conducted; mitigation may be performed, if necessary.

In addition, until groundwater standards are met, public health will continue to be protected with the point-of-use treatment units that were installed pursuant to the 1996 interim remedy decision for drinking water at the Site. NYSDEC will continue to monitor the private wells and maintain the individual point-of-use treatment units until groundwater standards are met at the individual wells.

This remedy will result in the reduction of hazardous substances, pollutants, or contaminants to levels that will permit unlimited use of, and unrestricted exposure to, soil and groundwater in an estimated three months and 10 years, respectively. It is EPA's policy to conduct five-year reviews when remediation activities, including monitoring, will continue for more than five years. Therefore, under the selected remedy, EPA will continue to conduct five-year reviews at least once every five years. Because EPA conducted a five-year review for the alternate water supply interim remedy at this Site in May 2002, the next five-year review will be conducted on or before May 2007; it will be a Site-wide review.

Summary of the Estimated Remedy Costs

The estimated capital cost (there are no annual O&M costs) for the selected soil remedy is $136,000. The estimated capital, annual O&M and monitoring, and present-worth costs (using a 7% discount rate for a period of ten years) for the selected groundwater remedy are $0, $34,000, and $238,000, respectively[18]. Tables 32 and 33 provide the basis for the cost estimates for the selected soil and groundwater alternatives, respectively.

It should be noted that these cost estimates are order-of-magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual project cost. These cost estimates are based on the best available information regarding the anticipated scope of the selected remedy. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedy.

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[18] The point-of-use treatment systems need to be operated until MCLs are reached. The estimated annual O&M cost for the point-of-use treatment systems is $101,000. For the ten years of their operation while Alternative GW-2 is being implemented, the overall present-worth cost is $710,000. Therefore, the actual estimated capital, annual O&M and monitoring, and present-worth costs for the selected groundwater remedy are $0, $135,000, and $948,000, respectively.

Expected Outcomes of the Selected Remedy

The results of the risk assessment indicate that the Site, if left unremediated, may present an unacceptable risk to commercial workers from direct exposure to contaminated soils in the Cattaraugus Cutlery Area and to commercial workers from exposure to contaminated groundwater used as process water or commercial car washes. In addition, because there is a potential risk related to soil vapor migration from groundwater to indoor air of homes and businesses, EPA will evaluate the potential for soil vapor intrusion into structures within the study area; mitigation may be performed, if necessary.

The selected remedy will allow the following potential land and groundwater use:

Land Use

The Cattaraugus Cutlery Area is currently zoned for industrial use and has been used for commercial and industrial purposes since it was constructed. Should the use change, the cleanup levels would still be protective. Achieving the soil clean up levels will expand the area of the property available for beneficial use.

The TCE groundwater plume, which comprises the boundaries of the Site, extends approximately eight miles southeastward from the Village of Little Valley through the Town of Little Valley to the northern edge of the City of Salamanca. The Site is located in a rural, agricultural area, with a number of small, active and inactive industries and over 200 residential properties situated in the study area. With the exception of the Cattaraugus Cutlery Area, as noted above, it is unlikely that Site-wide land use will be impacted as a result of the remedy.

Groundwater Use

Under the selected remedy, the excavation of the contaminated soils located in the Cattaraugus Cutlery Area, which will eliminate a source of groundwater contamination, in combination with natural attenuation of the contaminants in the groundwater, will result in the restoration of water quality in the aquifer. The selected remedy will also reduce human health risks. Since point-of-use treatment systems have been installed on all of the affected drinking water wells, there is no current unacceptable risk associated with exposure to the contaminated groundwater from these wells. Any drinking water wells that are installed as part of future development would require point-of-use treatment systems if the underlying groundwater is contaminated with TCE above the MCL. Therefore, it is not anticipated that achieving the TCE cleanup level will alter groundwater use in the future. Achieving the cleanup level Site-wide will, however, be beneficial to the aquifer.

Under the selected remedy, it is estimated that it will require three months to achieve the soil cleanup levels and ten years to achieve groundwater standards.

STATUTORY DETERMINATIONS

Under CERCLA Section 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at a site.

For the reasons discussed below, EPA has determined that the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy will be protective of human health and the environment in that the excavation of the contaminated soils will eliminate an unacceptable potential risk to commercial workers from direct exposure to contaminated soils in the Cattaraugus Cutlery Area. In addition, the excavation of the contaminated soils in combination with monitored natural attenuation will result in the restoration of water quality in the aquifer and will eliminate a potential source of the soil vapor migration to indoor air of homes and businesses.

Since point-of-use treatment systems have been installed on all of the affected drinking water wells, there is no current unacceptable risk associated with exposure to the contaminated groundwater from these wells. Any drinking water wells that are installed as part of future development would require point-of-use treatment systems if the underlying groundwater is contaminated with TCE above the MCL. While achieving the TCE cleanup level Site-wide will not alter groundwater use in the future, it will be beneficial to the aquifer.

The potential risks to ecological receptors from TCE are expected to be low.

The selected remedy will reduce exposure levels to protective ARAR levels or to within EPA's generally acceptable risk range of 10^{-4} to 10^{-6} for carcinogenic risk and below the HI of 1 for noncarcinogens in the soils and groundwater. The implementation of the selected remedy will not pose unacceptable short-term risks or cross-media impacts that cannot possibly be mitigated. The selected remedy will also provide overall protection by reducing the toxicity, mobility, and volume of contamination through the treatment of the contaminated soils.

Compliance with ARARs and Other Environmental Criteria

While there are currently no federal or state promulgated standards for contaminant levels in soils, there are other federal or state advisories, criteria, or guidance (TBCs), one of which is the New York State TAGM objectives. The soil cleanup objectives identified in

NYSDEC's TAGM are either a human-health protection value or a value based on protection of groundwater (calculating the concentration in soil which would theoretically produce contaminant concentrations in the groundwater which would meet groundwater standards), whichever is more stringent. The TAGM is being used as the soil cleanup levels for the Site. The TAGM for TCE is 700 µg/kg, which falls within EPA's acceptable risk range.

A summary of action-specific, chemical-specific, and location-specific ARARs, as well as TBCs, which will be complied with during implementation of the selected remedy, is presented below.

Action-Specific ARARs:

- National Ambient Air Quality Standards (40 CFR Part 50)
- National Emissions Standards for Hazardous Air Pollutants (40 CFR Parts 51, 52, and 60)
- 6 NYCRR Part 257, Air Quality Standards
- 6 NYCRR Part 200, New York State Regulations for Prevention and Control of Air Contamination and Air Pollution
- 6 NYCRR Part 376, Land Disposal Restrictions
- Resource Conservation and Recovery Act (42 U.S.C. § 6901, *et seq.*)

Chemical-Specific ARARs:

- Safe Drinking Water Act (SDWA) MCLs and nonzero MCL Goals (40 CFR Part 141)
- 6 NYCRR Parts 700-705 Groundwater and Surface Water Quality Regulations
- 10 NYCRR Part 5 State Sanitary Code

Location-Specific ARARs:

- National Historic Preservation Act
- Executive order 11988, Floodplain Management
- 40 CFR Part 6 Appendix A, Statement of Procedures on Floodplains Management and Wetlands Protection
- EPA's 1985 Statement of Policy on Floodplains/Wetlands Assessments for CERCLA Actions

Other Criteria, Advisories, or Guidance (TBCs):

- New York Guidelines for Soil Erosion and Sediment Control
- New York State Air Cleanup Criteria, January 1990
- SDWA Proposed MCLs and nonzero MCL Goals
- NYSDEC Technical and Operational Guidance Series 1.1.1, November 1991

- Soil cleanup levels specified in NYSDEC Technical Administrative Guidance Memorandum No. 94-HWR-4046
- NYSDEC Guidelines for the Control of Toxic Ambient Air Contaminants, DAR-1, November 12, 1997

Cost-Effectiveness

A cost-effective remedy is one whose costs are proportional to its overall effectiveness (NCP §300.430(f)(1)(ii)(D)). Overall effectiveness is based on the evaluations of: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Based on the comparison of overall effectiveness (discussed above) to cost, the selected remedy meets the statutory requirement that Superfund remedies be cost-effective in that it is the least-cost action alternative and will achieve the remediation goals in a reasonable time frame.

Each of the alternatives has undergone a detailed cost analysis. In that analysis, capital and annual O&M costs have been estimated and used to develop present-worth costs. In the present-worth cost analysis, annual O&M costs were calculated for the estimated life of an alternative using a 7% discount rate.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The selected remedy provides the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in NCP §300.430(f)(1)(i)(B), such that it represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the Site. In addition, the selected remedy provides significant protection of human health and the environment, provides long-term effectiveness, is able to achieve the ARARs more quickly as to the soil and as quickly as to the groundwater, as the other alternatives, and is cost-effective.

The soil component of the selected remedy will employ excavation, followed by off-Site treatment and/or disposal to reduce the toxicity, mobility, and volume of the contaminants in the soil source areas. The selected remedy will permanently address this soil contamination.

While the selected groundwater remedy will not actively treat the groundwater, there is an overall downward trend of TCE contamination in the groundwater plume and there is currently no threat of exposure to contaminated groundwater at the Site, since point-of-use treatment systems have been installed on all of the affected drinking water wells. In addition, a review of the historical groundwater sample results from the Bush Industries Area show that natural attenuation is occurring. Although sample results from groundwater monitoring wells in the Cattaraugus Cutlery Area do not show a downward trend over time, it is expected that in combination with removing the sources of TCE from the soil in this area under the selected soil remedy, TCE concentrations in the groundwater will begin to diminish. The selected groundwater remedy will provide a permanent remedy to reduce the toxicity, mobility, and volume of the contaminants in the groundwater.

Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment as a principal element is satisfied under the selected remedy in that all contaminated soil will likely be treated prior to disposal. Therefore, treatment will be used to reduce the toxicity, mobility, and volume of contamination and achieve cleanup levels.

Five-Year Review Requirements

The selected remedy will result in the reduction of hazardous substances, pollutants, or contaminants to levels that will permit unlimited use of, and unrestricted exposure to, soil and groundwater in an estimated three months and 10 years, respectively. It is EPA's policy to conduct five-year reviews when remediation activities, including monitoring, will continue for more than five years. Therefore, under the selected remedy, EPA will continue to conduct five-year reviews at least once every five years. Because EPA conducted a five-year review for the alternate water supply interim remedy at this Site in May 2002, the next five-year review will be conducted on or before May 2007; it will be a Site-wide review.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan, released for public comment on June 27, 2005, identified Alternative S-4, Excavation/Off-Site Disposal, and Alternative GW-2, Monitored Natural Attenuation of Source Areas and Site-Wide Groundwater Plume with Institutional Controls, as the preferred remedy to address the soil and groundwater, respectively. The Proposed Plan also proposed to continue to protect public health with the point-of-use treatment units that were installed. Based upon its review of the comments submitted during the public comment period, EPA determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate.

LITTLE VALLEY SUPERFUND SITE
ROD

APPENDIX I

FIGURES

SUMMARY OF FIGURES

FIGURE 1: LITTLE VALLEY SITE BOUNDARY MAP

FIGURE 2: POTENTIAL SOURCE AREAS INVESTIGATED

FIGURE 3: NINTH STREET LANDFILL AREA

FIGURE 4: BUSH INDUSTRIES AREA

FIGURE 5: CATTARAUGUS CUTLERY AREA

FIGURE 6: KING WINDOWS AREA

FIGURE 7: GREAT TRIANGLE AREA

FIGURE 8: WESTERN BURNT HOUSE AREA

FIGURE 9: ENVIROTECH DRUM STORAGE AREA

FIGURE 10: LUMINITE PLANT AREA

FIGURE 11: FIRST STREET AREA

FIGURE 12: WINSHIP CIRCLE/BAKER ROAD AREA

FIGURE 13: WHIG STREET AREA

FIGURE 14: NORTH AND SOUTH LUMINITE AREAS

FIGURE 15: STATE STREET AREA

FIGURE 16: RAILROAD AVENUE AREA

FIGURE 17: HISTORIC TCE SAMPLING RESULTS IN RESIDENTIAL WELLS

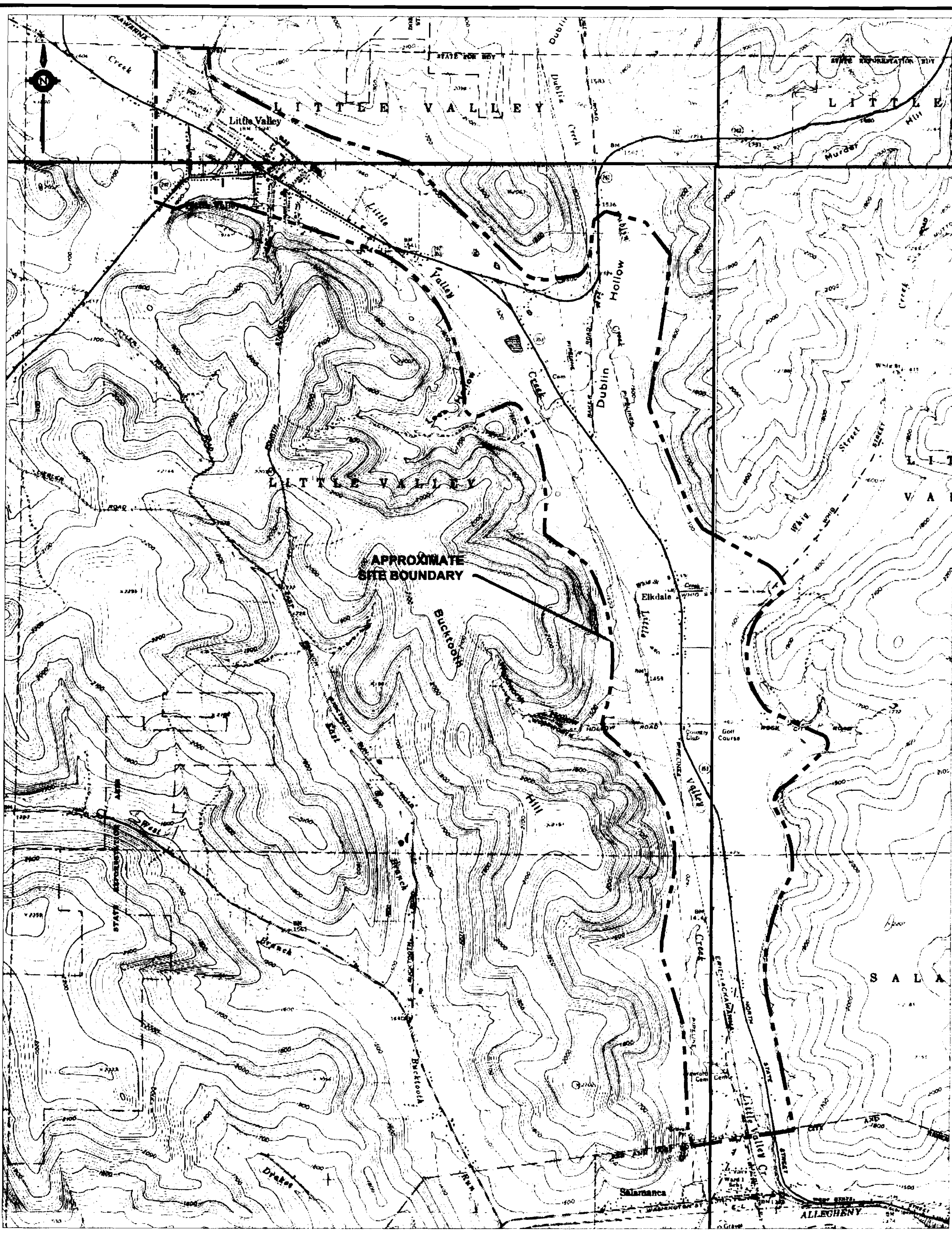
FIGURE 18: ISOCONCENTRATION CONTOUR OF TCE IN SOIL, CATTARAUGUS CUTLERY AREA

FIGURE 19: ISOCONCENTRATION CONTOUR OF TCE IN GROUNDWATER, CATTARAUGUS CUTLERY AREA

FIGURE 20: ISCONCENTRATION CONTOUR OF TCE IN GROUNDWATER, BUSH INDUSTRIES AREA

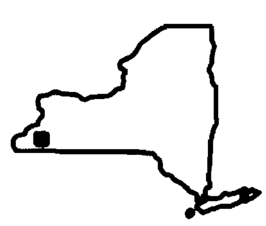
FIGURE 21: CONCEPTUAL SITE MODEL, CATTARAUGUS CUTLERY AREA

FIGURE 22: CONCEPTUAL SITE MODEL, BUSH INDUSTRIES AREA



0 3000 6000

GRAPHIC SCALE



APPROX. QUADRANGLE LOCATIONS

SOURCE:
BASE MAP ADAPTED FROM U.S.G.S. LITTLE VALLEY, ELLICOTTVILLE, SALAMANCA, AND CATTARAUGUS NEW YORK QUADRANGLES, 7.5 MINUTE SERIES (TOPOGRAPHIC).

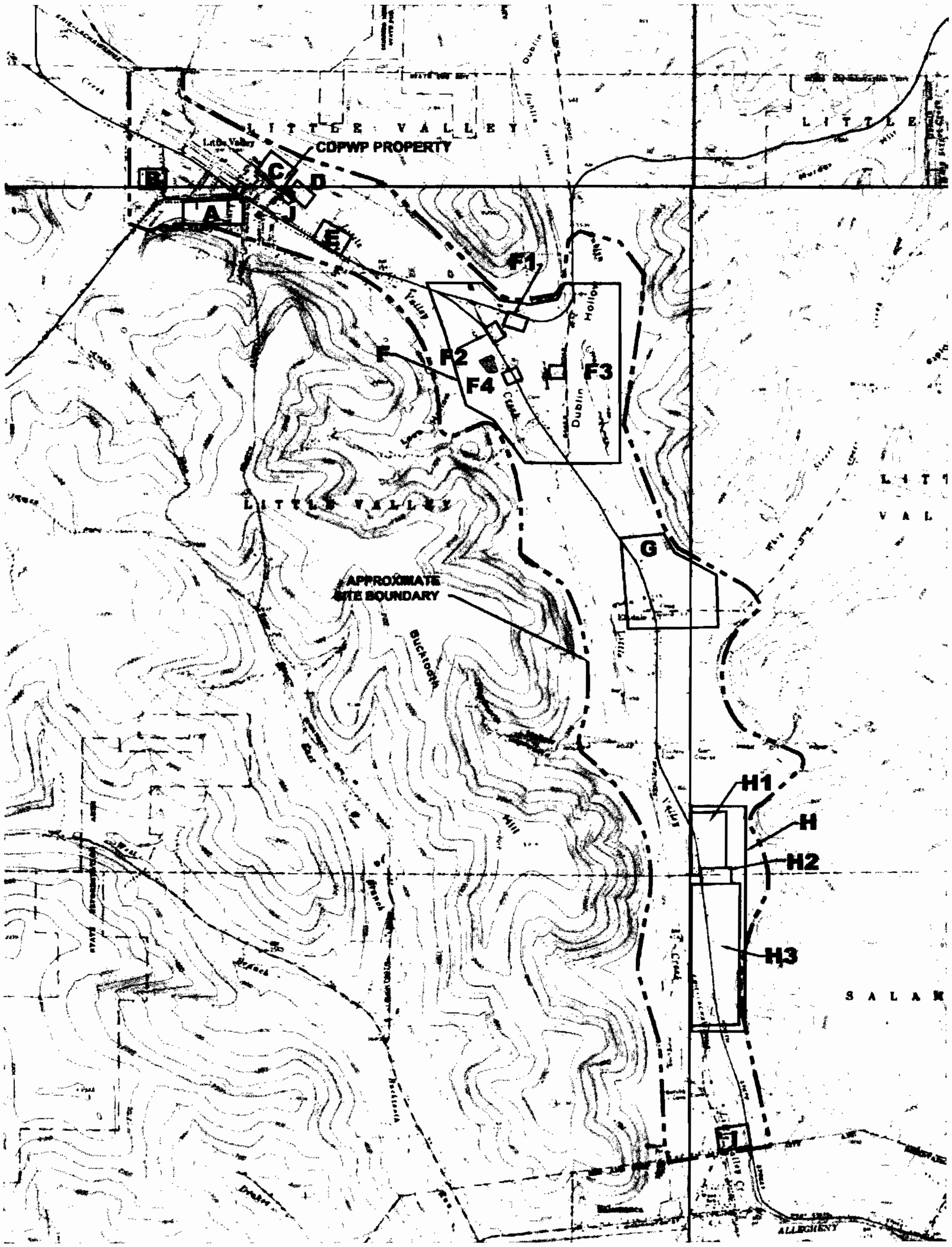
LITTLE VALLEY SUPERFUND SITE

LITTLE VALLEY
CATTARAUGUS COUNTY, NEW YORK

FIGURE 1
LITTLE VALLEY SITE BOUNDARY MAP

TETRA TECH FW, INC.

N:\GIS\DISNEY\DISPROJ31\EPA LITTLE VALLEY\RI ADDENDUM FIGURES\FIGURE 1-1 (SITE BOUNDARY).DWG



LEGEND:

NYSDEC POTENTIAL SOURCE AREAS:

- A BUSH INDUSTRIES AREA
- B NINTH STREET LANDFILL AREA
- C CATTARAUGUS CUTLERY AREA
- D KING WINDOWS (SECOND STREET) AREA
- E FIRST STREET AREA
- F GREAT TRIANGLE AREA
  - INCLUDES:
  - F1 ENVIROTECH DRUM STORAGE
  - F2 WESTERN BURNT HOUSE
  - F3 WINSHIP CIRCLE/BAKER ROAD
  - F4 TRIANGLE SOUTHWEST
- G WHIG STREET AREA
- H LUMINITE AREA
  - INCLUDES:
  - H1 NORTH LUMINITE
  - H2 LUMINITE PLANT AREA
  - H3 SOUTH LUMINITE
- I STATE STREET AREA
- J RAILROAD AVENUE AREA
- CDPWP CATTARAUGUS COUNTY DEPARTMENT OF PUBLIC WORKS PROPERTY

0 3000 6000

APPROXIMATE GRAPHIC SCALE

APPROX. QUADRANGLE LOCATIONS

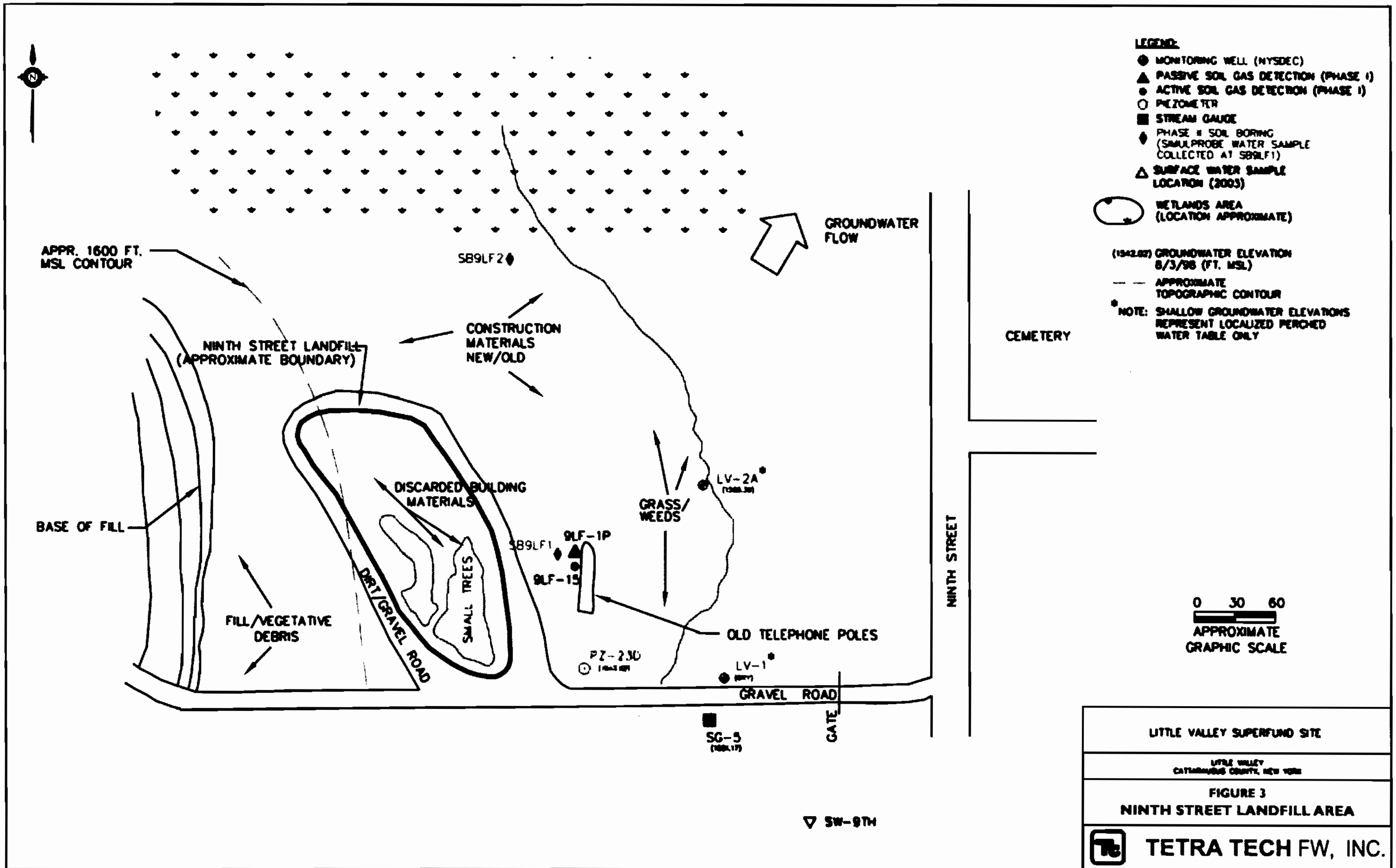
SOURCE:
BASE MAP ADAPTED FROM U.S.G.S. LITTLE VALLEY, ELLICOTTVILLE, SALAMANCA, AND CATTARAUGUS NEW YORK QUADRANGLES, 7.5 MINUTE SERIES (TOPOGRAPHIC).

LITTLE VALLEY SUPERFUND SITE

LITTLE VALLEY
CATTARAUGUS COUNTY, NEW YORK

FIGURE 2
INVESTIGATED POTENTIAL SOURCE AREAS

TETRA TECH FW, INC.

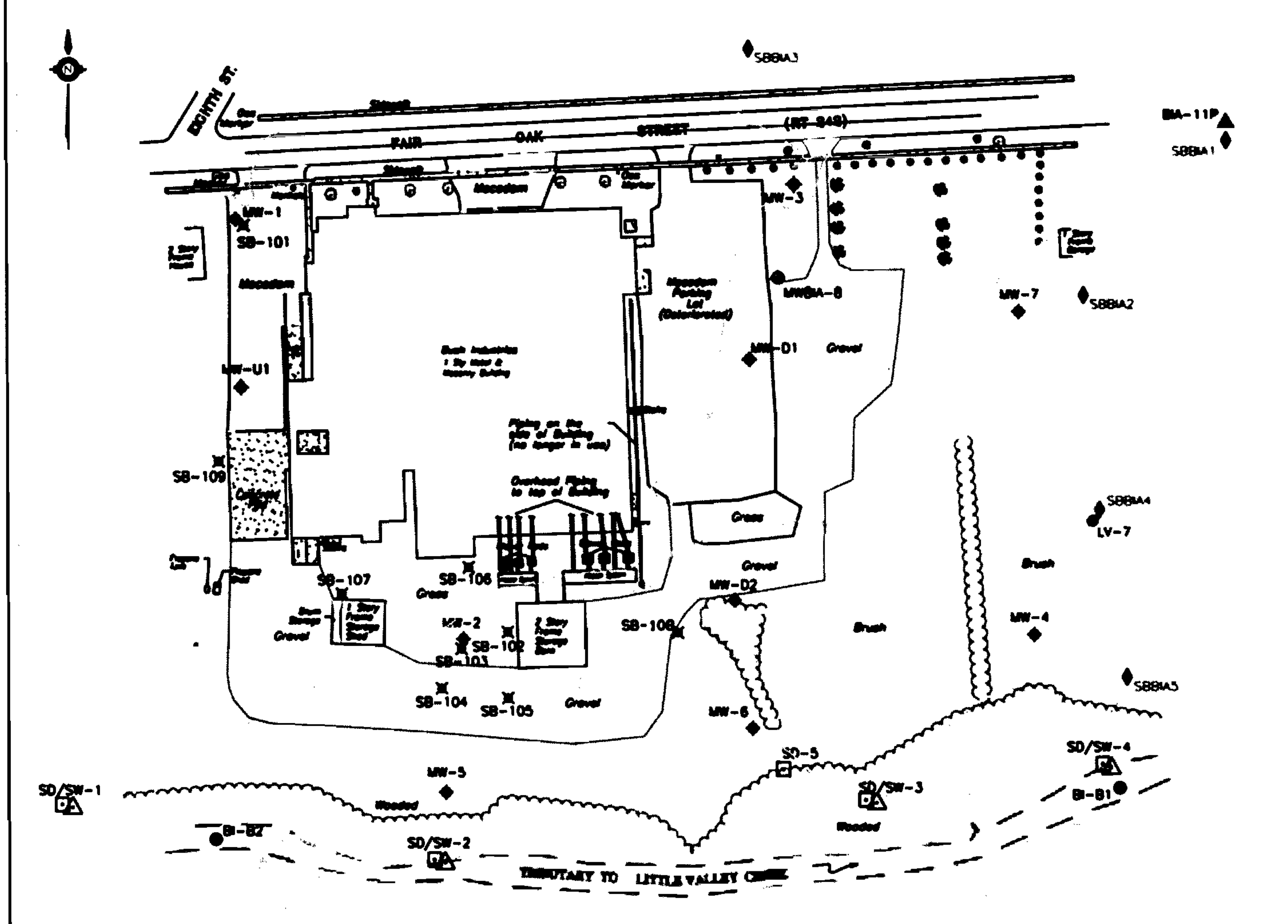


LITTLE VALLEY SUPERFUND SITE

LITTLE VALLEY
CATTARAUGUS COUNTY, NEW YORK

FIGURE 3
NINTH STREET LANDFILL AREA

TETRA TECH FW, INC.



LEGEND

- FIRE HYDRANT
- LIGHTPOLE
- UTILITY POLE
- SEDIMENT SAMPLE
- SURFACE WATER SAMPLE
- MONITORING WELL
- MONITORING WELL – PHASE III, 2000
- SOIL BORING, PHASE III (2000/2001)
- PHASE I SOIL GAS DETECTION (APPROXIMATE LOCATION)
- PHASE II SOIL BORING AND SIMULPROBE LOCATION (1998) (APPROXIMATE LOCATION)
- BENTHIC SAMPLE LOCATION–PHASE III (APPROXIMATE LOCATION)
- TREE
- PINE TREE
- CREEK BANK
- APPROX. TOPOGRAPHIC CONTOUR
- WOODS LINE
- MACADAM
- CONCRETE

NOTES:
1) MONITORING WELLS MW-1 THROUGH MW-7 WERE INSTALLED BY CONESTOGA ROVERS ASSOCIATES (CRA).
2) MONITORING WELLS MW-U1, MW-D1 AND MW-D2 WERE INSTALLED BY BUSH INDUSTRIES.
3) MONITORING WELLS LV-4 (NOT SHOWN) AND LV-7 WERE INSTALLED BY NYSDEC 1992.

0 100 200
APPROXIMATE GRAPHIC SCALE

SOURCE:
BASE MAP ADAPTED FROM TOPOGRAPHICAL MAP PREPARED BY VITILLO CORPORATION "TOPOGRAPHIC SURVEY OF BUSH INDUSTRIES SITE" DATED: 5/3/01 PLAN NUMBER E01003-F1

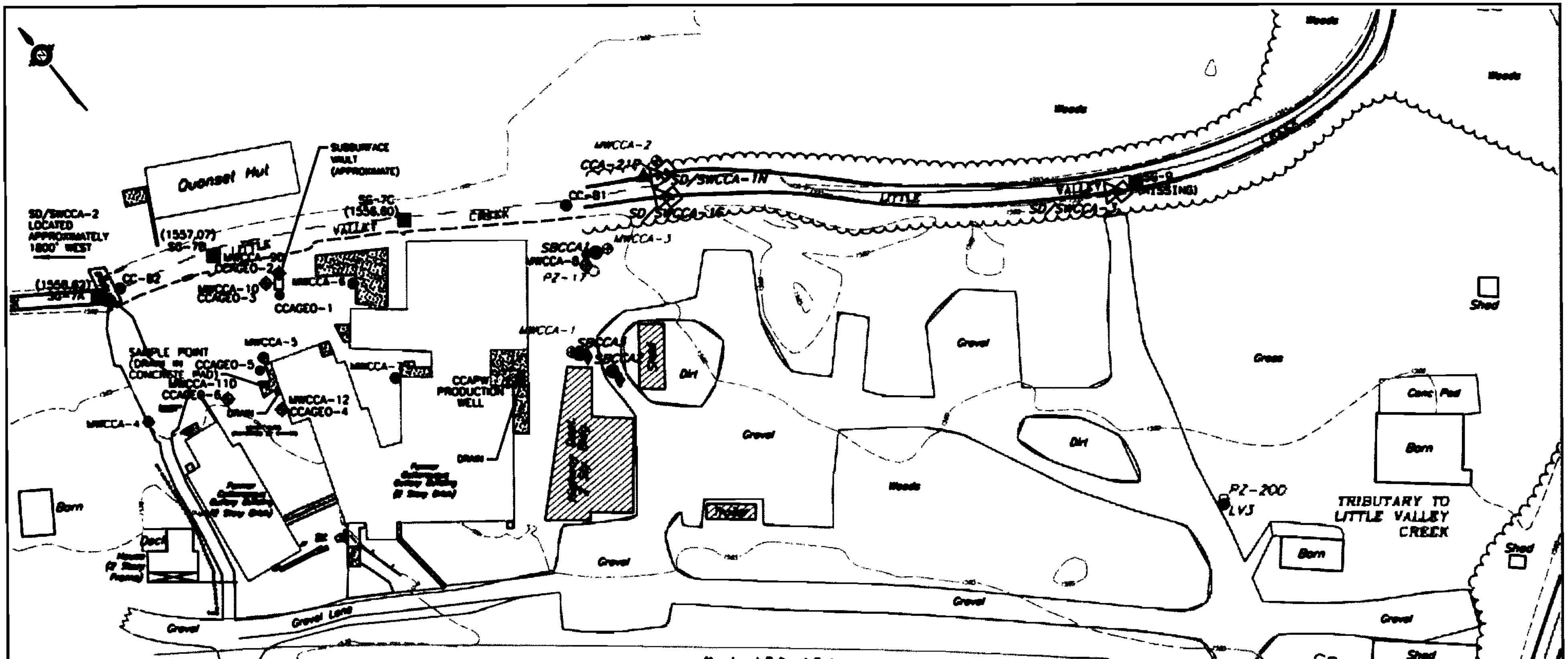
LITTLE VALLEY SUPERFUND SITE

LITTLE VALLEY
CATTARAUGUS COUNTY, NEW YORK

FIGURE 4
BUSH INDUSTRIES AREA

TETRA TECH FW, INC.

H:\DIS\DISNEY\DISPROJ31\EPA LITTLE VALLEY\FINAL III FIGURES\FIGURE 1-5 (BIA).DWG



LEGEND:

⊕	MONITORING WELL - PHASE II, 1998
●	MONITORING WELL (SOIL AND GROUNDWATER LOCATION) - PHASE II, 1998
⊕	MONITORING WELL - PHASE III, 2000*
⊕	MONITORING WELL AND DIRECT-PUSH LOCATION - PHASE IV, 2003
♦	PHASE II SOIL BORING AND SIMULPROBE LOCATION *
⊙	PIEZOMETER - PHASE I, 1997
⊕	PRODUCTION WELL*
●	PHASE IV DIRECT-PUSH LOCATION
▲	PASSIVE SOIL GAS DETECTION*
●	ACTIVE SOIL GAS DETECTION*
△	SURFACE WATER SAMPLE*
⊡	SEDIMENT SAMPLE
■	STREAM GAUGE
●	BENTHIC SAMPLE LOCATION-PHASE III (APPROXIMATE LOCATION)
(1554.36)	SURFACE WATER ELEVATION (FT. MSL) ON OCTOBER 28, 1999
	CONCRETE
	DEMOLISHED BUILDINGS

* LOCATIONS ARE APPROXIMATE

	ELEVATION	
PRODUCTION WELL (CCAPW)	1,564.50	TOP OF WELL

BASE MAP ADAPTED FROM TOPOGRAPHICAL MAP PREPARED BY VITILLO CORPORATION FINAL PLAN DATED: 11/19/99 REV. 1 PLAN NUMBER R97079-F1

THERE HAVE BEEN SIGNIFICANT CHANGES IN THE 1998 SURVEY AREA THAT ARE NOT SHOWN ON THIS PLAN, CONSISTING OF BUILDING DEMOLITION AND EARTH MOVING ACTIVITIES AS THE COUNTY VACATED THE PREMISES.

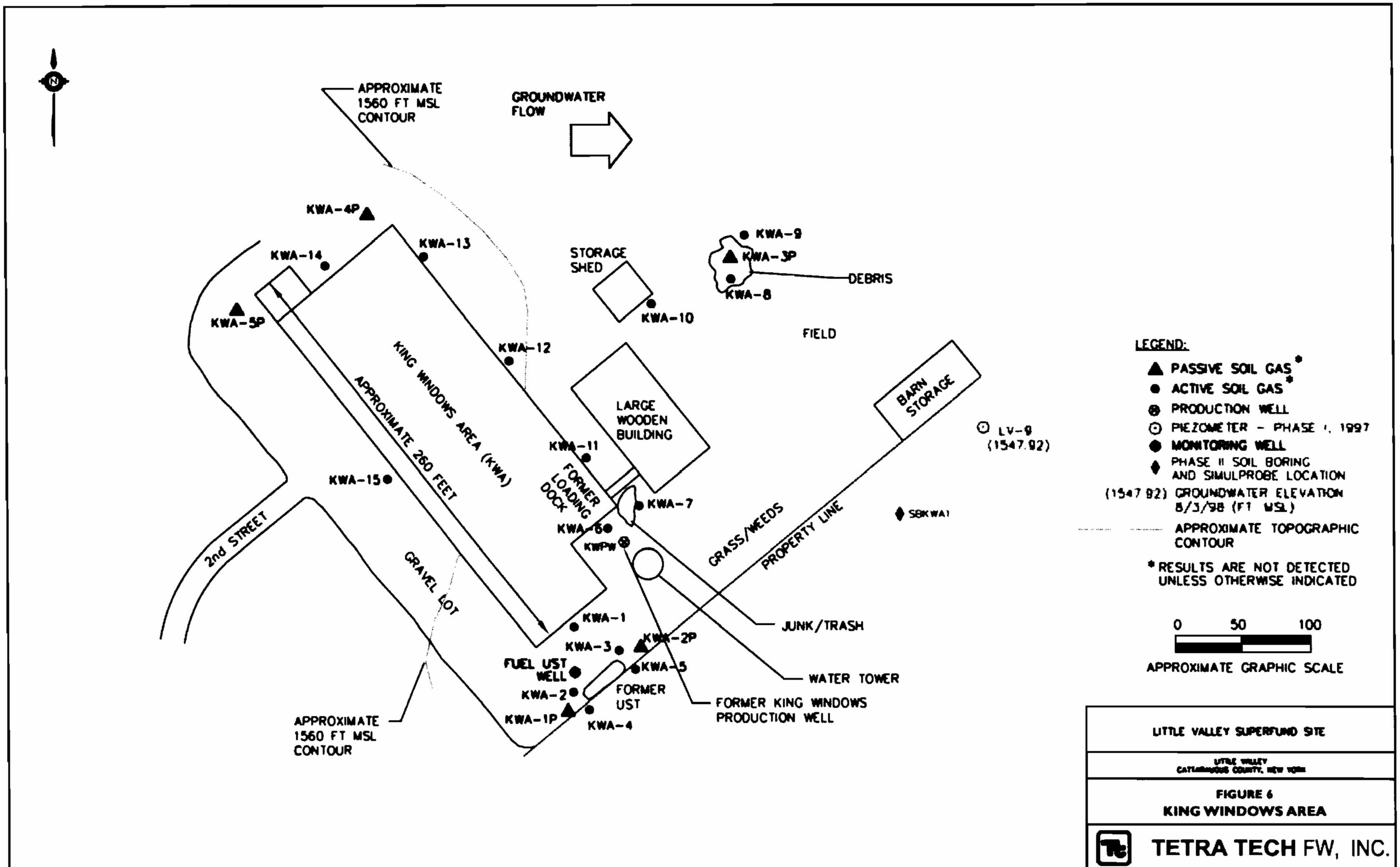
0 80 160
APPROXIMATE GRAPHIC SCALE

LITTLE VALLEY SUPERFUND SITE

LITTLE VALLEY
CATTARAUGUS COUNTY, NEW YORK

FIGURE 5
CATTARAUGUS CUTLERY AREA

TETRA TECH FW, INC.



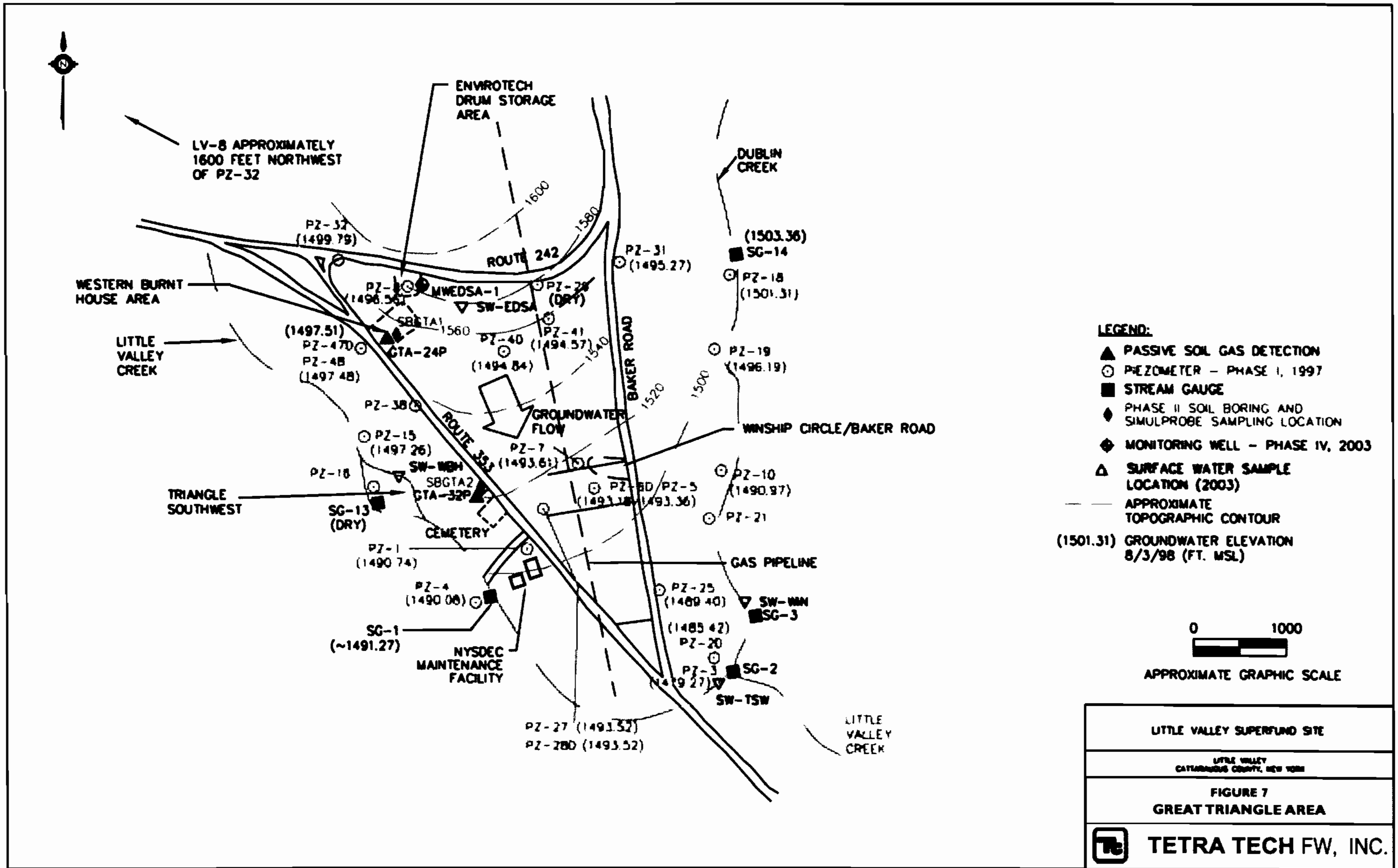
LITTLE VALLEY SUPERFUND SITE

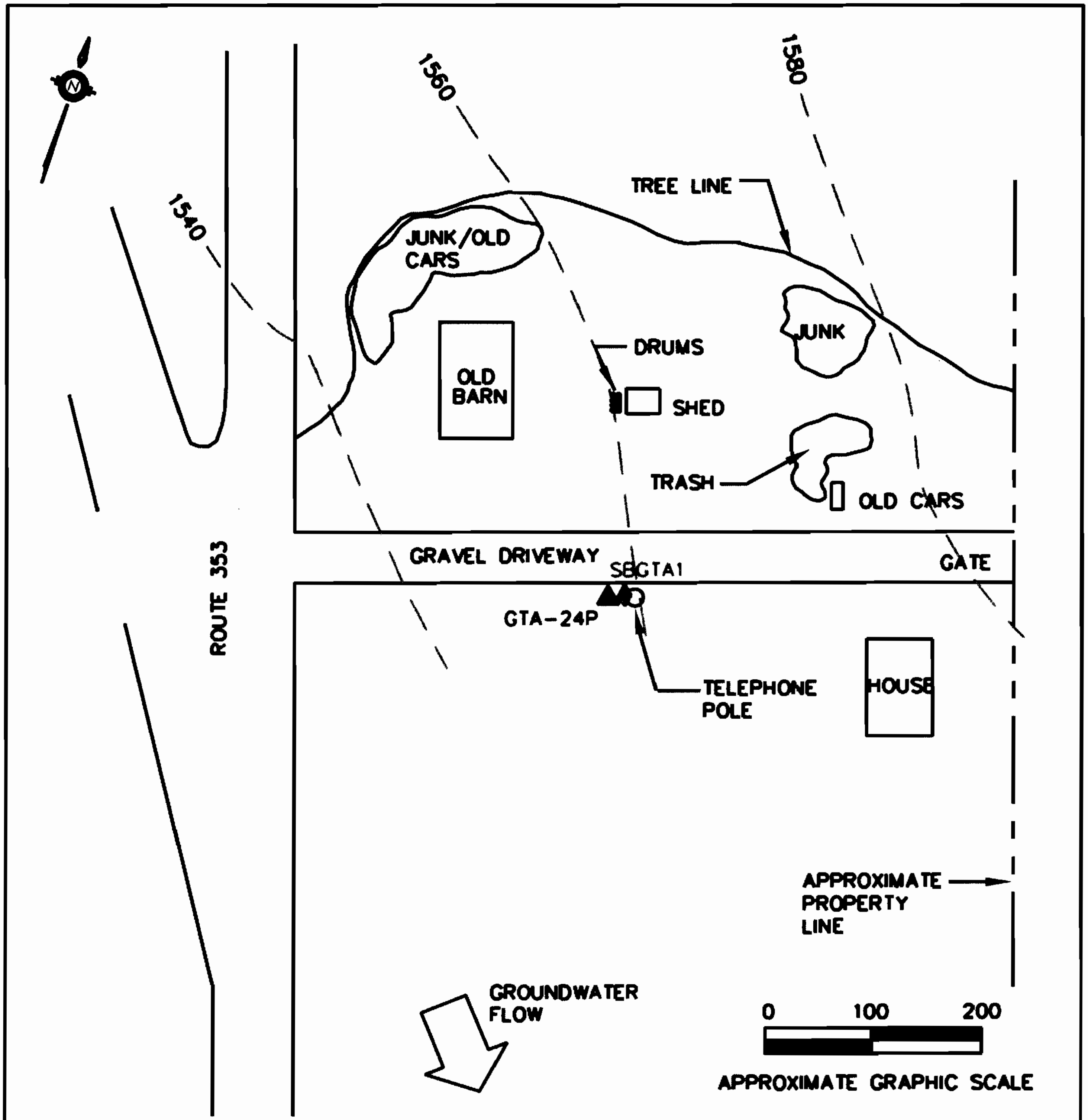
LITTLE VALLEY
CATTARAUGUS COUNTY, NEW YORK

FIGURE 6
KING WINDOWS AREA

TETRA TECH FW, INC.

H:\GIS\DISKEY\DISPROJ31\EPA LITTLE VALLEY\FINAL RI FIGURES\FIGURE 1-7 (KWA).DWG


ENVIROTECH DRUM STORAGE AREA
LV-8 APPROXIMATELY 1600 FEET NORTHWEST OF PZ-32
DUBLIN CREEK
WESTERN BURNT HOUSE AREA
LITTLE VALLEY CREEK
ROUTE 242
ROUTE 353
BAKER ROAD
GROUNDWATER FLOW
WINSHIP CIRCLE/BAKER ROAD
TRIANGLE SOUTHWEST
CEMETERY
GAS PIPELINE
NYSDEC MAINTENANCE FACILITY
PZ-32 (1499.79)
PZ-31 (1495.27)
(1503.36) SG-14
PZ-18 (1501.31)
PZ-19 (1496.19)
MWEDSA-1
SW-EDSA
PZ-29 (DRY)
PZ-41 (1494.57)
PZ-40 (1494.84)
SBGTA1
GTA-24P
(1497.51) PZ-47D
PZ-48 (1497.48)
PZ-38
PZ-15 (1497.26)
PZ-16
SW-WBH
SBGTA2
GTA-32P
SG-13 (DRY)
PZ-7 (1493.61)
PZ-5 (1493.36)
PZ-10 (1490.97)
PZ-21
PZ-1 (1490.74)
PZ-4 (1490.08)
SG-1 (~1491.27)
PZ-25 (1489.40)
SW-WN
SG-3
(1485.42) PZ-20
PZ-3
SG-2
SW-TSW
PZ-27 (1493.52)
PZ-28D (1493.52)
1600
1580
1560
1540
1520
1500
LEGEND:
PASSIVE SOIL GAS DETECTION
PIEZOMETER - PHASE I, 1997
STREAM GAUGE
PHASE II SOIL BORING AND SIMULPROBE SAMPLING LOCATION
MONITORING WELL - PHASE IV, 2003
SURFACE WATER SAMPLE LOCATION (2003)
APPROXIMATE TOPOGRAPHIC CONTOUR
(1501.31) GROUNDWATER ELEVATION 8/3/98 (FT. MSL)
0
1000
APPROXIMATE GRAPHIC SCALE
LITTLE VALLEY SUPERFUND SITE
LITTLE VALLEY
CATTARAUGUS COUNTY, NEW YORK
FIGURE 7
GREAT TRIANGLE AREA
TETRA TECH FW, INC.



LEGEND:

▲ PASSIVE SOIL GAS DETECTION

◆ PHASE II SOIL BORING AND SIMULPROBE SAMPLING LOCATION

GROUNDWATER ELEVATION 8/3/98 (FT. MSL)

— — APPROXIMATE TOPOGRAPHIC CONTOUR (FT MSL)

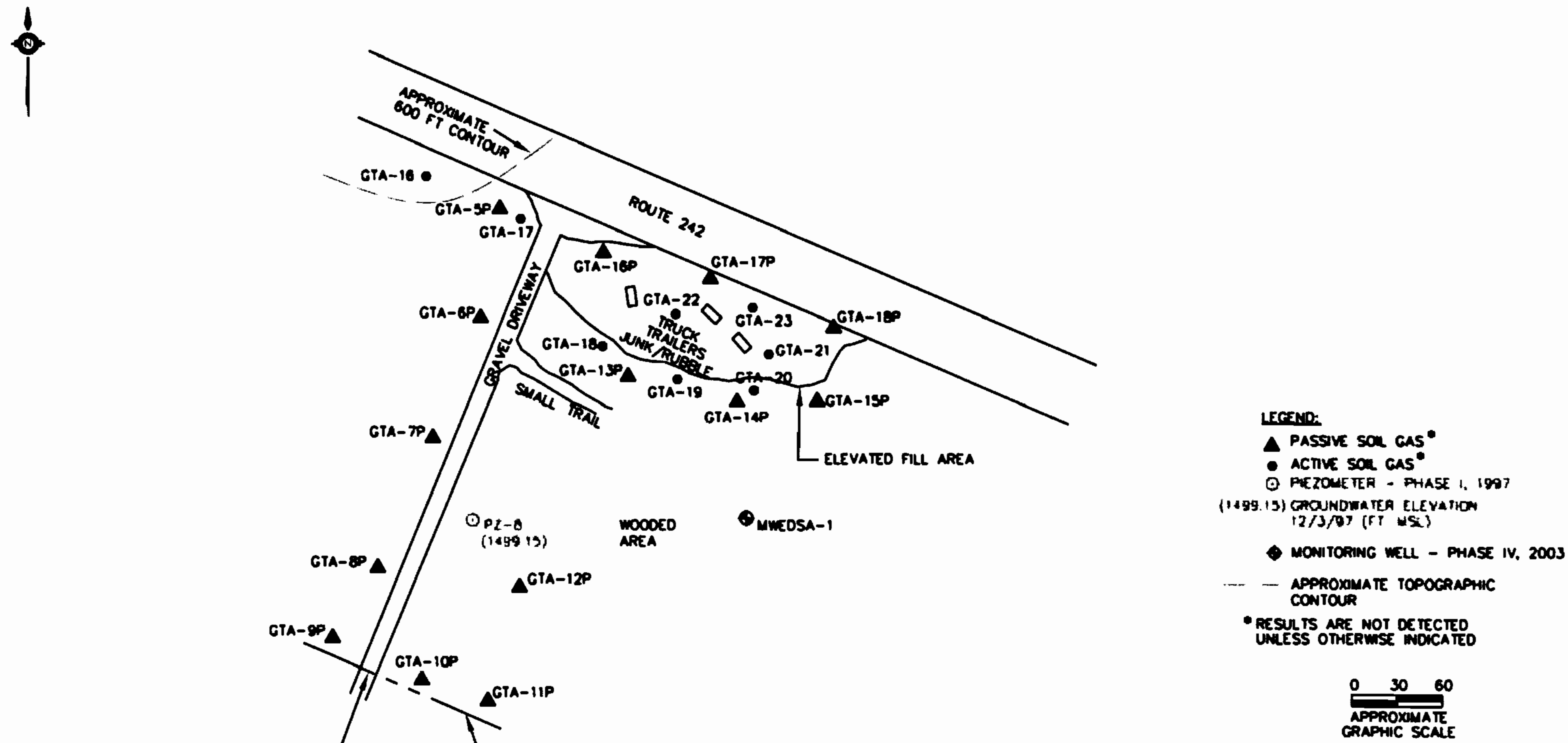
LITTLE VALLEY SUPERFUND SITE

LITTLE VALLEY
CATTARAUGUS COUNTY, NEW YORK

FIGURE 8
WESTERN BURNT HOUSE AREA

TETRA TECH FW, INC.

N:\GIS\GISKEY\GISPROJ31\EPA LITTLE VALLEY\FINAL RI FIGURES\FIGURE 1-9 (WBH).DWG

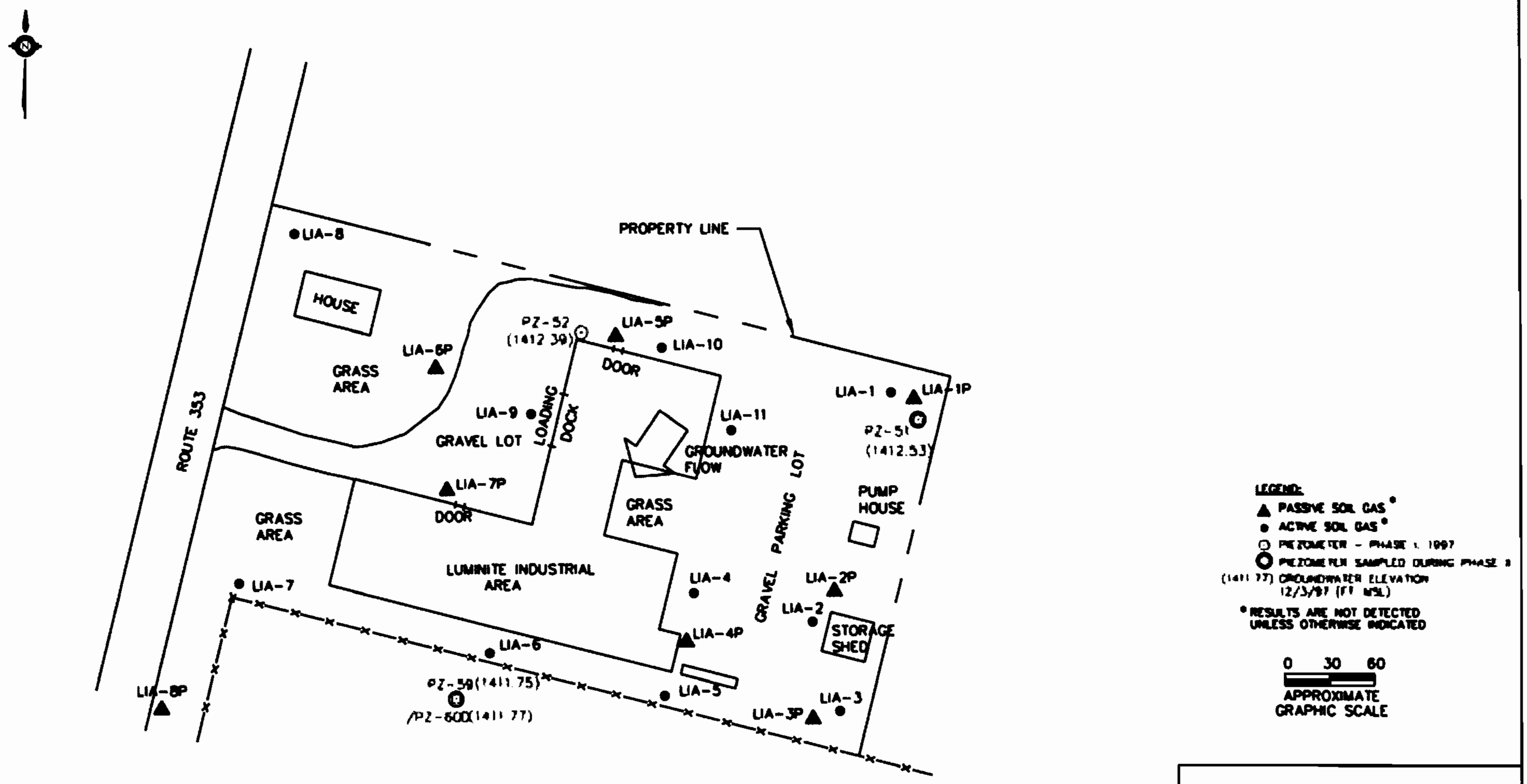


LITTLE VALLEY SUPERFUND SITE

LITTLE VALLEY
CATTARAUGUS COUNTY, NEW YORK

FIGURE 9
ENVIROTECH DRUM STORAGE AREA

TETRA TECH FW, INC.

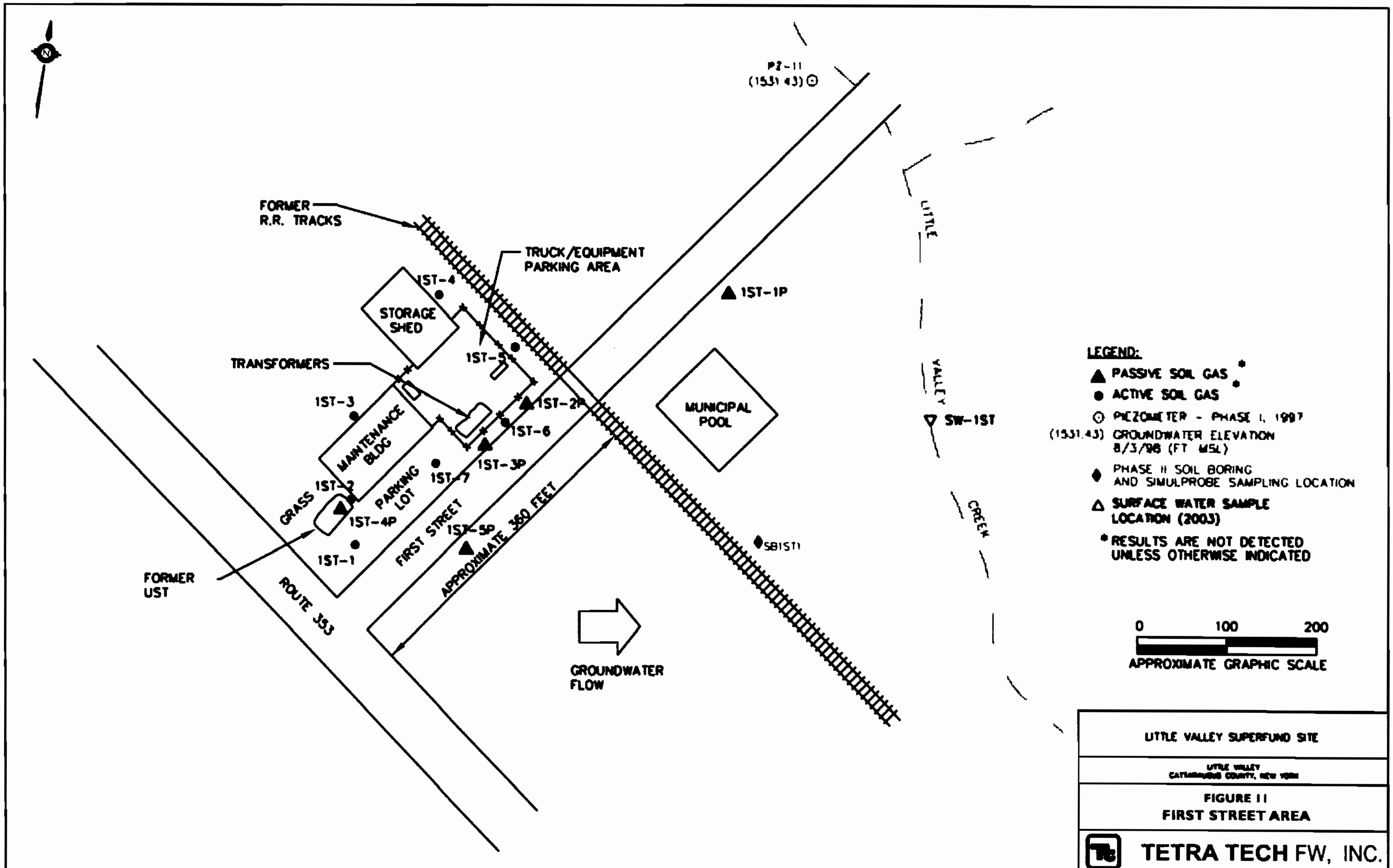


LITTLE VALLEY SUPERFUND SITE

LITTLE VALLEY
CATTARAUGUS COUNTY, NEW YORK

FIGURE 10
LUMINITE PLANT AREA

TETRA TECH FW, INC.



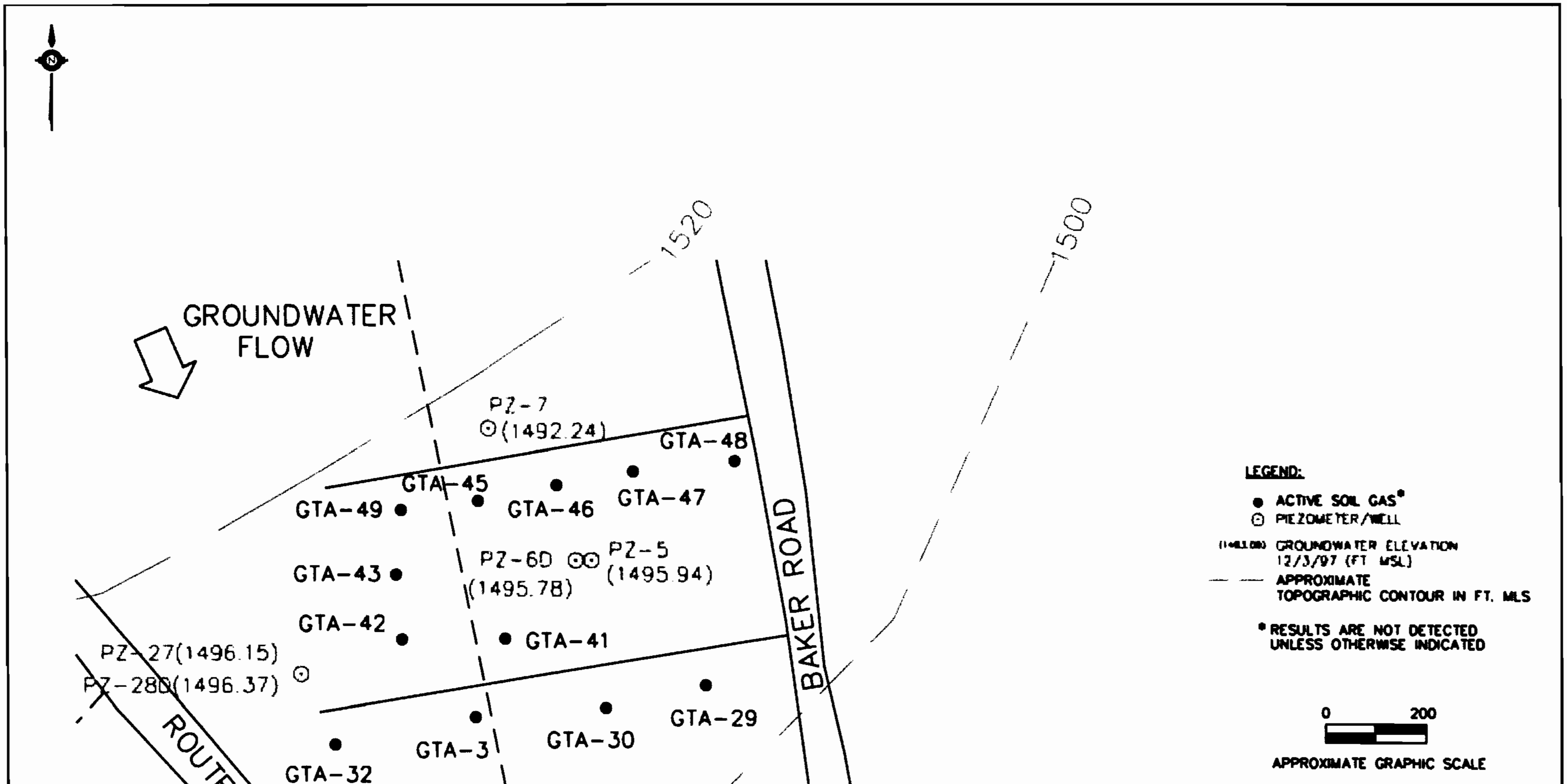
LITTLE VALLEY SUPERFUND SITE

LITTLE VALLEY
CATTARAUGUS COUNTY, NEW YORK

FIGURE 11
FIRST STREET AREA

TETRA TECH FW, INC.

H:\DIS\DISKEY\DISPROJ31\EPA LITTLE VALLEY\FINAL RI FIGURES\FIGURE 1-12 (1ST).DWG



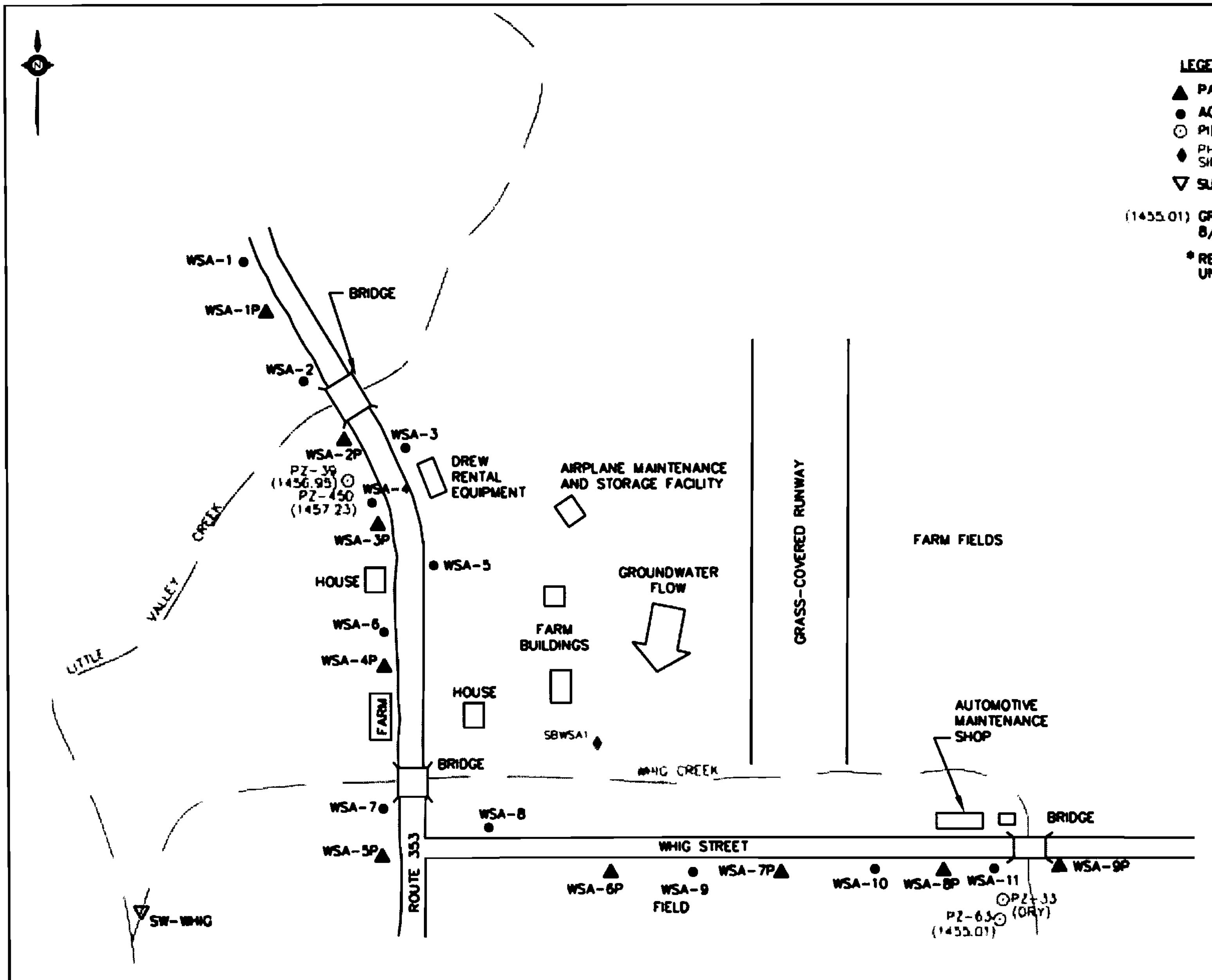
THIS DRAWING PRODUCED ON AUTOCAD
DO NOT REVISE IT MANUALLY

LITTLE VALLEY SUPERFUND SITE

LITTLE VALLEY
CATTARAUGUS COUNTY, NEW YORK

FIGURE 12
WINSHIP CIRCLE/BAKER ROAD AREA

TETRA TECH FW, INC.

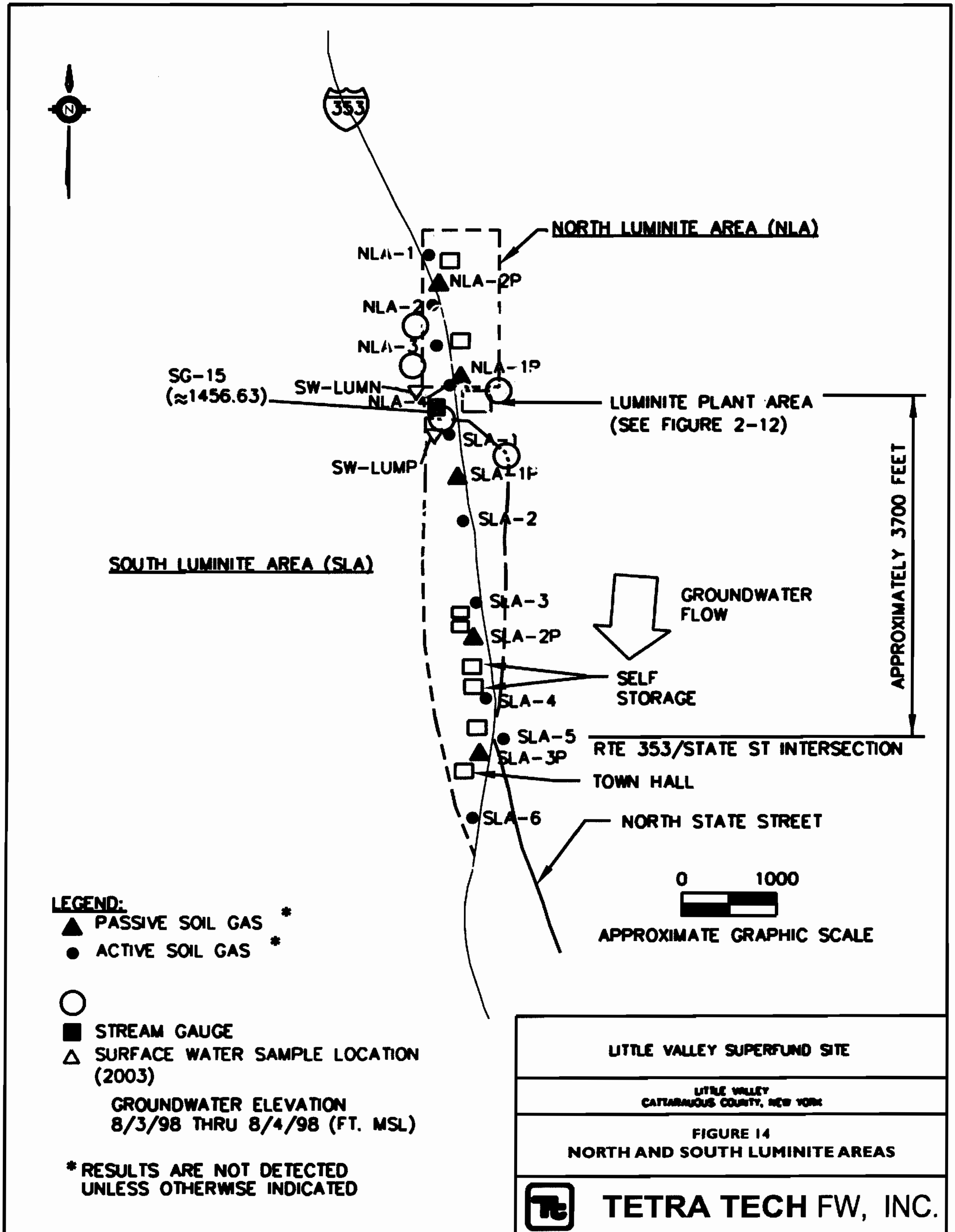


LITTLE VALLEY SUPERFUND SITE

LITTLE VALLEY
CATTARAUGUS COUNTY, NEW YORK

FIGURE 13
WHIG STREET AREA

TETRA TECH FW, INC.



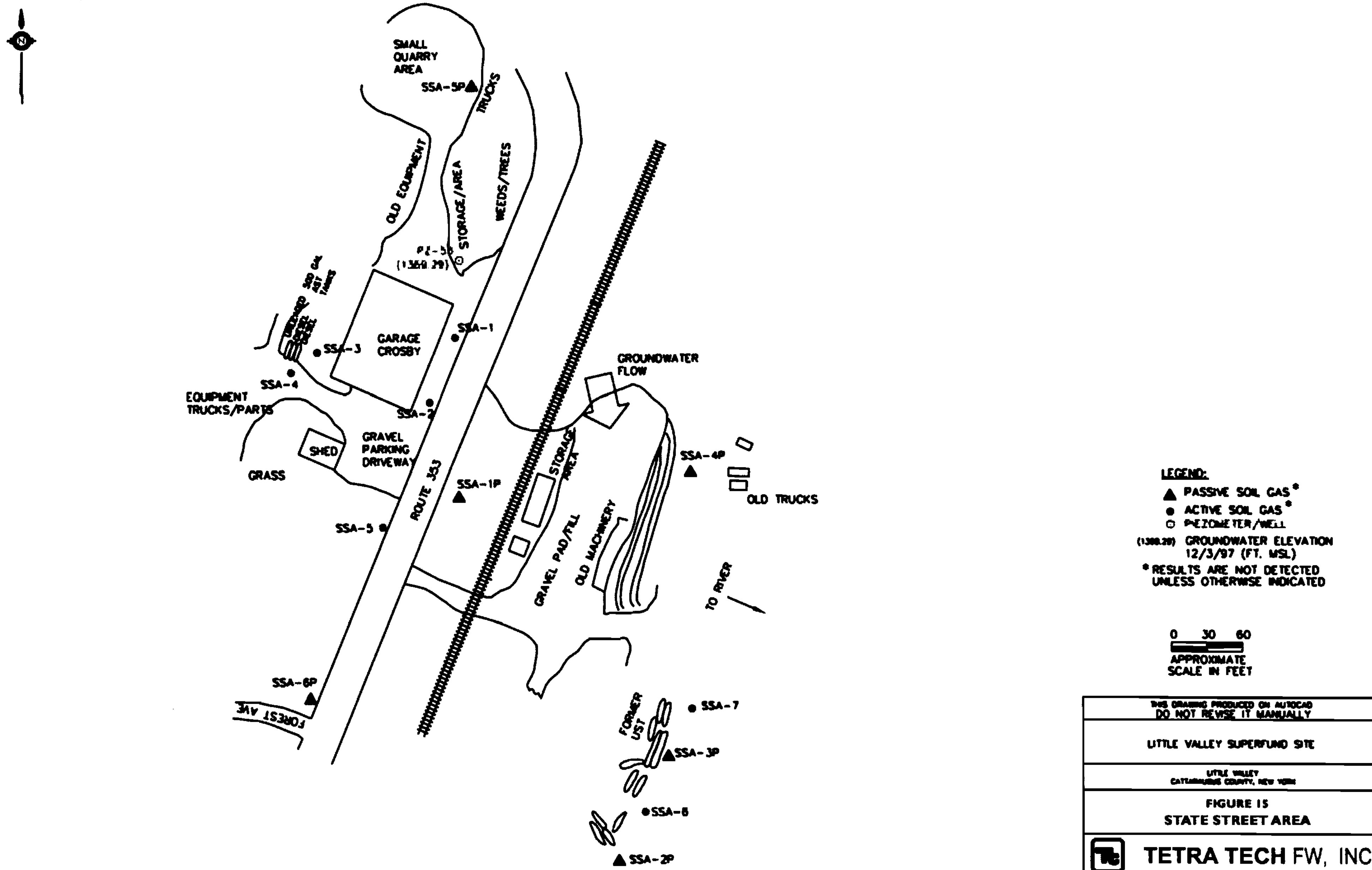
LITTLE VALLEY SUPERFUND SITE

LITTLE VALLEY
CATTARAUGUS COUNTY, NEW YORK

FIGURE 14
NORTH AND SOUTH LUMINITE AREAS

TETRA TECH FW, INC.

H:\GIS\GISKEY\GISPROJ31\EPA LITTLE VALLEY\FINAL RI FIGURES\FIGURE 1-15 (N&SLA).DWG



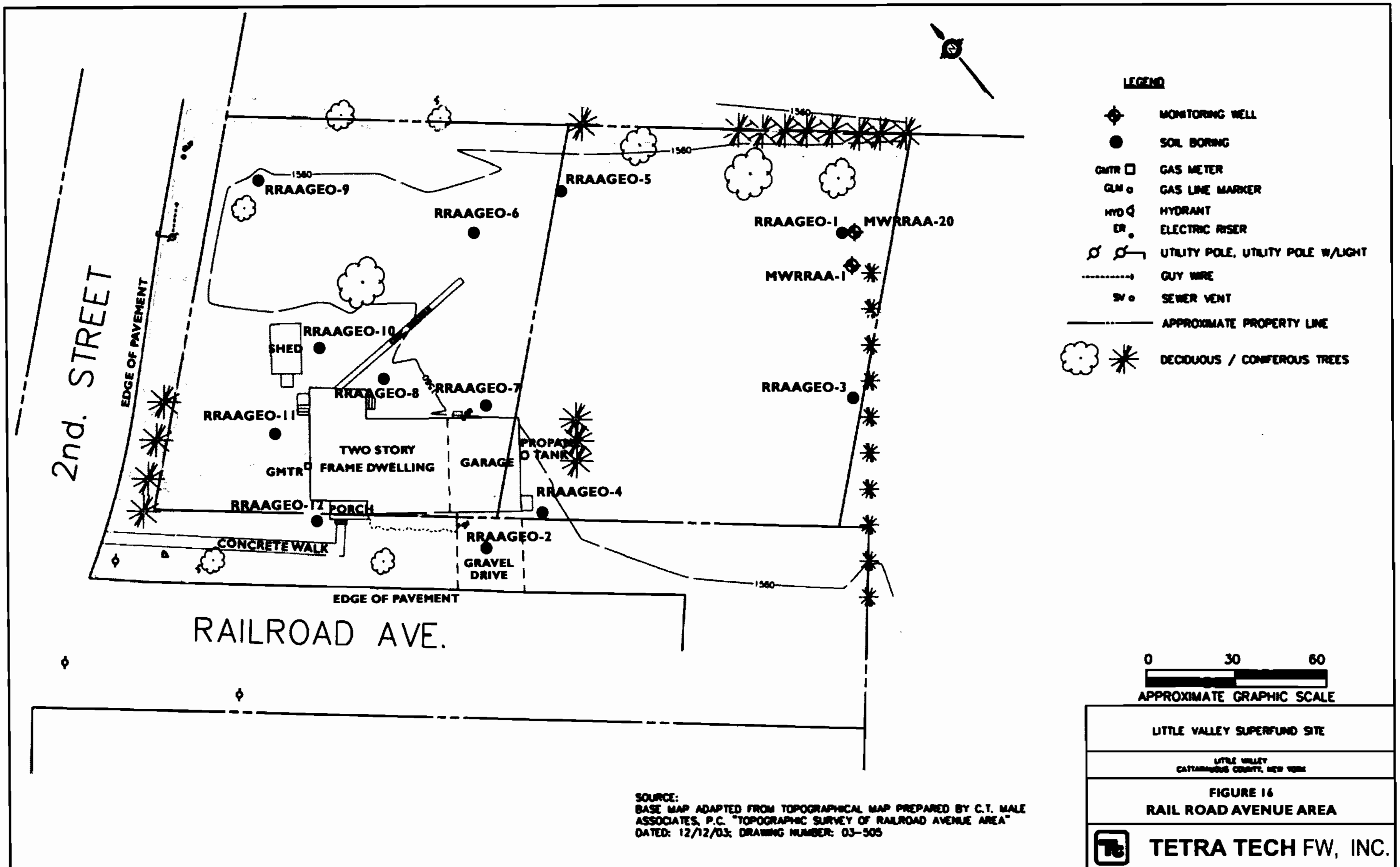
THIS DRAWING PRODUCED ON AUTOCAD
DO NOT REVISE IT MANUALLY

LITTLE VALLEY SUPERFUND SITE

LITTLE VALLEY
CATTARAUGUS COUNTY, NEW YORK

FIGURE 15
STATE STREET AREA

TETRA TECH FW, INC.



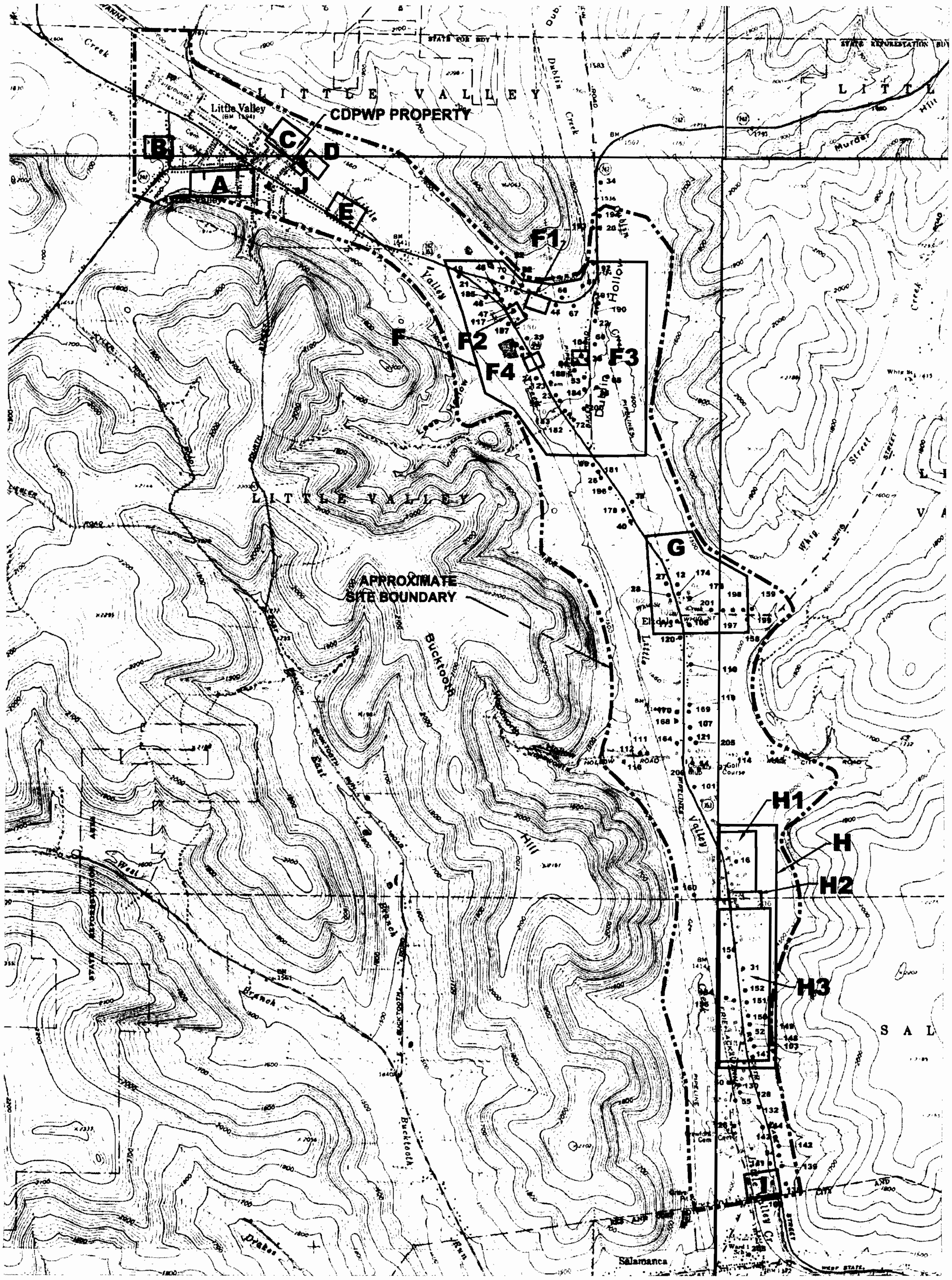
SOURCE:
BASE MAP ADAPTED FROM TOPOGRAPHICAL MAP PREPARED BY C.T. MALE ASSOCIATES, P.C. "TOPOGRAPHIC SURVEY OF RAILROAD AVENUE AREA"
DATED: 12/12/03; DRAWING NUMBER: 03-505

LITTLE VALLEY SUPERFUND SITE

LITTLE VALLEY
CATTARAUGUS COUNTY, NEW YORK

FIGURE 16
RAIL ROAD AVENUE AREA

TETRA TECH FW, INC.



LEGEND:

NYSDEC POTENTIAL SOURCE AREAS:

- **A** BUSH INDUSTRIES AREA
- **B** NINTH STREET LANDFILL AREA
- **C** CATTARAUGUS CUTLERY AREA
- **D** KING WINDOWS (SECOND STREET) AREA
- **E** FIRST STREET AREA
- **F** GREAT TRIANGLE AREA INCLUDES:
  - **F1** ENVIROTECH DRUM STORAGE
  - **F2** WESTERN BURNT HOUSE
  - **F3** WINSHIP CIRCLE/BAKER ROAD
  - **F4** TRIANGLE SOUTHWEST
- **G** WHIG STREET AREA
- **H** LUMINITE AREA INCLUDES:
  - **H1** NORTH LUMINITE
  - **H2** LUMINITE PLANT AREA
  - **H3** SOUTH LUMINITE
- **I** STATE STREET AREA
- **J** RAILROAD AVENUE AREA
- CDPWP CATTARAUGUS COUNTY DEPARTMENT OF PUBLIC WORKS PROPERTY

RESIDENTIAL WELL TCE RESULTS:

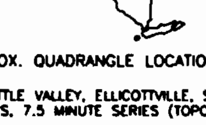
- ● NON-DETECT (ND) TO 5 UG/L
- ● 5 UG/L TO 10 UG/L
- ● 10 UG/L TO 30 UG/L

107 WELL IDENTIFICATION NUMBERS, AS SHOWN ON TABLES A-1 AND A-2 IN APPENDIX A.

TCE CONCENTRATIONS ARE FROM SAMPLING CONDUCTED BETWEEN NOVEMBER 1997 AND FEBRUARY 1999.

SAMPLES WERE COLLECTED FROM A PORT LOCATED PRIOR TO THE TREATMENT SYSTEM TRAIN (i.e., PRE-TREATMENT).

RESIDENTIAL SAMPLING LOCATIONS ARE APPROXIMATE (NOT SURVEYED).



APPROX. QUADRANGLE LOCATIONS

SOURCE: BASE MAP ADAPTED FROM U.S.G.S. LITTLE VALLEY, ELLICOTTVILLE, SALAMANCA, AND CATTARAUGUS NEW YORK QUADRANGLES, 7.5 MINUTE SERIES (TOPOGRAPHIC).

0 1400 2800

APPROXIMATE GRAPHIC SCALE

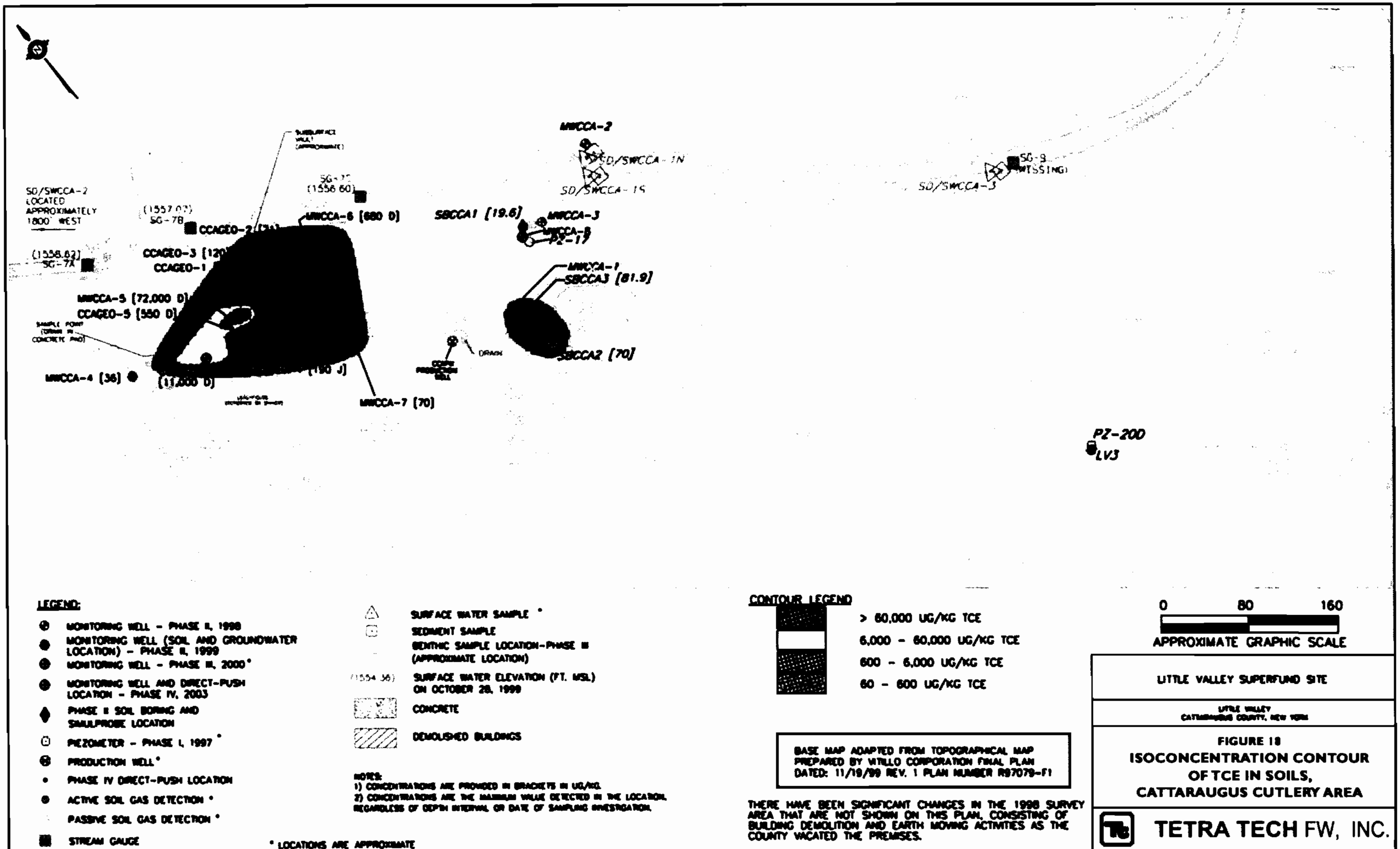
LITTLE VALLEY SUPERFUND SITE

LITTLE VALLEY
CATTARAUGUS COUNTY, NEW YORK

FIGURE 17
HISTORIC TCE SAMPLING RESULTS IN RESIDENTIAL WELLS

TETRA TECH FW, INC.

N:\DIS\DISKEY\DISPROJ31\EPA LITTLE VALLEY\FINAL RI FIGURES\FIGURE 1-2 (TCE RESIDENTIAL HISTORIC).DWG


SD/SWCCA-2 LOCATED APPROXIMATELY 1800' WEST
(1558.82) SG-7A
(1557.07) SG-7B
SG-7C (1556.60)
CCAGEO-2
CCAGEO-3 [120
CCAGEO-1
MWCCA-6 [680 D]
MWCCA-5 [72,000 D]
CCAGEO-5 [550 D]
SAMPLE POINT (DRAIN IN CONCRETE PAD)
MWCCA-4 [36]
[11,000 D]
[190 J]
MWCCA-7 [70]
SUBSURFACE VAULT (APPROXIMATE)
SBCCA1 [19.6]
MWCCA-2
SD/SWCCA-1N
SD/SWCCA-1S
MWCCA-3
MWCCA-8
PZ-17
MWCCA-1
SBCCA3 [81.9]
SBCCA2 [70]
DRAIN
COOPER PRODUCTION WELL
SG-9 (MISSING)
SD/SWCCA-3
PZ-20D
LV3
LEGEND:
MONITORING WELL - PHASE II, 1998
MONITORING WELL (SOIL AND GROUNDWATER LOCATION) - PHASE II, 1999
MONITORING WELL - PHASE III, 2000 *
MONITORING WELL AND DIRECT-PUSH LOCATION - PHASE IV, 2003
PHASE II SOIL BORING AND SIMULPROBE LOCATION
PIEZOMETER - PHASE I, 1997 *
PRODUCTION WELL *
PHASE IV DIRECT-PUSH LOCATION
ACTIVE SOIL GAS DETECTION *
PASSIVE SOIL GAS DETECTION *
STREAM GAUGE
SURFACE WATER SAMPLE *
SEDIMENT SAMPLE
BENTHIC SAMPLE LOCATION-PHASE III (APPROXIMATE LOCATION)
(1554.36) SURFACE WATER ELEVATION (FT. MSL) ON OCTOBER 28, 1999
CONCRETE
DEMOLISHED BUILDINGS
NOTES:
1) CONCENTRATIONS ARE PROVIDED IN BRACKETS IN UG/KG.
2) CONCENTRATIONS ARE THE MAXIMUM VALUE DETECTED IN THE LOCATION, REGARDLESS OF DEPTH INTERVAL OR DATE OF SAMPLING INVESTIGATION.
* LOCATIONS ARE APPROXIMATE
CONTOUR LEGEND
> 60,000 UG/KG TCE
6,000 - 60,000 UG/KG TCE
600 - 6,000 UG/KG TCE
60 - 600 UG/KG TCE
BASE MAP ADAPTED FROM TOPOGRAPHICAL MAP PREPARED BY VITILLO CORPORATION FINAL PLAN DATED: 11/19/99 REV. 1 PLAN NUMBER R97079-F1
THERE HAVE BEEN SIGNIFICANT CHANGES IN THE 1998 SURVEY AREA THAT ARE NOT SHOWN ON THIS PLAN, CONSISTING OF BUILDING DEMOLITION AND EARTH MOVING ACTIVITIES AS THE COUNTY VACATED THE PREMISES.
0 80 160
APPROXIMATE GRAPHIC SCALE
LITTLE VALLEY SUPERFUND SITE
LITTLE VALLEY CATTARAUGUS COUNTY, NEW YORK
FIGURE 18
ISOCONCENTRATION CONTOUR OF TCE IN SOILS, CATTARAUGUS CUTLERY AREA
TETRA TECH FW, INC.

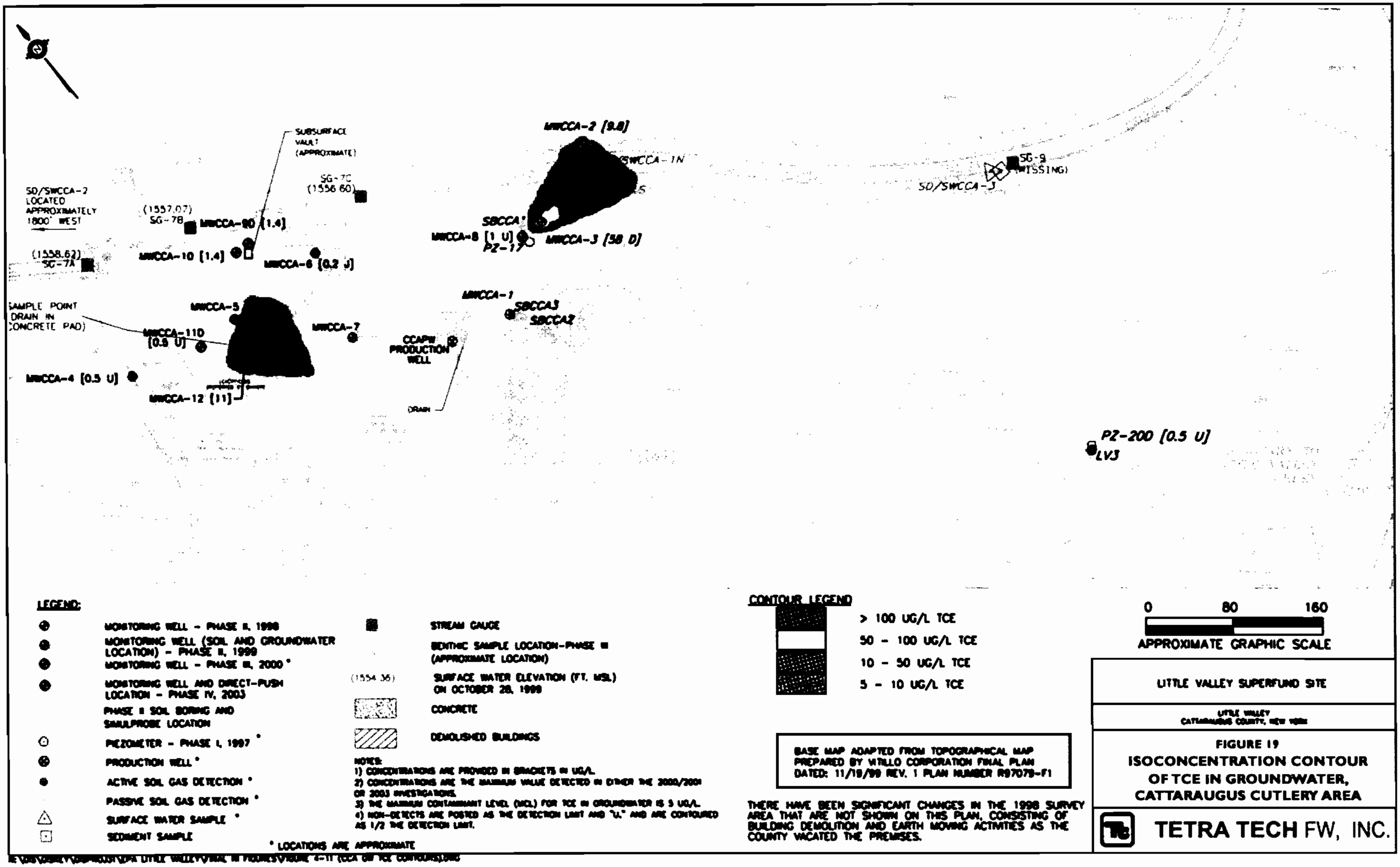
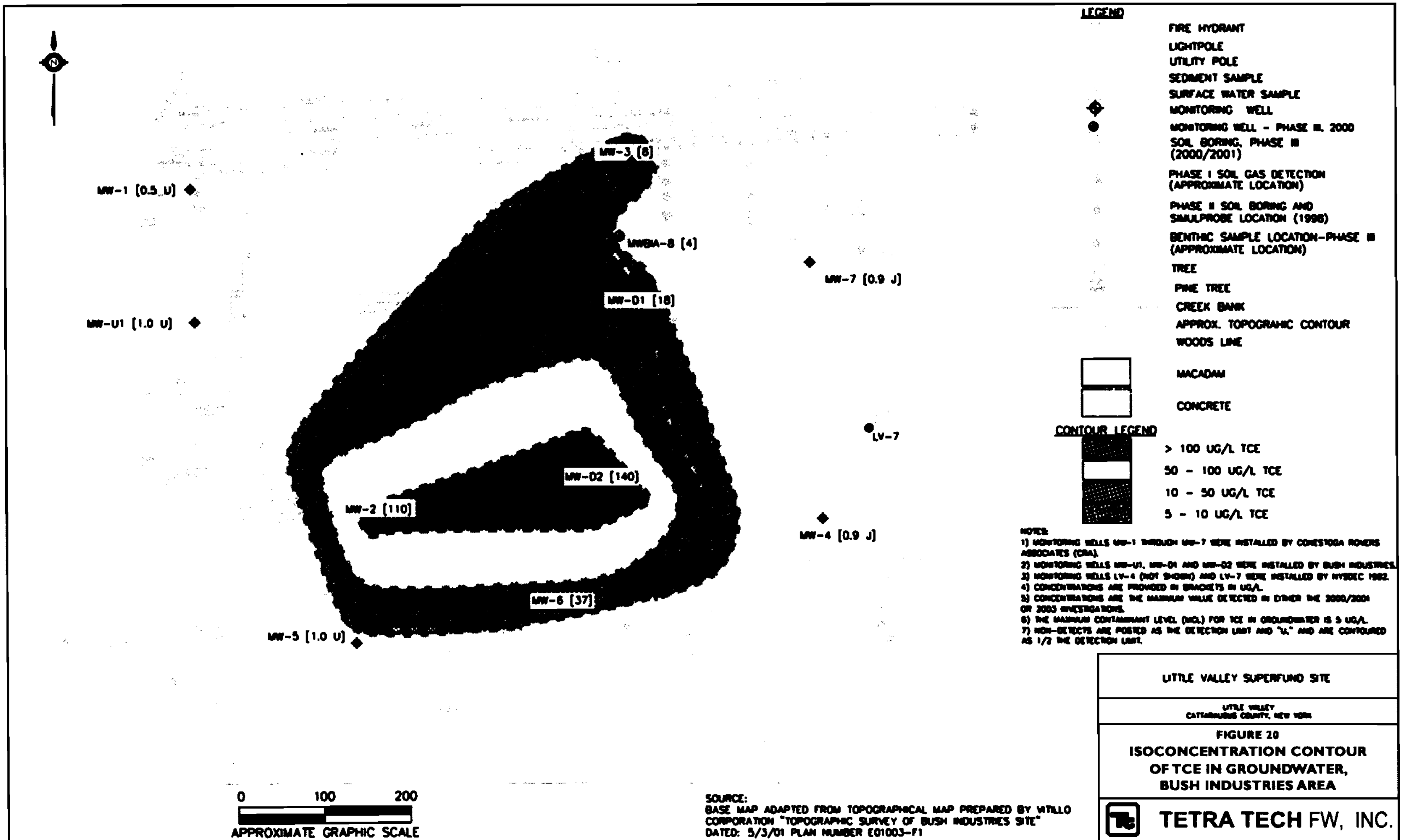
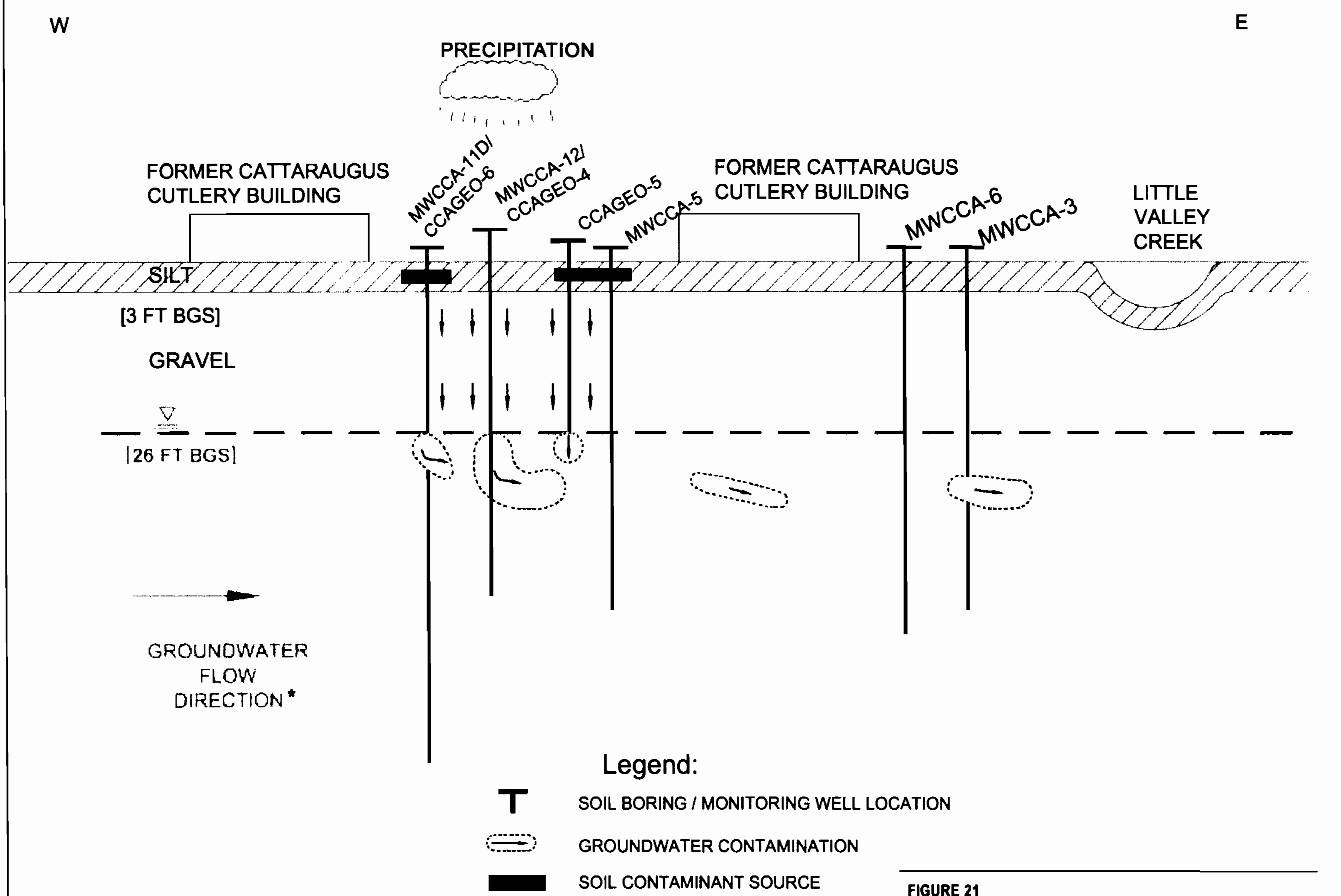


FIGURE 19
ISOCONCENTRATION CONTOUR OF TCE IN GROUNDWATER, CATTARAUGUS CUTLERY AREA

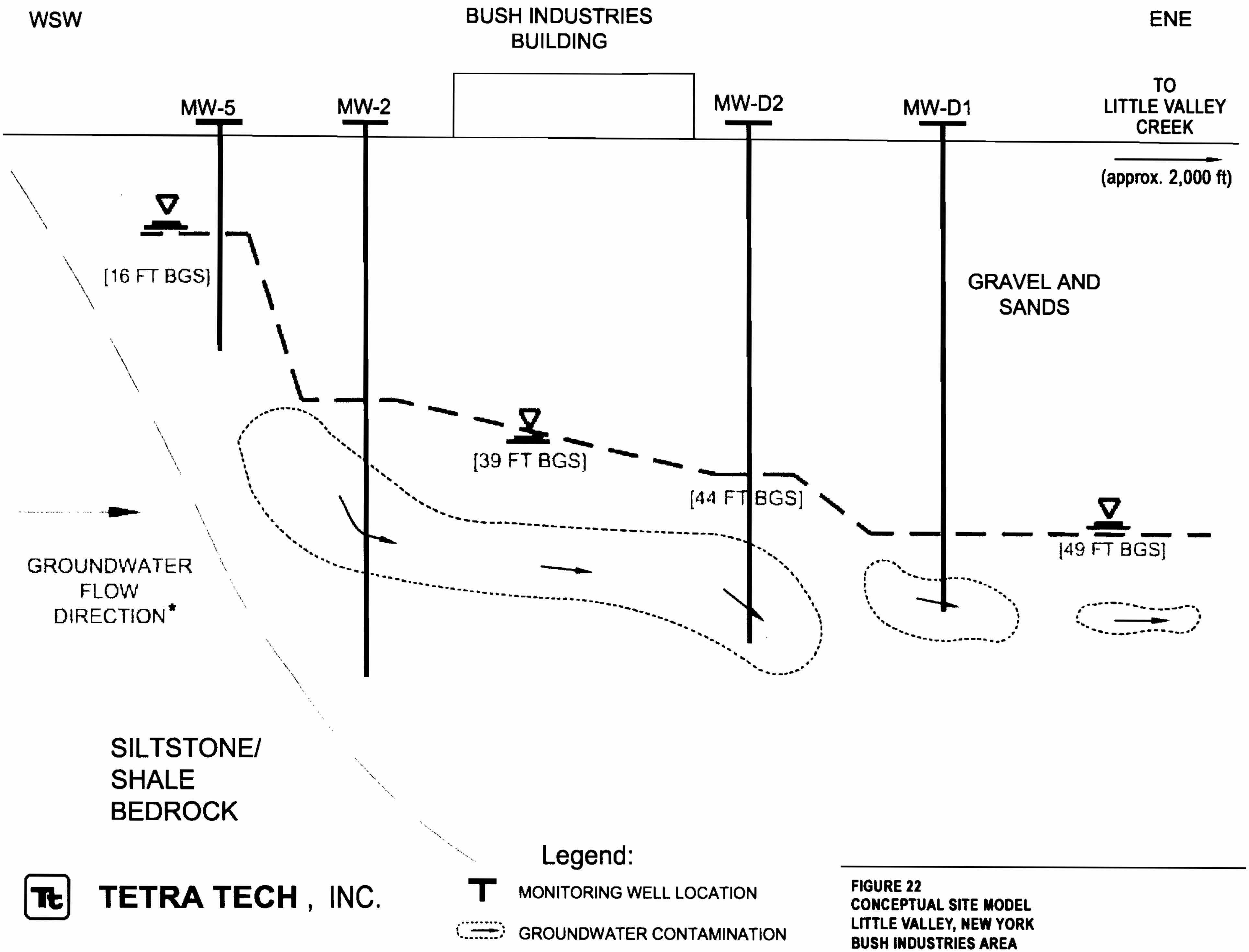

N
MW-1 [0.5 U]
MW-U1 [1.0 U]
MW-3 [8]
MWBIA-8 [4]
MW-01 [18]
MW-02 [140]
MW-2 [110]
MW-6 [37]
MW-5 [1.0 U]
MW-7 [0.9 J]
LV-7
MW-4 [0.9 J]
0
100
200
APPROXIMATE GRAPHIC SCALE
LEGEND
FIRE HYDRANT
LIGHTPOLE
UTILITY POLE
SEDIMENT SAMPLE
SURFACE WATER SAMPLE
MONITORING WELL
MONITORING WELL - PHASE III, 2000
SOIL BORING, PHASE III (2000/2001)
PHASE I SOIL GAS DETECTION (APPROXIMATE LOCATION)
PHASE II SOIL BORING AND SIMULPROBE LOCATION (1998)
BENTHIC SAMPLE LOCATION-PHASE III (APPROXIMATE LOCATION)
TREE
PINE TREE
CREEK BANK
APPROX. TOPOGRAHIC CONTOUR
WOODS LINE
MACADAM
CONCRETE
CONTOUR LEGEND
> 100 UG/L TCE
50 - 100 UG/L TCE
10 - 50 UG/L TCE
5 - 10 UG/L TCE
NOTES:
1) MONITORING WELLS MW-1 THROUGH MW-7 WERE INSTALLED BY CONESTOGA ROVERS ASSOCIATES (CRA).
2) MONITORING WELLS MW-U1, MW-01 AND MW-02 WERE INSTALLED BY BUSH INDUSTRIES.
3) MONITORING WELLS LV-4 (NOT SHOWN) AND LV-7 WERE INSTALLED BY NYSDEC 1982.
4) CONCENTRATIONS ARE PROVIDED IN BRACKETS IN UG/L.
5) CONCENTRATIONS ARE THE MAXIMUM VALUE DETECTED IN EITHER THE 2000/2001 OR 2003 INVESTIGATIONS.
6) THE MAXIMUM CONTAMINANT LEVEL (MCL) FOR TCE IN GROUNDWATER IS 5 UG/L.
7) NON-DETECTS ARE POSTED AS THE DETECTION LIMIT AND "U," AND ARE CONTOURED AS 1/2 THE DETECTION LIMIT.
SOURCE:
BASE MAP ADAPTED FROM TOPOGRAPHICAL MAP PREPARED BY VITILLO CORPORATION "TOPOGRAPHIC SURVEY OF BUSH INDUSTRIES SITE" DATED: 5/3/01 PLAN NUMBER E01003-F1
LITTLE VALLEY SUPERFUND SITE
LITTLE VALLEY
CATTARAUGUS COUNTY, NEW YORK
FIGURE 20
ISOCONCENTRATION CONTOUR OF TCE IN GROUNDWATER, BUSH INDUSTRIES AREA
TETRA TECH FW, INC.



TETRA TECH , INC.

FIGURE 21
CONCEPTUAL SITE MODEL
LITTLE VALLEY, NEW YORK
CATTARAUGUS CUTLERY AREA

* An additional component of groundwater flow exists through Little Valley perpendicular to this view



TETRA TECH, INC.

FIGURE 22
CONCEPTUAL SITE MODEL
LITTLE VALLEY, NEW YORK
BUSH INDUSTRIES AREA

* An additional component of groundwater flow exists through Little Valley perpendicular to this view

LITTLE VALLEY SUPERFUND SITE
ROD

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TABLE 1
COMPARISON CRITERIA FOR DETECTED CONSTITUENTS IN SOIL

BASIS FOR CRITERIA	HUMAN HEALTH			ECOLOGICAL		STATE	
Constituents	EPA Generic Soil Screening (Ingestion)	EPA Generic Soil Screening (Inhalation)	EPA Generic Migration to Groundwater (20 DAF)	EPA Ecological Screening Levels	PRGs for Ecological Endpoints	NYSDEC Recommended Soil Cleanup Objectives	CLEANUP LEVEL USED*
Volatile Organics (µg/kg)							
1,2-Dichloroethene (total)	780,000	NC	400	NC	NC	300	300
cis-1,2,Dichloroethene	780,000	NC	400	NC	NC	NC	400
Trichloroethene	2,000	70	60	NC	NC	700	700[1]

* Unless otherwise noted, the "Cleanup Level Used" values are the most stringent of the available comparison criteria for each compound.

[1] Since the New York State soil TAGM objective for TCE of 700 µg/kg would result in a groundwater concentration of TCE equal to both the EPA and New York State MCLs (5 µg/L), it will be used to define the TCE-contaminated soils at the Site, rather than the more conservative EPA soil screening level.

NOTES:
Abbreviations: DAF indicates Dilution Attenuation Factor; NC indicates no criteria available; SB indicates site background value; NA indicates not applicable; ND indicates not detected.

REFERENCES:

EPA Soil Screening Levels from Exhibit A-1, Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. December 2002.

EPA Ecological Soil Screening Levels from Ecological Soil Screening Level Guidance, Draft. July 10, 2000; and Ecological Soil Screening Levels for Antimony, Barium, Beryllium, Cadmium, Cobalt, Lead, and Dieldrin, Interim Final. November 2003.

NYSDEC Levels from Division Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels, 24 January 1994; and Internal Memorandum: Determination of Soil Cleanup Levels, December 20, 2000.

PRGs for Ecological Endpoints from Efroymson, R.A., G.W. Suter II, B.E. Sample, and D.S. Jones. Preliminary Remediation Goals for Ecological Endpoints. ES/ER/TM-162/R2. Oak Ridge National Laboratory, U.S. Department of Energy. August 1997.

TABLE 2

COMPARISON CRITERIA FOR DETECTED CONSTITUENTS IN SEDIMENTS

BASIS FOR CRITERIA	[redacted]	**STATE**						
		NYSDEC Sediment Guidance Values						
Constituents		**Human Health Bioaccumulation**		**Aquatic Life - Acute Toxicity**		**Aquatic Life - Chronic Toxicity**		**Cleanup Level Used**
		ug/gOC	**ug/kg***	***ug/gOC***	**ug/kg***	***ug/gOC***	**ug/kg***	**ug/kg***
Volatile Organics								
cis-1,2-Dichloroethene	[redacted]	*NC*	NC	*NC*	NC	*NC*	NC	400

NOTES:

* indicates that a default value of 1% TOC (10,000 mg/kg) was used in the calculation of screening criteria.
"NC" indicates no criteria available.

REFERENCES

NYSDEC Sediment Criteria are from Technical Guidance for Screening Contaminated Sediments, January 1999.

Ontario Guidelines are from Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario. Ontario Ministry of Environment and Energy, August 1993

PRGs for Ecological Endpoints from Efroymson, R.A., G.W. Suter II, B.E. Sample, and D.S. Jones. Preliminary Remediation Goals for Ecological Endpoints. ES/ER/TM-162/R2. Oak Ridge National Laboratory, U.S. Department of Energy. August 1997.

TABLE 3
COMPARISON CRITERIA FOR DETECTED CONSTITUENTS IN SURFACE WATER

BASIS FOR CRITERIA	HUMAN HEALTH		ECOLOGICAL			STATE	CLEANUP LEVEL USED*
Constituents	EPA Water Quality Criteria HH Water&Org	EPA Water Quality HH Org Only	EPA Water Quality Criteria Aquatic CMC	EPA Water Quality Criteria Aquatic CCC	PRGs for Ecological Endpoints	NYSDEC Water Values [Class C]	
Volatile Organics							
1,2-Dichloroethane	0.38	37	NC	NC	910	NC	0.38
Chloroethane	NC	NC	NC	NC	NC	NC	NC
cis-1,2-Dichloroethene	NC	NC	NC	NC	590	NC	590
Trichloroethene	2.5	30	NC	NC	470	40	2.5

* Unless otherwise noted, the "Cleanup Level Used" values are the most stringent of the available comparison criteria for each compound.

NOTES:
"CMC" indicates Criteria Maximum Concentration; "CCC" indicates Criteria Continuous Concentration.
"HH Water&Org" indicates Human Health value for the consumption of water and organisms; "HH Org Only" indicates Human Health value for the consumption of organisms only.
NC indicates no criteria available.

REFERENCES:
EPA Criteria from National Recommended Water Quality Criteria: 2002, EPA 822-R-02-047, November 2002.

NYSDEC Values are from Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, June 1998; Errata Sheet for the June 1998 TOGS 1.1.1, January 1999; and April 2000 Addendum to the June 1998 TOGS 1.1.1, April 2000.

PRGs for Ecological Endpoints from Efroymson, R.A., G.W. Suter II, B.E. Sample, and D.S. Jones. Preliminary Remediation Goals for Ecological Endpoints. ES/ER/TM-162/R2. Oak Ridge National Laboratory, U.S. Department of Energy. August 1997.

TABLE 4
COMPARISON CRITERIA FOR DETECTED CONSTITUENTS IN GROUNDWATER

BASIS FOR CRITERIA	HUMAN HEALTH	STATE	
Constituents	EPA Maximum Contaminant Level	NYSDEC Water Quality Values [Class GA]	CLEANUP LEVEL USED*
Volatile Organics (µg/L)			
Vinyl chloride	2	2	2
Chloroethane	NC	5	5
1,1-Dichloroethene	7	5	5
cis-1,2-Dichloroethene	70	5	5
1,2-Dichloroethene (total)	70	5	5
trans-1,2-Dichloroethene	100	5	5
1,2-Dichloroethane	5	0.6	0.6
Trichloroethene	5	5	5
Tetrachloroethene	5	5	5
Water Quality/Natural Attenuation Parameters (mg/L)			
Alkalinity	NC	NC	NC
Chloride	250*	250	250
Methane	NC	NC	NC
Nitrate	10	10	10
Sulfate	250*	250	250
TOC	NC	NC	NC

* Unless otherwise noted, the "Cleanup Level Used" values are the most stringent of the available comparison criteria for each compound.

NOTES:
* indicates value is a secondary drinking water regulation criterion.
NC indicates no criteria available.

REFERENCES
EPA Criteria from National Primary Drinking Water Standards, EPA 816-F-01-007, March 2001; Secondary Drinking Water Standards: Guidance for Nuisance Chemicals, EPA 810/K-92-001, July 1992; and "EPA to Implement 10 ppb Standard for Arsenic in Drinking Water," EPA 815-F-01-010, October 2001.

NYSDEC Values are from Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, June 1998; Errata Sheet for the June 1998 TOGS 1.1.1, January 1999; and April 2000 Addendum to the June 1998 TOGS 1.1.1, April 2000.

TABLE 5
SUMMARY OF DETECTED SOIL CONSTITUENTS FROM NINTH STREET LANDFILL AREA

Location	SB9LF1	SB9LF1	SB9LF2	SB9LF2	SB9LF2	SB9LF2
Depth	35'-37'	70'-72'	0'-2'	2'-4'	53'-55'	58'-60'
Trichloroethene	--	--	--	--	2 J	4 J

NOTES:
Samples were also collected from location SB9LF1 at the following depth intervals (bgs): 0 to 2 feet, 20 to 22 feet, 40 to 42 feet, 50 to 52 feet, 60 to 62 feet, and 66 to 68 feet. No constituents were detected in these samples.

Samples were also collected from location SB9LF2 at the following depth intervals (bgs): 18 to 20 feet, 33 to 35 feet, 48 to 50 feet, 63 to 65 feet, and 78 to 80 feet. No constituents were detected in these samples.

See Figure 3 for sampling locations.

None of the detected values exceed comparison criteria for soils (see Table 1).

"J" qualifier indicates estimated concentration value.

"--" indicates not detected.

TABLE 6 (Sheet 1 of 2)
SUMMARY OF DETECTED SOIL CONSTITUENTS FROM BUSH INDUSTRIES AREA

Location	SBBIA2	SBBIA3	SBBIA3	SBBIA4	SBBIA4	SBBIA4	SBBIA4	SBBIA4	SBBIA4	SBBIA5	SBBIA5
Depth	50'-52'	8'-10'	50'-52' Duplicate	0'-2'	0'-2' Duplicate	15'-17'	30'-32'	40'-42'	50'-52'	0'-2'	30'-32'
Volatile Organics (ug/kg)											
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	1 J	--	--	--	--	--	--	--	--	--	--

Location	SBBIA5	SBBIA5	SB-101	SB-101	SB-101	SB-101	SB-101	SB-102	SB-102	SB-102	SB-102
Depth	47'-49'	60'-62'	0'-2'	4'-6'	14'-16'	24'-26'	34'-36'	0'-2'	4'-6'	8'-10'	14'-16'
Volatile Organics (ug/kg)											
cis-1,2-Dichloroethene	NA	NA	--	--	--	--	--	--	--	--	--
Trichloroethene	--	--	--	--	--	--	--	--	--	--	5 J

Location	SB-102	SB-103	SB-103	SB-103	SB-103	SB-103	SB-104	SB-104	SB-104	SB-104	SB-105
Depth	18'-20'	0'-2'	4'-6'	14'-16'	18'-20'	24'-26'	0'-2'	4'-6'	8'-10'	8'-10' Duplicate	0'-2'
Volatile Organics (ug/kg)											
cis-1,2-Dichloroethene	3 J	--	--	5 J	5 J	2 J	--	8 J	--	--	--
Trichloroethene	6 J	--	--	36	34	19	--	33	61	29	--

Location	SB-105	SB-105	SB-105	SB-106	SB-106	SB-106	SB-106	SB-107	SB-107	SB-107	SB-107
Depth	4'-6'	8'-10'	14'-16'	0'-2'	4'-6'	8'-10'	18'-20'	0'-2'	4'-6'	8'-10'	14'-16'
Volatile Organics (ug/kg)											
cis-1,2-Dichloroethene	6 J	3 J	3 J	--	2 J	--	--	--	--	--	2 J
Trichloroethene	15	56	23	--	--	--	--	--	--	--	13 J

Location	SB-108	SB-108	SB-108	SB-108	SB-109	SB-109	SB-109	SB-109	SB-109	SB-109	MW-8
Depth	0'-2'	4'-6'	10'-12'	14'-16'	0'-2'	4'-6'	4'-6' Duplicate	8'-10'	14'-16'	24'-26'	4'-6'
Volatile Organics (ug/kg)											
cis-1,2-Dichloroethene	--	3 J	5 J	3 J	--	--	--	--	--	--	--
Trichloroethene	--	--	8 J	4 J	--	--	--	--	--	--	--

Location	MW-8	MW-8	MW-8	MW-8	MW-8
Depth	8'-10'	8'-10' Duplicate	18'-20'	34'-36'	34'-36'
Volatile Organics (ug/kg)					
cis-1,2-Dichloroethene	--	--	--	--	--
Trichloroethene	--	--	--	--	--

TABLE 7

SUMMARY OF DETECTED SOIL CONSTITUENTS FROM CATTARAUGUS CUTLERY AREA

Location	SBCCA1	SBCCA1	SBCCA1	SBCCA1	SBCCA2	SBCCA2	SBCCA2	SBCCA2	SBCCA2	SBCCA3	SBCCA3	SBCCA3	SBCCA3	SBCCA3	SBCCA3	MWCCA-4
Depth	13'-15'	28'-30'	30'-32'	35'-37'	12'-14'	14'-16'	16'-18'	18'-20'	20'-22'	0'-2'	13'-15'	18'-20'	23'-25'	28'-30'	40'-42'	0"-2"
Volatile Organics (ug/kg)																
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--
1,2-Dichloroethene (total)	--	--	--	--	--	--	--	--	--	--	3 J	--	--	--	--	NA
Trichloroethene	--	3 J	4 J	11 J	7 J	10 J	--	7 J	9 J	18	70	28	45	23	2 J	--

Location	MWCCA-4	MWCCA-4	MWCCA-4	MWCCA-4	MCBCCA-4	MWCCA-4	MWCCA-4	MCCCA-4	MWCCA-4	MWCCA-5	MWCCA-5	MWCCA-5	MWCCA-5	MWCCA-5	MWCCA-5	MWCCA-5
Depth	4'-6'	10'-12'	14'-16'	20'-22'	24'-26'	30'-32'	34'-36'	40'-42'	44'-46'	0"-2"	1.5'-2'	5'-7'	10'-12'	10'-12' Duplicate	15'-17'	20'-22'
Volatile Organics (ug/kg)																
cis-1,2-Dichloroethene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	--	36	27	32	24	--	--	--	--	1200 D	72000 D	41	91	140	120	58

Location	MWCCA-5	MWCCA-5	MWCCA-5	MWCCA-5	MWCCA-5	Drain Material (near CCA5)	MWCCA-6	MWCCA-6	MWCCA-6	MWCCA-6	MWCCA-6	MWCCA-6	MWCCA-6	MWCCA-6	MWCCA-6	MWCCA-6
Depth	25'-27'	30'-32'	35'-37'	40'-42'	45'-47'		0"-2"	5'-7'	10'-12'	15'-17'	20'-22'	25'-27'	30'-32'	30'-32' Duplicate	35'-37'	40'-42'
Volatile Organics (ug/kg)																
cis-1,2-Dichloroethene	--	--	--	--	--	--	--	--	--	--	--	5 J	--	5 J	--	--
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	76	8 J	--	--	--	53 J	--	--	13 J	70	220	680 D	93	220	--	5 J

Location	MWCCA-6	MWCCA-7	MWCCA-7	MWCCA-7	MWCCA-7	MWCCA-7	MWCCA-7	MWCCA-7	MWCCA-7	MWCCA-7	MWCCA-7	MWCCA-7	MWCCA-7	CCAGEO-1	CCAGEO-1	CCAGEO-1
Depth	45'-47'	0"-2"	5'-7'	10'-12'	15'-17'	20'-22'	25'-27'	25'-27' Duplicate	30'-32'	30'-32' Duplicate	35'-37'	40'-42'	45'-47'	0'-1'	6'-8'	16'-18'
Volatile Organics (ug/kg)																
cis-1,2-Dichloroethene	--	--	--	--	--	--	--	--	--	NA	--	--	--	--	--	3 J
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			
Trichloroethene	--	--	26	28	17	22	67	48	70	NA	4 JN	--	--	3 J	2 J	86

Location	CCAGEO-1	CCAGEO-2	CCAGEO-2	CCAGEO-2	CCAGEO-2	CCAGEO-3	CCAGEO-3	CCAGEO-3	CCAGEO-3	CCAGEO-4	CCAGEO-4	CCAGEO-4	CCAGEO-4	CCAGEO-5	CCAGEO-5	CCAGEO-5
Depth	26'-28'	0'-1'	6'-8'	18'-20'	25'-27'	0'-1'	8'-10'	20'-22'	25'-27'	0'-1'	8'-10'	16'-18'	22'-24'	0'-1'	0'-1' Duplicate	2'-4'
Volatile Organics (ug/kg)																
cis-1,2-Dichloroethene	7 J	--	--	--	1 J	--	--	0.7 J	4 J	--	0.5 J	--	--	--	--	--
1,2-Dichloroethene (total)																
Trichloroethene	110	14	1 J	71	27	6 J	9 J	70	120	40	190 J	72	150	110 D	96 J	550 D

TABLE 7

SUMMARY OF DETECTED SOIL CONSTITUENTS FROM CATTARAUGUS CUTLERY AREA

Location	CCAGEO-5	CCAGEO-5	CCAGEO-6	CCAGEO-6	CCAGEO-6	CCAGEO-6
Depth	6'-8'	20'-22'	0'-1'	1'-2'	12'-14'	22'-24'
Volatile Organics (ug/kg)						
cis-1,2-Dichloroethene	--	--	--	830 J	--	--
1,2-Dichloroethene (total)				NA		
Trichloroethene	84	87 D	73	11000 D	170 D	26

NOTES:

Samples were also collected from location SBCCA1 at the following depth intervals (bgs): 0 to 2 feet, 6 to 8 feet, 8 to 10 feet, 18 to 20 feet and 23 to 25 feet. No constituents were detected in these samples.

Samples were also collected from location SBCCA2 at the following depth intervals (bgs): 0 to 2 feet, 6 to 8 feet, 10 to 12 feet, 30 to 32 feet, 32 to 34 feet, and 38 to 40 feet. No constituents were detected in these samples.

A sample was also collected from location SBCCA3 at a depth interval (bgs) of 2 to 4 feet. No constituents were detected in this sample.

See Figure 5 for sampling locations.

Shaded values exceed their most conservative criteria value for comparison (see Table 1):

Exceeds human health - based values.

Exceeds ecological-based values.

Exceeds state values.

Exceeds two or more of the above values.

"J" qualifier indicates estimated concentration value.

"D" qualifier indicates concentration value from a dilution analysis.

"R" qualifier indicates rejected value (unusable).

"B" qualifier (for metals only) indicates concentration is between contract required quantitation limit and instrument detection limit.

"K" qualifier indicates estimated concentration value, biased high.

"L" qualifer indicates estimated concentration value, biased low.

"--" indicates not detected.

"NA" indicates not analyzed/not applicable.

"NC" indicates no criteria comparison value available.

TABLE 8
SUMMARY OF DETECTED SOIL CONSTITUENTS FROM KING WINDOWS (SECOND STREET) AREA

Location	SBKWA1	SBKWA1	SBKWA1	SBKWA1	SBKWA1
Depth	0'-2'	10'-12'	10'-12' Duplicate	18'-20'	24'-26'
Volatile Organics (ug/kg)					
2-Butanone	--	5 J	--	6 J	5 J
Methylene chloride	2 J	1 J	1 J	1 J	1 J
Toluene	2 J	--	--	--	--

NOTES:

Samples were also collected from location SBKWA1 at the following depth intervals (bgs): 28 to 30 feet and 30 to 32 feet. No constituents were detected in these samples.

See Figure 6 for sampling locations.

None of the detected values exceed comparison criteria for soils (see Table 1).

"J" qualifier indicates estimated concentration value.

"--" indicates not detected.

TABLE 9
SUMMARY OF DETECTED SOIL CONSTITUENTS FROM FIRST STREET AREA

Location	SB1ST1	SB1ST1
Depth	25'-27' Duplicate	45'-47'
Volatile Organics (ug/kg)		
2-Butanone	5 J	5 J
Methylene chloride	1 J	1 J
Toluene	0.4 J	--

NOTES:

Samples were also collected from location SB1ST1 at the following depth intervals (bgs): 0 to 2 feet, 8 to 10 feet, 14 to 16 feet, and 25 to 27 feet. No constituents were detected in these samples.

See Figure 11 for sampling locations.

None of the detected values exceed comparison criteria for soil (see Table 1).

"J" qualifier indicates estimated concentration value.

"--" indicates not detected.

TABLE 10
SUMMARY OF DETECTED SOIL CONSTITUENTS FROM GREAT TRIANGLE AREA

Location	SBGTA1	SBGTA1	SBGTA1	SBGTA2	SBGTA2	SBGTA2	SBGTA2	SBGTA2
Depth	0'-2'	29'-31'	69'-71'	0'-2'	8'-10'	22'-24'	30'-32'	35'-37'
Volatile Organics (ug/kg)								
Trichloroethene	--	1 J	3 J	--	--	--	--	--

NOTES:

Samples were also collected from location SBGTA1 at the following depth intervals (bgs): 8 to 10 feet, 19 to 21 feet, 49 to 51 feet, 74 to 76 feet, 79 to 81 feet, 84 to 86 feet, 94 to 96 feet, and 99 to 101 feet. No constituents were detected in these samples.

See Figure 7 for sampling locations.

None of the detected values exceed comparison criteria for soils (see Table 1).

"J" qualifier indicates estimated concentration value.

"--" indicates not detected.

TABLE 11
MAXIMUM SOIL TCE CONCENTRATIONS
(MOST RECENT DATA)

Area	Maximum TCE Concentration (µg/kg)	Year
Bush Industries	61	2003
Cattaraugus Cutlery	72,000	2003
King Windows	ND	1998
First Street	ND	1998
Great Triangle	3	1998
Whig Street	ND	1998
Luminite	AE	AE
Ninth Street Landfill	4	1998
State Street	AE	AE
Railroad Avenue	ND	2003

Key:

ND=Not detected.
AE=Area eliminated from consideration based on 1997 soil gas screening results. No soil samples were collected.

TABLE 12
SUMMARY OF DETECTED SEDIMENT CONSTITUENTS FROM BUSH INDUSTRIES AREA

Location	SD-1	SD-2	SD-2	SD-3	SD-3	SD-3	SD-3	SD-4	SD-4	SD-5	SD-5
Depth	0"-6" (A interval)	0"-6" (A interval)	6"-12" (B interval)	0"-6" (A interval)	0"-6" (A interval) Duplicate	6"-12" (B interval)	12"-18" (C interval)	0"-6" (A interval)	6"-10" (B interval)	0"-6" (A interval)	6"-12" (B interval)
Volatile Organics (ug/kg)											
cis-1,2-Dichloroethene	--	--	--	19 J	12 J	12 J	6 J	--	--	--	--

NOTES:

See Figure 4 for sampling locations.
No comparison criteria were exceeded for sediments (see Table 2).
"J" qualifier indicates estimated concentration value.
"--" indicates not detected.

TABLE 13
SUMMARY OF DETECTED SURFACE WATER CONSTITUENTS FROM BUSH INDUSTRIES AREA

Location	SW-1	SW-2	SW-3	SW-3	SW-4
Sampling Event	2000/2001	2000/2001	2000/2001	2000/2001 Duplicate	2000/2001
Volatile Organics (ug/L)					
cis-1,2-Dichloroethene	--	--	12	12	--
Trichloroethene	--	--	19	18	--

NOTES:

See Figure 4 for sampling locations.

Shaded values exceed comparison criteria for surface water as indicated (see Table 3):

Exceeds human health - based values.

"--" indicates not detected.

"J" qualifier indicates estimated concentration value.

TABLE 14
SUMMARY OF DETECTED SURFACE WATER CONSTITUENTS FROM CATTARAUGUS CUTLERY AREA

Location / **Sampling Event**	SWCCA-1 1998 (approximately SWCCA-1S)	SWCCA-1N 1998 Round I	SWCCA-1N 1998 Round II Duplicate	SWCCA-2 1998 Round I	SWCCA-2 1998 Round II
Volatile Organics (ug/L)					
1,2-Dichloroethane	--	0.5 J	--	0.6 J	--

NOTES:

A sample was also collected from location SWCCA-1N during the 1998 Round II event. No constituents were detected in this sample.
A sample was also collected from location SWCCA-1S during the 1998 Round II event. No constituents were detected in this sample.
A sample was also collected from location SWCCA-1S during the 1998 Round I event. No constituents were detected in this sample.
A sample was also collected from location SWCCA-3 during the 1998 Round I event. No constituents were detected in this sample.
A sample was also collected from location SWCCA-3 during the 1998 Round II event. No constituents were detected in this sample.
See Figure 5 for sampling locations.
Shaded values exceed comparison criteria for surface water as indicated (see Table 3):
Exceeds human health - based values.
"J" qualifier indicates estimated concentration value.
"--" indicates not detected.

TABLE 15
SUMMARY OF DETECTED SURFACE WATER CONSTITUENTS ACROSS LITTLE VALLEY SUPERFUND SITE

Site Area	Great Triangle Area/ Envirotech Drum Storage	Great Triangle Area/ Western Burnt House	Great Triangle Area/ Winship Circle	South Luminite Area
Location	SW-EDSA	SW-WBH	SW-WIN	SW-LUMS
Sampling Event	2003	2003	2003	2003
Volatile Organics (ug/L)				
Trichloroethene	--	--	0.37 J	0.31 J

NOTES:

Samples were also collected from First Street (SW-1ST), King Windows (SW-2ND, duplicate SW-KWA), Ninth Street Landfill (SW-9TH), North Luminite (SW-LUMN), Luminite Plant (SW-LUMP), Railroad Avenue (SW-RRAA), State Street (SW-STATE), Great Triangle Area/Triangle Southwest (SW-TSW), and Whig Street (SW-WHIG) Areas. No constituents were detected in these samples.
See Figures 8, 12, and 14 for sampling locations.

None of the detected values exceed comparison criteria for surface water (see Table 3).

"--" indicates not detected.

"J" qualifier indicates estimated concentration value.

TABLE 16 MAXIMUM SEDIMENT AND SURFACE WATER TCE CONCENTRATIONS (MOST RECENT DATA)			
Area	**Maximum Sediment TCE Concentration (µg/L)**	**Maximum Surface Water TCE Concentration (µg/L)**	**Year**
Bush Industries	ND	19	2001
Cattaraugus Cutlery	ND	ND	1998
Great Triangle	NS	ND	2003
Luminite	NS	0.3	2003

Key:

ND=Not detected.
NS=No sediment samples collected.

TABLE 17
SUMMARY OF DETECTED GROUNDWATER CONSTITUENTS FROM NINTH STREET LANDFILL AREA

Location	SB9LF1	SB9LF1	LV-1	LV-1	LV-2A	LV-2A
Matrix	SimulProbe (~66')	SimulProbe (~70')	Groundwater	Groundwater	Groundwater	Groundwater
Sampling Event	1998	1998	1998 Round I	1998 Round II	1998 Round I	1998 Round II
Volatile Organics (ug/L)						
1,2-Dichloroethane	--	--	0.3 J	--	--	0.8 J
cis-1,2-Dichloroethene	--	--	--	--	0.2 J	--
Trichloroethene	10	19	--	--	--	--

NOTES:

See Figure 3 for sampling locations.

Shaded values exceed comparison criteria for groundwater as indicated (see Table 4):

Exceeds human health - based values.

Exceeds state values.

Exceeds both of the above values.

"J" qualifier indicates estimated concentration value.

"--" indicates not detected.

TABLE 18

SUMMARY OF DETECTED GROUNDWATER CONSTITUENTS FROM BUSH INDUSTRIES AREA

Location	SBBIA1	SBBIA1	SBBIA1	SBBIA1	SBBIA2	SBBIA2	SBBIA2
Matrix	SimulProbe (~45')	SimulProbe (~45')	SimulProbe (~50')	SimulProbe (~55')	SimulProbe (~45')	SimulProbe (~45')	SimulProbe (~50')
Sampling Event	1998	1998 Duplicate	1998	1998	1998	1998 Duplicate	1998
Volatile Organics (ug/L)							
1,1-Dichloroethene	--	--	--	--	--	--	--
1,2-Dichloroethane	--	--	--	--	--	--	--
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	--	--	--	--	--	--	0.6 **J**
trans-1,2-Dichloroethene	--	--	--	--	--	--	--
Trichloroethene	--	--	0.8 J	1	1	1	**6**
Vinyl chloride	--	--	--	--	--	--	--
Water Quality/MNA Parameters (mg/L)							
Alkalinity (as CaCO3)	NA	NA	NA	NA	NA	NA	NA
Chloride	NA	NA	NA	NA	NA	NA	NA
Methane	NA	NA	NA	NA	NA	NA	NA
Nitrate	NA	NA	NA	NA	NA	NA	NA
Sulfate	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	NA	NA	NA	NA	NA	NA	NA

Location	SBBIA2	SBBIA2	SBBIA3	SBBIA4	SBBIA5	SBBIA5	MW-1
Matrix	SimulProbe (~57')	SimulProbe (~60')	SimulProbe (~52')	SimulProbe (~45')	SimulProbe (~40')	SimulProbe (~47')	Groundwater
Sampling Event	1998	1998	1998	1998	1998	1998	2000/2001
Volatile Organics (ug/L)							
1,1-Dichloroethene	--	--	--	--	--	--	--
1,2-Dichloroethane	--	--	--	--	--	--	--
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	--	1 J	--	--	--	--	--
trans-1,2-Dichloroethene	--	--	--	--	--	--	--
Trichloroethene	3	**10**	1	--	--	--	--
Vinyl chloride	--	--	--	--	--	--	--
Water Quality/MNA Parameters (mg/L)							
Alkalinity (as CaCO3)	NA	NA	NA	NA	NA	NA	NA
Chloride	NA	NA	NA	NA	NA	NA	NA
Methane	NA	NA	NA	NA	NA	NA	NA
Nitrate	NA	NA	NA	NA	NA	NA	NA
Sulfate	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	NA	NA	NA	NA	NA	NA	NA

TABLE 18

SUMMARY OF DETECTED GROUNDWATER CONSTITUENTS FROM BUSH INDUSTRIES AREA

Location	MW-1	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2
Matrix	Groundwater/MNA	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater/MNA
Sampling Event	2003 Phase IV	PRP - May 1999	PRP - May 1999 Duplicate	PRP - Dec 1999	PRP - Dec 1999 Duplicate	2000/2001	2003 Phase IV
Volatile Organics (ug/L)							
1,1-Dichloroethene	--	1 J	--	0.7 J	0.7 J	--	0.63
1,2-Dichloroethane	--	--	--	--	--	--	--
1,2-Dichloroethene (total)	NA	**54**	**51**	**40**	**42**	NA	NA
cis-1,2-Dichloroethene	--	NA	NA	NA	NA	**44**	**40 D**
trans-1,2-Dichloroethene	--	NA	NA	NA	NA	--	0.28 J
Trichloroethene	--	**230**	**190**	**84**	**87**	**110**	**36 D**
Vinyl chloride	--	**4 J**	2 J	1 J	1 J	--	**4.8**
Water Quality/MNA Parameters (mg/L)							
Alkalinity (as CaCO3)	83	NA	NA	NA	NA	NA	180
Chloride	46	NA	NA	NA	NA	NA	19
Methane	0.07 JN	NA	NA	NA	NA	NA	0.54 JD
Nitrate	2	NA	NA	NA	NA	NA	--
Sulfate	11	NA	NA	NA	NA	NA	16
Total Organic Carbon	--	NA	NA	NA	NA	NA	2.6

Location	MW-3	MW-3	MW-3	MW-4	MW-4	MW-4	MW-5
Matrix	Groundwater	Groundwater	Groundwater/MNA	Groundwater	Groundwater	Groundwater	Groundwater
Sampling Event	PRP - May 1999	2000/2001	2003 Phase IV	PRP - May 1999	PRP - Dec 1999	2000/2001	2000/2001
Volatile Organics (ug/L)							
1,1-Dichloroethene	--	--	NA	--	--	--	--
1,2-Dichloroethane	--	--	--	--	--	--	--
1,2-Dichloroethene (total)	2 J	NA	--	--	0.7 J	NA	NA
cis-1,2-Dichloroethene	NA	3	2.2	NA	NA	--	--
trans-1,2-Dichloroethene	NA	--	--	NA	NA	--	--
Trichloroethene	5 J	**8**	**6.3**	2 J	1 J	0.9 J	--
Vinyl chloride	--	--	--	--	--	--	--
Water Quality/MNA Parameters (mg/L)							
Alkalinity (as CaCO3)	NA	NA	160	NA	NA	NA	NA
Chloride	NA	NA	44	NA	NA	NA	NA
Methane	NA	NA	0.07 JN	NA	NA	NA	NA
Nitrate	NA	NA	1.2	NA	NA	NA	NA
Sulfate	NA	NA	12	NA	NA	NA	NA
Total Organic Carbon	NA	NA	--	NA	NA	NA	NA

TABLE 18

SUMMARY OF DETECTED GROUNDWATER CONSTITUENTS FROM BUSH INDUSTRIES AREA

Location	MW-6	MW-6	MW-7	MW-7	MW-7	MW-8	MW-D1
Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater/MNA	Groundwater	Groundwater
Sampling Event	PRP - Dec 1999	2000/2001	PRP - Dec 1999	2000/2001	2003 Phase IV	2000/2001	PRP - May 1999
Volatile Organics (ug/L)							
1,1-Dichloroethene	--	--	--	--	NA	--	NA
1,2-Dichloroethane	--	--	--	--	--	--	--
1,2-Dichloroethene (total)	**30**	NA	0.3 J	NA	--	NA	**6 J**
cis-1,2-Dichloroethene	NA	**44**	NA	--	--	0.6 J	NA
trans-1,2-Dichloroethene	NA	--	NA	--	--	--	NA
Trichloroethene	**17**	**37**	2 J	0.9 J	0.75	4	**11**
Vinyl chloride	**4 J**	--	--	--	--	--	--
Water Quality/MNA Parameters (mg/L)							
Alkalinity (as CaCO3)	NA	NA	NA	NA	150	NA	NA
Chloride	NA	NA	NA	NA	44	NA	NA
Methane	NA	NA	NA	NA	0.08 JN	NA	NA
Nitrate	NA	NA	NA	NA	1	NA	NA
Sulfate	NA	NA	NA	NA	12	NA	NA
Total Organic Carbon	NA	NA	NA	NA	--	NA	NA

Location	MW-D1	MW-D1	MW-D1	MW-D2	MW-D2	MW-D2	MW-D2
Matrix	Groundwater	Groundwater	Groundwater/MNA	Groundwater	Groundwater	Groundwater	Groundwater
Sampling Event	PRP - Dec 1999	2000/2001	2003 Phase IV	PRP - May 1999	PRP - Dec 1999	2000/2001	2000/2001 Duplicate
Volatile Organics (ug/L)							
1,1-Dichloroethene	--	--	--	1 J	0.4 J	--	--
1,2-Dichloroethane	--	--	--	--	--	--	--
1,2-Dichloroethene (total)	4 J	NA	-- NA	**58**	**16**	NA	NA
cis-1,2-Dichloroethene	NA	**8**	4.8	NA	NA	**36**	**29**
trans-1,2-Dichloroethene	NA	--	--	NA	NA	--	--
Trichloroethene	**9 J**	**18**	**12**	**160**	**58**	**140**	**110**
Vinyl chloride	--	--	--	--	--	--	--
Water Quality/MNA Parameters (mg/L)							
Alkalinity (as CaCO3)	NA	NA	190	NA	NA	NA	NA
Chloride	NA	NA	42	NA	NA	NA	NA
Methane	NA	NA	0.06 JN	NA	NA	NA	NA
Nitrate	NA	NA	1.4	NA	NA	NA	NA
Sulfate	NA	NA	13	NA	NA	NA	NA
Total Organic Carbon	NA	NA	--	NA	NA	NA	NA

TABLE 18

SUMMARY OF DETECTED GROUNDWATER CONSTITUENTS FROM BUSH INDUSTRIES AREA

Location	MW-D2	MW-U1	LV-4	LV-4	LV-4	LV-7	LV-7
Matrix	Groundwater/MNA	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Sampling Event	2003 Phase IV	2000/2001	1998 Round I	1998 Round II	PRP - May 1999	1998 Round I	PRP - May 1999
Volatile Organics (ug/L)							
1,1-Dichloroethene	0.81	--	--	--	--	--	--
1,2-Dichloroethane	NA	--	--	--	--	0.3 J	--
1,2-Dichloroethene (total)	--	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	**18 D**	--	--	--	--	--	--
trans-1,2-Dichloroethene	--	--	--	--	--	--	NA
Trichloroethene	**78 D**	--	1	1	--	--	0.5 J
Vinyl chloride	--	--	--	--	--	--	--
Water Quality/MNA Parameters (mg/L)							
Alkalinity (as CaCO3)	130	NA	NA	NA	NA	NA	NA
Chloride	22	NA	NA	NA	NA	NA	NA
Methane	0.07 JN	NA	NA	NA	NA	NA	NA
Nitrate	0.29	NA	NA	NA	NA	NA	NA
Sulfate	15	NA	NA	NA	NA	NA	NA
Total Organic Carbon	2.4	NA	NA	NA	NA	NA	NA

NOTES:

Samples were also collected from location MW-1 during the PRP-May 99 and PRP-Dec 99 events. No constituents were detected in these samples.

Samples were also collected from location MW-5 during the PRP-May 99 and PRP-Dec 99 events. No constituents were detected in these samples.

Samples were also collected from location MW-U1 during the PRP-May 99 and PRP-Dec 99 events. No constituents were detected in these samples.

A sample was also collected from location LV-4 during the PRP-May 99 event. No constituents were detected in the sample.

Samples were also collected from location LV-7 during the 1998 Round I (one of the samples) and 1998 Round II events. No constituents were detected in these samples.

See Figure 4 for sampling locations.

Shaded values exceed comparison criteria for groundwater as indicated (see Table 4):

Exceeds human health - based values.

Exceeds state values.

Exceeds both of the above values.

"J" qualifier indicates estimated concentration value.

"N" qualifier indicates presumptive evidence exists for the presence of the constituent.

"--" indicates not detected.

"NA" indicates not analyzed/not applicable.

TABLE 19
SUMMARY OF DETECTED GROUNDWATER CONSTITUENTS FROM CATTARAUGUS CUTLERY AREA

Location	SBCCA-1	SBCCA-2	SBCCA-3	CCAGEO-1	CCAGEO-1	CCAGEO-2	CCAGEO-3
Matrix	SimulProbe (~30')	SimulProbe (~6')	SimulProbe (~33')	Hydropunch (~34')	Hydropunch (~34')	Hydropunch (~30')	Hydropunch (~30')
Sampling Event	1998	1998	1998	2003 Phase IV	2003 Phase IV Duplicate	2003 Phase IV	2003 Phase IV
Volatile Organics (ug/L)							
1,2-Dichloroethane	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	1	--	--	--	--	0.7	0.72
Trichloroethene	36 D	9 J	12	0.79	0.9	63 D	76 D
Water Quality/MNA Parameters (mg/L)							
Alkalinity (as CaCO3)	NA	NA	NA	NA	NA	NA	NA
Chloride	NA	NA	NA	NA	NA	NA	NA
Methane	NA	NA	NA	NA	NA	NA	NA
Nitrate	NA	NA	NA	NA	NA	NA	NA
Sulfate	NA	NA	NA	NA	NA	NA	NA
TOC	NA	NA	NA	NA	NA	NA	NA

Location	CCAGEO-4	CCAGEO-5	CCAGEO-6	MWCCA-1	MWCCA-1	MWCCA-1	MWCCA-2
Matrix	Hydropunch (~30')	Hydropunch (~30')	Hydropunch (~30')	Groundwater	Groundwater	Groundwater	Groundwater
Sampling Event	2003 Phase IV	2003 Phase IV	2003 Phase IV	1998 Round I	1998 Round I Duplicate	1998 Round II	1998 Round I
Volatile Organics (ug/L)							
1,2-Dichloroethane	--	--	--	--	--	--	NA
cis-1,2-Dichloroethene	--	--	--	0.2 J	0.2 J	0.5 J	NA
Trichloroethene	62 D	76 D	23	3	3	7	NA
Water Quality/MNA Parameters (mg/L)							
Alkalinity (as CaCO3)	NA	NA	NA	NA	NA	NA	NA
Chloride	NA	NA	NA	NA	NA	NA	NA
Methane	NA	NA	NA	NA	NA	NA	NA
Nitrate	NA	NA	NA	NA	NA	NA	NA
Sulfate	NA	NA	NA	NA	NA	NA	NA
TOC	NA	NA	NA	NA	NA	NA	NA

TABLE 19
SUMMARY OF DETECTED GROUNDWATER CONSTITUENTS FROM CATTARAUGUS CUTLERY AREA

Location	MWCCA-2	MWCCA-2	MWCCA-2	MWCCA-2	MWCCA-2	MWCCA-3	MWCCA-3
Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater/MNA	Groundwater	Groundwater
Sampling Event	1998 Round II	1998 Round II	1999 Round I	1999 Round II	2003 Phase IV	1998 Round I	1998 Round I Duplicate
Volatile Organics (ug/L)							
1,2-Dichloroethane	--	--	0.4 J	--	--	--	NA
cis-1,2-Dichloroethene	--	--	--	--	--	2	NA
Trichloroethene	12	12	8	3	9.8	71 D	NA
Water Quality/MNA Parameters (mg/L)							
Alkalinity (as CaCO3)	NA	NA	NA	NA	130 J	NA	NA
Chloride	NA	NA	NA	NA	12	NA	NA
Methane	NA	NA	NA	NA	0.07 JN	NA	NA
Nitrate	NA	NA	NA	NA	0.5	NA	NA
Sulfate	NA	NA	NA	NA	20	NA	NA
TOC	NA	NA	NA	NA	--	NA	NA

Location	MWCCA-3	MWCCA-3	MWCCA-3	MWCCA-4	MWCCA-4	MWCCA-4	MWCCA-5
Matrix	Groundwater	Groundwater	Groundwater/MNA	Groundwater	Groundwater	Groundwater/MNA	Groundwater
Sampling Event	1998 Round II	1998 Round II Duplicate	2003 Phase IV	1999 Round I	1999 Round II	2003 Phase IV	1999 Round I
Volatile Organics (ug/L)							
1,2-Dichloroethane	--	NA	--	--	--	--	--
cis-1,2-Dichloroethene	3	NA	3.7	--	--	--	--
Trichloroethene	67 D	NA	58 D	--	--	--	3
Water Quality/MNA Parameters (mg/L)							
Alkalinity (as CaCO3)	NA	NA	160	NA	NA	150	NA
Chloride	NA	NA	18	NA	NA	110	NA
Methane	NA	NA	0.07 JN	NA	NA	0.08 JN	NA
Nitrate	NA	NA	0.51	NA	NA	0.79	NA
Sulfate	NA	NA	19	NA	NA	78 L	NA
TOC	NA	NA	--	NA	NA	--	NA

TABLE 19

SUMMARY OF DETECTED GROUNDWATER CONSTITUENTS FROM CATTARAUGUS CUTLERY AREA

Location	MWCCA-5	MWCCA-5	MWCCA-6	MWCCA-6	MWCCA-6	MWCCA-6	MWCCA-6
Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater/MNA	Groundwater/MNA
Sampling Event	1999 Round I Duplicate	1999 Round II	1999 Round I	1999 Round II	1999 Round II Duplicate	2003 Phase IV	2003 Phase IV Duplicate
Volatile Organics (ug/L)							
1,2-Dichloroethane	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	--	--	0.5 J	2	2	--	--
Trichloroethene	2	1	31 D	62 D	62 D	0.2 J	0.22 J
Water Quality/MNA Parameters (mg/L)							
Alkalinity (as CaCO3)	NA	NA	NA	NA	NA	130	130
Chloride	NA	NA	NA	NA	NA	14	4.8
Methane	NA	NA	NA	NA	NA	0.05 JN	0.03 JN
Nitrate	NA	NA	NA	NA	NA	0.59	0.59
Sulfate	NA	NA	NA	NA	NA	16	5.1 L
TOC	NA	NA	NA	NA	NA	--	1.3

Location	MWCCA-7	MWCCA-7	MWCCA-8	MWCCA-9D	MWCCA-10	MWCCA-11D	MWCCA-12
Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Sampling Event	1999 Round I	1999 Round II	2000/2001	2003 Phase IV	2003 Phase IV	2003 Phase IV	2003 Phase IV
Volatile Organics (ug/L)							
1,2-Dichloroethane	--	--	--	1.1	1.2	--	--
cis-1,2-Dichloroethene	--	--	--	--	--	--	--
Trichloroethene	0.8 J	2	--	1.4	1.4	--	**11**
Water Quality/MNA Parameters (mg/L)							
Alkalinity (as CaCO3)	NA	NA	NA	NA	NA	NA	NA
Chloride	NA	NA	NA	NA	NA	NA	NA
Methane	NA	NA	NA	NA	NA	NA	NA
Nitrate	NA	NA	NA	NA	NA	NA	NA
Sulfate	NA	NA	NA	NA	NA	NA	NA
TOC	NA	NA	NA	NA	NA	NA	NA

TABLE 19
SUMMARY OF DETECTED GROUNDWATER CONSTITUENTS FROM CATTARAUGUS CUTLERY AREA

Location	MWCCA-12	Production Well	Production Well	LV-3	PZ-20D
Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater/MNA
Sampling Event	2003 Phase IV Duplicate	1999 Round I	1999 Round II	1998 Round I	2003 Phase IV
Volatile Organics (ug/L)					
1,2-Dichloroethane	1.2	--	--	0.3 J	--
cis-1,2-Dichloroethene	--	--	--	--	--
Trichloroethene	**10**	--	--	--	--
Water Quality/MNA Parameters (mg/L)					
Alkalinity (as CaCO3)	NA	NA	NA	NA	280
Chloride	NA	NA	NA	NA	51
Methane	NA	NA	NA	NA	0.07 JN
Nitrate	NA	NA	NA	NA	1.5
Sulfate	NA	NA	NA	NA	19
TOC	NA	NA	NA	NA	1.5 J

TABLE 19
SUMMARY OF DETECTED GROUNDWATER CONSTITUENTS FROM CATTARAUGUS CUTLERY AREA

NOTES:

A sample was also collected from location LV-3 during the 1998 Round II event. No constituents were detected in the sample.

See Figure 5 for sampling locations.

Shaded values exceed comparison criteria for groundwater as indicated (see Table 4):

- Exceeds human health - based values.
- Exceeds state values.
- Exceeds both of the above values.

"J" qualifier indicates estimated concentration value.

"N" qualifier indicates presumptive evidence exists for the presence of the constituent.

"--" indicates not detected.

"NA" indicates not analyzed/not applicable.

TABLE 20
SUMMARY OF DETECTED GROUNDWATER CONSTITUENTS FROM KING WINDOWS (SECOND STREET) AREA

Location	LV-9	Production Well	Production Well	Production Well
Matrix	Groundwater	Groundwater	Groundwater	Groundwater
Sampling Event	1998 Round I	1998 Round I	1998 Round I Duplicate	1998 Round II
Volatile Organics (ug/L)				
Trichloroethene	--	3	2	2

NOTES:

A sample was also collected from well LV-9 during the 1998 Round II event. No constituents were detected in this sample.

See Figure 6 for sampling locations.

None of the detected values exceed comparison criteria for groundwater (see Table 4).

"--" indicates not detected.

TABLE 21

SUMMARY OF DETECTED GROUNDWATER CONSTITUENTS FROM GREAT TRIANGLE AREA

Location	SBGTA1	SBGTA1	SBGTA2	SBGTA2	MWEDSA-1	LV-8	PZ-5	PZ-6D
Matrix	SimulProbe (~79')	SimulProbe (~84')	SimulProbe (~22')	SimulProbe (~30')	Groundwater/MNA	Groundwater	Groundwater/MNA	Groundwater/MNA
Sampling Event	1998	1998	1998	1998 Duplicate	2003 Phase IV	1998 Round I	2003 Phase IV	2003 Phase IV
Volatile Organics (ug/L)								
Trichloroethene	R	4 J	--	--	**14**	0.3 J	**6.6**	**6.9**
Water Quality/MNA Parameters (mg/L)								
Alkalinity (as CaCO3)	NA	NA	NA	NA	ERR	NA	170	150
Chloride	NA	NA	NA	NA	19	NA	14	12
Methane	NA	NA	NA	NA	0.07 JN	NA	0.06 J N	0.07 J N
Nitrate	NA	NA	NA	NA	0.3	NA	1.6	1.1
Sulfate	NA	NA	NA	NA	97	NA	39	37
TOC	NA	NA	NA	NA	3	NA	--	--

Location	PZ-47D	PZ-47D	PZ-47D	PZ-48	PZ-48
Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Sampling Event	1998 Round I	1998 Round II	2002	1998 Round I	2002
Volatile Organics (ug/L)					
Trichloroethene	0.4 J	0.5 J	1.6	**6**	3.4
Water Quality/MNA Parameters (mg/L)					
Alkalinity (as CaCO3)	NA	NA	NA	NA	NA
Chloride	NA	NA	NA	NA	NA
Methane	NA	NA	NA	NA	NA
Nitrate	NA	NA	NA	NA	NA
Sulfate	NA	NA	NA	NA	NA
TOC	NA	NA	NA	NA	NA

TABLE 21

SUMMARY OF DETECTED GROUNDWATER CONSTITUENTS FROM GREAT TRIANGLE AREA

NOTES:

Samples were also collected from location SBGTA2 by SimulProbe™ at approximately 30 feet bgs and 35 feet bgs. No constituents were detected in these samples.

A groundwater sample was also collected from location LV-8 during 1998 Round II. No constituents were detected in this sample.

See Figure 7 for sampling locations.

Shaded values exceed comparison criteria for groundwater as indicated (see Table 4):

- Exceeds human health - based values.
- Exceeds state values.
- Exceeds both of the above values.

"J" qualifier indicates estimated concentration value.

"NA" indicates not analyzed/not applicable.

TABLE 22
SUMMARY OF DETECTED GROUNDWATER CONSTITUENTS FROM WHIG STREET AREA

Location	WSA1	WSA1	PZ-39	PZ-45D
Matrix	SimulProbe (~30')	SimulProbe (~35')	Groundwater/MNA	Groundwater/MNA
Sampling Event	1998	1998	2003 Phase IV	2003 Phase IV
Volatile Organics (ug/L)				
Trichloroethene	--	0.6 J	--	2.1
Water Quality/MNA Parameters (mg/L)				
Alkalinity (as CaCO3)	NA	NA	100	6300 J
Chloride	NA	NA	19	16
Methane	NA	NA	0.07 J N	0.06 J N
Nitrate	NA	NA	2.4	0.06
Sulfate	NA	NA	**350**	29
Total Volatile TICs	NA	NA	3.2	9.2 J

NOTES:

See Figure 13 for sampling locations.

Shaded values exceed comparison criteria for groundwater as indicated (see Table 4):

Exceeds human health - based values.

Exceeds state values.

Exceeds both of the above values.

"J" qualifier indicates estimated concentration value.

"N" qualifier indicates presumptive evidence exists for the presence of the constituent.

"NA" indicates not analyzed.

"--" indicates not detected.

TABLE 23
SUMMARY OF DETECTED GROUNDWATER CONSTITUENTS FROM LUMINITE AREA

Location	PZ-36	PZ-36	PZ-42	PZ-42	PZ-43	PZ-43	PZ-43
Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Sampling Event	1998 Round I	1998 Round II	1998 Round I	1998 Round II	1998 Round I	1998 Round II	1998 Round II Duplicate
Volatile Organics (ug/L)							
Trichloroethene	8	6	2	2	2	0.5 J	0.5 J
Water Quality/MNA Parameters (mg/L)							
Alkalinity (as CaCO3)	NA	NA	NA	NA	NA	NA	NA
Chloride	NA	NA	NA	NA	NA	NA	NA
Methane	NA	NA	NA	NA	NA	NA	NA
Nitrate	NA	NA	NA	NA	NA	NA	NA
Sulfate	NA	NA	NA	NA	NA	NA	NA
TOC	NA	NA	NA	NA	NA	NA	NA

NOTES:

See Figures 10 and 14 for sampling locations.

Shaded values exceed comparison criteria for groundwater as indicated (see Table 4):

Exceeds human health - based values.

Exceeds state values.

Exceeds both of the above values.

"J" qualifier indicates estimated concentration value.

"NA" indicates not analyzed.

"N" qualifier indicates presumptive evidence exists for the presence of the constituent.

"--" indicates not detected.

TABLE 23
SUMMARY OF DETECTED GROUNDWATER CONSTITUENTS FROM LUMINITE AREA

Location	PZ-46	PZ-51	PZ-51	PZ-55D	PZ-59	PZ59	PZ-60D	PZ-60D	PZ-60D
Matrix	Groundwater/MNA	Groundwater	Groundwater	Groundwater/MNA	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Sampling Date	2003 Phase IV	1998 Round I	1998 Round II	2003 Phase IV	1998 Round I	1998 Round II	1998 Round I	1998 Round I Duplicate	1998 Round II
Volatile Organics (ug/L)									
Trichloroethene	--	8	8	4.4 J	8	7	10	10	8
Water Quality/MNA Parameters (mg/L)									
Alkalinity (as CaCO3)	68	NA	NA	470 J	NA	NA	NA	NA	NA
Chloride	17	NA	NA	39	NA	NA	NA	NA	NA
Methane	0.07 JN	NA	NA	0.04 JN	NA	NA	NA	NA	NA
Nitrate	1.3	NA	NA	1.5	NA	NA	NA	NA	NA
Sulfate	9	NA	NA	14	NA	NA	NA	NA	NA
TOC	--	NA	NA	1.9	NA	NA	NA	NA	NA

NOTES:

See Figures 10 and 14 for sampling locations.

Shaded values exceed comparison criteria for groundwater as indicated (see Table 4):

Exceeds human health - based values.

Exceeds state values.

Exceeds both of the above values.

"J" qualifier indicates estimated concentration value.

"NA" indicates not analyzed.

"N" qualifier indicates presumptive evidence exists for the presence of the constituent.

"--" indicates not detected.

TABLE 24

SUMMARY OF DETECTED GROUNDWATER CONSTITUENTS FROM RAILROAD AVENUE AREA

Location	RRAAGEO-1	RRAAGEO-1	RRAAGEO-1	RRAAGEO-3	RRAAGEO-3	RRAAGEO-3
Matrix	Hydropunch (~32')	Hydropunch (~40')	Hydropunch (~72')	Hydropunch (~40')	Hydropunch (~56')	Hydropunch (~72')
Sampling Date	2003 Phase IV	2003 Phase IV	2003 Phase IV	2003 Phase IV	2003 Phase IV	2003 Phase IV
Volatile Organics (ug/L)						
cis-1,2-Dichloroethene	--	--	--	--	--	--
Trichloroethene	0.22 J	--	0.57	--	--	1.1

Location	RRAAGEO-4	RRAAGEO-4	RRAAGEO-5	RRAAGEO-8	RRAAGEO-8	RRAAGEO-9
Matrix	Hydropunch (~40')	Hydropunch (~70')	Hydropunch (~30')	Hydropunch (~30')	Hydropunch (~40')	Hydropunch (~50')
Sampling Date	2003 Phase IV	2003 Phase IV	2003 Phase IV	2003 Phase IV	2003 Phase IV	2003 Phase IV
Volatile Organics (ug/L)						
cis-1,2-Dichloroethene	--	--	**6.2**	--	--	--
Trichloroethene	--	--	--	--	--	--

Location	RRAAGEO-9	RRAAGEO-9	RRAAGEO-10	RRAAGEO-10	RRAAGEO-10	RRAAGEO-11
Matrix	Hydropunch (~60')	Hydropunch (~70')	Hydropunch (~30')	Hydropunch (~60')	Hydropunch (~70	Hydropunch (~60')
Sampling Date	2003 Phase IV	2003 Phase IV	2003 Phase IV	2003 Phase IV	2003 Phase IV	2003 Phase IV
Volatile Organics (ug/L)						
cis-1,2-Dichloroethene	--	--	--	--	--	--
Trichloroethene	0.26 J	1	--	--	0.5	--

Location	RRAAGEO-12	RRAAGEO-12	MWRRAA-1	MWRRAA-2D
Matrix	Hydropunch (~60')	Hydropunch (~70')	Groundwater	Groundwater
Sampling Date	2003 Phase IV	2003 Phase IV	2003 Phase IV	2003 Phase IV
Volatile Organics (ug/L)				
cis-1,2-Dichloroethene	--	--	--	--
Trichloroethene	0.31 J	1.9	--	--

TABLE 24

SUMMARY OF DETECTED GROUNDWATER CONSTITUENTS FROM RAILROAD AVENUE AREA

NOTES:

Samples were also collected from the following locations and depths. No constituents were detected in these samples.

- Location RRAAGEO-2 at 50 feet, 60 feet and 70 feet.
- Location RRAAGEO-4 at 30 feet.
- Location RRAAGEO-5 at 50 feet and 70 feet.
- Location RRAAGEO-6 at 50 feet, 60 feet and 70 feet.
- Location RRAAGEO-7 at 30 feet, 50 feet and 70 feet.
- Location RRAAGEO-8 at 70 feet.
- Location RRAAGEO-11 at 50 feet and 70 feet.
- Location RRAAGEO-12 at 40 feet.

See Figure 16 sampling locations.

Shaded values exceed comparison criteria for groundwater as indicated (see Table 4):

Exceeds state values.

"--" indicates not detected.

"J" qualifier indicates estimated concentration value.

TABLE 25 MAXIMUM GROUNDWATER TCE CONCENTRATIONS (MOST RECENT DATA)		
Area	**Maximum TCE Concentration (µg/L)**	**Year**
Bush Industries	78	2003
Cattaraugus Cutlery	76	2003
King Windows	2	1998
First Street	ND	1998
Great Triangle	14	2003
Whig Street	2.1	2003
Luminite	4.4	2003
Ninth Street Landfill	19	1998
State Street	AE	AE
Railroad Avenue	1.9	2003

Key:

ND=Not detected.
AE=Area eliminated from consideration based on 1997 soil gas screening results. No groundwater samples were collected.

TABLE 27

TCE SAMPLING RESULTS FOR HOMES WITHOUT TREATMENT SYSTEMS IN PARTS PER BILLION (ppb)

LITTLE VALLEY SUPERFUND SITE

ID #	1989 - 1996 Historical Range	January 1997	November 1997	October 1998	Fall 1999	April 2001
16	ND	ND	ND	0.5	ND	-----
20	ND	ND	ND	-----	ND	ND
22	ND	ND	ND	-----	-----	ND
23	ND - 0.5	0.4	ND	0.5	0.5	0.3
24	ND	0.5	ND	-----	0.5	0.3
25	2.0	1.5	-----	1.5	1.0	-----
26	1 - 3	1.2	1.2	1.6	1.9	0.9
27	9.3 - 25	13.7	-----	13 (refused)	-----	-----
31	ND	ND	ND	0.5	ND	ND
34	ND	-----	-----	0.5	-----	ND
37	ND	ND	ND	2.7	ND	-----
38	3	0.7	3.0	2.7	2.7	1.8
39	8 - 9.4	2.4	-----	0.9	ND	0.6
50	ND	ND	ND	-----	ND	-----
52	ND	ND	ND	0.5	ND	ND
55	2 - 2.8	3.0	-----	0.5	3.1	2.5
56	ND - 0.5	0.5	-----	0.5	0.5	0.3
58	ND - 0.5	ND	-----	-----	ND	-----
59	1	1.0	-----	-----	1.0	0.8
60	ND	-----	ND	-----	0.4	-----
61	ND	ND	-----	-----	-----	-----
66	ND	ND	ND	0.5	-----	-----
67	ND	ND	ND	0.5	ND	ND
68	ND	ND	ND	-----	ND	ND
69	2	2.6	-----	1.7	1.0	1.6
70	ND	ND	ND	0.7	ND	ND
71	2	3.0	-----	-----	ND	ND
72	1	1.2	-----	0.9	1.0	0.9
73	ND	-----	-----	-----	-----	-----
93	ND	ND	-----	-----	ND	ND
94	ND	ND	ND	0.5	ND	ND
97	9.4	7.7	2.7	-----	-----	6.24 (non-pot.)

----- Not sampled.
ND Result not detected.
* Result likely reflects a mix up of pre-treated and post-treated water samples.

TABLE 27

TCE SAMPLING RESULTS FOR HOMES WITHOUT TREATMENT SYSTEMS IN PARTS PER BILLION (ppb)

LITTLE VALLEY SUPERFUND SITE

ID #	1989 - 1996 Historical Range	January 1997	November 1997	October 1998	Fall 1999	April 2001
98	2.6	2.7	-----	1.7	2.6	1.5
100	ND	ND	ND	0.5	0.5	ND
101	1 - 2.1	2.3	2.1	-----	2.0	-----
102	5.8	-----	-----	-----	-----	-----
103	ND	ND	ND	0.5	0.5	ND
112	1.4	1.7	-----	1.4	3.0	2.5
113	2.1	2.6	-----	1.6	1.7	1.7
114	ND	ND	ND	0.5	ND	ND
115	ND	ND	ND	-----	ND	-----
116	ND	ND	ND	0.5	ND	ND
123	-----	1.2	-----	0.9	1.2	1.0
126	-----	1.2	-----	1.3	1.3	0.9
128	-----	2.3	-----	2.0	2.4	1.9
129	-----	5.6	-----	-----	-----	-----
130	-----	ND	ND	-----	0.4	ND
131	-----	7.5	-----	7.5 (refuse)	8.2	6.8
132	-----	ND	ND	0.5	ND	ND
138	-----	ND	ND	0.5	ND	ND
139	-----	ND	ND	-----	ND	-----
140	-----	-----	-----	-----	-----	-----
141	-----	ND	ND	-----	0.5	-----
142	-----	ND	ND	0.5	ND	-----
143	-----	ND	ND	0.5	ND	-----
144	-----	ND	ND	0.5	ND	ND
145	-----	-----	-----	-----	7.5	-----
146	-----	-----	-----	-----	0.5	ND
147	-----	ND	ND	0.5	-----	-----
148	-----	ND	ND	0.5	ND	ND
149	-----	ND	ND	-----	ND	ND
150	-----	ND	ND	0.5	ND	ND
151	-----	ND	ND	-----	-----	-----
152	-----	ND	ND	0.5	ND	ND

----- Not sampled.

ND Result not detected.

* Result likely reflects a mix up of pre-treated and post-treated water samples.

TABLE 27

TCE SAMPLING RESULTS FOR HOMES WITHOUT TREATMENT SYSTEMS IN PARTS PER BILLION (ppb)

LITTLE VALLEY SUPERFUND SITE

ID #	1989 - 1996 Historical Range	January 1997	November 1997	October 1998	Fall 1999	April 2001
155	-----	ND	ND	0.5	ND	-----
156	-----	ND	ND	0.5	ND	ND
158	-----	ND	ND	0.5	ND	ND
159	-----	ND	ND	-----	ND	ND
160	-----	ND	ND	0.5	ND	ND
161	-----	ND	ND	-----	ND	-----
165	-----	6.2	-----	-----	0.5	-----
167	-----	-----	-----	-----	-----	-----
169	-----	ND	ND	-----	0.5	-----
175	-----	14.9	-----	-----	-----	ND
179	-----	-----	-----	-----	-----	-----
180	-----	3.3	-----	-----	3.5	2.7
181	-----	1.6	-----	1.5	2.1	1.1
182	-----	-----	ND	0.8	1.0	0.4
183	-----	0.5	-----	0.5	1.1	1.0
188	-----	-----	-----	-----	-----	-----
190	-----	ND	ND	-----	ND	ND
191	-----	ND	ND	-----	-----	-----
192	-----	ND	ND	-----	-----	ND
193	-----	ND	ND	-----	ND	ND
194	-----	ND	ND	-----	-----	ND
196	-----	3.3	-----	3.0	3.0	2.7
197	-----	ND	ND	-----	ND	ND
198	-----	ND	ND	0.5	ND	-----
199	-----	ND	ND	-----	ND	ND
200	-----	0.7	-----	0.5	-----	-----
201	-----	ND	ND	-----	2.9	-----
202	-----	4.5	-----	-----	-----	-----
203	-----	2.7	-----	2.1	2.7	2.1
208	-----	-----	-----	-----	-----	ND
209	-----	-----	-----	-----	-----	ND

----- Not sampled.

ND Result not detected.

* Result likely reflects a mix up of pre-treated and post-treated water samples.

TABLE 26
TCE SAMPLING RESULTS FOR HOMES WITH TREATMENT SYSTEMS IN PARTS PER BILLION (ppb)
LITTLE VALLEY SUPERFUND SITE

ID #	1989 - 1996	January 1997	November 1997		Oct. 98 / Feb. 99		May 1999		October 2000	March 2001		October 2002		October 2003		October 2004	
	Range	Pre-Install.	Pre-Treat.	Post-Treat.	Pre-Treat.	Post-Treat.	Pre-Treat.	Post-Treat.	Post-Treat.	Pre-Treat.	Post-Treat.	Pre-Treat.	Post-Treat.	Pre-Treat.	Post-Treat.	Pre-Treat.	Post-Treat.
1	ND - 12	8.63	-----	-----	6.6	ND	-----	-----	-----	6.6	1.4	7	ND	6	ND	5	ND
2	ND - 22	8.61	-----	-----	8.5	ND	-----	-----	ND	-----	-----	7	ND	7	ND	6	ND
3	4 - 9.6	9.46	10	ND	7.1	ND	-----	-----	ND	7.7	ND	7	ND	0.6	ND	6	ND
4	5	9.3	-----	-----	9.5	-----	7.5	ND	ND	7.5	ND	8	ND	7	ND	6	ND
5	5 - 15	8.49	9.2	ND	7.2	ND	-----	-----	ND	7.0	ND	8	ND	6	ND	5	ND
6	4	5.95	4.7	ND	5.4	ND	-----	-----	ND	4.6	ND	3	ND	4	ND	3	ND
8	3 - 11	6.33	6	ND	5.5	ND	-----	-----	ND	5.6	ND	6	ND	5	ND	4	ND
9	7.2 - 16	10.4	8.2	ND	7.9	ND	-----	-----	ND	8.1	ND	6	ND	-----	-----	5	ND
10	3 - 11	1.49	-----	-----	10	-----	-----	-----	ND	-----	-----	1	ND	0.9	ND	0.6	ND
11	6.3 - 9	6.58	5.6	ND	6.4	ND	-----	-----	ND	4.8	ND	5	ND	4	ND	3	ND
12	14	12.4	8.7	ND	9.4, 12	ND	-----	-----	ND	8.7	ND	7	ND	7	ND	5	ND
13	8	8.08	4.4	ND	7.1	ND	-----	-----	ND	5.8	ND	6	ND	5	ND	4	ND
14	ND - 7.7	7.77	8	ND	6.3	ND	-----	-----	ND	6.2	ND	6	ND	5	ND	5	ND
15	7.4 - 11	8.63	7	ND	8.9	ND	-----	-----	ND	5.6	ND	6	6	ND	ND	5	ND
17	12	8.57	8.5	ND	7.1	ND	-----	-----	ND	-----	-----	7	ND	8	ND	5	ND
18	7 - 20	8.6	7.8	ND	7.6	ND	-----	-----	ND	6.8	ND	7	ND	6	ND	6	ND
19	3.6 - 13	4.36	4.3	ND	4.2	ND	-----	-----	ND	6.1	ND	6	ND	6	ND	5	ND
21	8 - 50	22.9	-----	ND	29	ND	-----	-----	ND	18.5	ND	21	ND	24	ND	20	ND
28	18	14.1	11.7	ND	12	ND	-----	-----	ND	ND	ND	8	ND	8	ND	7	ND
29	9.7 - 18	7.95	6.3	ND	7.6	ND	-----	-----	ND	3.6	3.9	6	ND	ND	ND	3	ND
30	8	6.52	5.9	ND	3.9	ND	-----	-----	ND	5.6	ND	5	ND	5	ND	4	ND
32	3 - 8	5.52	5.6	ND	4.2	ND	-----	-----	ND	4.6	4.5	4	ND	4	ND	3	ND
33	4 - 11	7.38	5.4	ND	5.9	ND	-----	-----	ND	6.2	ND	5	ND	5	ND	4	ND
35	23 - 31	18.1	17.1	ND	18	ND	15	ND	ND	14.0	-----	14	ND	13	ND	12	ND
36	12 - 21	14.8	13.6	ND	12	ND	-----	-----	ND	10.7	ND	10	ND	11	ND	10	ND
40	19	10.7	10.5	ND	11	ND	-----	-----	ND	8.4	ND	7	ND	-----	-----	6	ND
44	ND - 16	ND	ND	ND	ND	ND	-----	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND
45	20 - 33	23.7	22.5	ND	24	ND	-----	-----	ND	-----	-----	ND	ND	23	ND	16	ND
46	32	16.3	28.8	ND	30	ND	-----	-----	-----	-----	-----	20	ND	24	ND	20	ND
47	19	-----	-----	-----	23, 22	ND	22	ND	6.84	17.6	ND	18	ND	19	ND	----	----
51	7	5.58	6	ND	4.7	ND	-----	-----	ND	5.0	ND	5	ND	4	ND	3	ND
53	33	20	19.2	ND	28	ND	-----	-----	ND	13.2	ND	16	ND	15	ND	15	ND
54	5.2 - 10	5.64	----	-----	4	ND	-----	-----	ND	5.4	ND	5	ND	4	ND	3	ND
57	7.5 - 19	6.06	7.7	ND	5.8	ND	-----	-----	ND	4.2	ND	5	ND	6	ND	4	ND
62	7	9.72	11.6	ND	2.2	ND	-----	-----	ND	6.1	ND	6	ND	6	ND	4	ND
64	11 - 30	12.9	9.3	ND	12	ND	-----	-----	ND	9.0	ND	8	ND	9	ND	8	ND
65	33	22.7	25.2	ND	4.1	ND	-----	-----	ND	15.3	ND	17	ND	21	ND	22	ND
79	9 - 18	11.2	8.5	ND	1.6	ND	-----	-----	ND	7.2	ND	7	ND	7	ND	5	ND
86	17	12	9.9	ND	9.6	ND	-----	-----	ND	7.9	ND	-----	-----	6	ND	6	ND
87	17	10.8	9.6	ND	9.7	ND	-----	-----	ND	8.6	ND	8	ND	6	ND	5	ND
91	9.9	9.84	9.1	ND	8	ND	-----	-----	2.2	7.2	2.3	6	ND	7	ND	6	ND

----- Not sampled .
ND Result not detected.
* Result likely reflects a mix up of pre-treated and post-treated water samples.

TABLE 26
TCE SAMPLING RESULTS FOR HOMES WITH TREATMENT SYSTEMS IN PARTS PER BILLION (ppb)
LITTLE VALLEY SUPERFUND SITE

ID #	1989 - 1996	January 1997	November 1997		Oct. 98 / Feb. 99		May 1999		October 2000	March 2001		October 2002		October 2003		October 2004	
	Range	Pre-Install.	Pre-Treat.	Post-Treat.	Pre-Treat.	Post-Treat.	Pre-Treat.	Post-Treat.	Post-Treat.	Pre-Treat.	Post-Treat.	Pre-Treat.	Post-Treat.	Pre-Treat.	Post-Treat.	Pre-Treat.	Post-Treat.
92	17.3	17.3	16.1	ND	6.2	ND	-----	-----	ND	12.0	-----	12	ND	13	ND	3	ND
95	6.5	8.75	6.9	ND	7.7	ND	-----	-----	ND	7.3	ND	6	ND	6	ND	4	ND
96	10.2	12	9.1	ND	9.1	ND	-----	-----	4.5	9.5	ND	7	ND	7	ND	6	ND
99	6.4	6.49	6.1	ND	6.6	ND	-----	-----	ND	5.5	ND	4	ND	4	ND	3	ND
104	11	13.3	10.6	ND	13	ND	-----	-----	-----	9.5	-----	8	ND	9	ND	9	ND
105	9.5	9.38	8.5	ND	9.8	ND	-----	-----	8.5	8.8	ND	7	ND	7	ND	6	ND
106	11	9.91	9.8	ND	8.8	ND	-----	-----	-----	-----	-----	7	ND	8	ND	6	ND
107	11 - 28.6	12	12.5	ND	9.7	ND	9.7	ND	ND	9.6	ND	8	ND	8	ND	7	ND
108	12	11.9	10.5	ND	11	ND	-----	-----	ND	10.0	ND	8	ND	4	ND	4	ND
109	12	13.8	-----	-----	8.9	ND	-----	-----	ND	-----	-----	9	ND	7	ND	6	ND
110	11	11.5	10.4	ND	12	ND	-----	-----	ND	10.1	-----	9	ND	10	ND	8	ND
111	4.6	5.25	4	ND	4.1	ND	-----	-----	ND	3.7	ND	3	ND	ND *	3 *	2	ND
117	19.9	20.5	23.3	ND	29	ND	-----	-----	-----	15.6	ND	17	ND	17	ND	15	ND
118	9.2	9.82	8.4	ND	1.1	ND	-----	-----	ND	7.9	ND	7	ND	7	ND	6	ND
119	11	10.3	-----	-----	ND	ND	-----	-----	ND	8.3	ND	7	ND	6	ND	5	ND
120	10	12.3	10.7	ND	10	ND	-----	-----	ND	9.3	ND	8	ND	7	ND	6	ND
121	11	10.7	12.1	ND	12	ND	-----	-----	ND	7.8	ND	8	ND	7	ND	6	ND
122	7.2	7.43	6.9	ND	6.4	ND	-----	-----	ND	-----	-----	5	ND	6	ND	6	ND
125	-----	5.5	5.2	ND	4.7	ND	-----	-----	ND	4.2	ND	4	ND	4	ND	3	ND
127	-----	7.3	7	ND	1.3	ND	-----	-----	ND	6.2	ND	4	ND	4	ND	4	ND
133	-----	6.94	7.6	ND	6.8	ND	-----	-----	ND	7.0	ND	6	ND	6	ND	5	ND
134	-----	7.9	6.7	ND	7.4	ND	-----	-----	ND	7.0	ND	6	ND	6	ND	5	ND
135	-----	8.96	8.8	ND	6.4	ND	-----	-----	ND	7.9	ND	6	ND	6	ND	5	ND
136	-----	10.4	9.9	ND	8.3	ND	-----	-----	ND	8.2	ND	7	ND	7	ND	6	ND
137	-----	10.6	9.8	ND	7.9	ND	-----	-----	ND	-----	-----	7	ND	7	ND	6	ND
153	-----	8.37	ND	ND	8.3	ND	-----	-----	-----	-----	-----	7	ND	-----	-----	-----	-----
154	-----	10.5	10.2	ND	8.2	ND	-----	-----	ND	7.4	ND	8	ND	6	ND	6	ND
157	-----	14.9	3.9	ND	5	ND	-----	-----	ND	3.9	ND	4	ND	3	ND	3	ND
162	-----	11.5	9.8	-----	9.1	ND	-----	-----	ND	8.5	ND	8	8	7	ND	5	ND
163	-----	7.41	7.7	ND	7	ND	-----	-----	ND	5.8	ND	5	ND	5	ND	4	ND
164	-----	6.15	2.7	ND	4.6	ND	-----	-----	-----	4.0	ND	----	-----	-----	-----	2	ND
166	-----	11.5	8.9	ND	7.9	ND	-----	-----	ND	9.5	ND	9	ND	8	ND	7	ND
168	-----	4.64	3.5	ND	3.8	ND	-----	-----	ND	3.22	ND	3	ND	3	ND	2	ND
170	-----	12.4	10.6	ND	9.1	ND	-----	-----	ND	9.1	ND	8	ND	7	ND	6	ND
171	-----	11.1	-----	-----	-----	-----	-----	-----	ND	-----	-----	8	ND	8	ND	5	ND
172	-----	9.52	7.3	ND	9.6	ND	-----	-----	ND	7.9	ND	7	ND	6	ND	6	ND
173	-----	ND	-----	ND	4.5	-----	-----	-----	ND	.67	ND	3	ND	ND	ND	0.4	ND
174	-----	12.1	10	ND	13	ND	-----	-----	ND	9.2	ND	8	ND	6	ND	7	ND
176	-----	12.5	10.2	ND	11	ND	-----	-----	-----	-----	-----	8	ND	7	ND	6	ND
178	-----	3.97	3.9	ND	6.8	ND	-----	-----	ND	2.6	ND	2	ND	2	ND	2	ND
184	-----	13.1	10.4	ND	12	ND	-----	-----	ND	10.7	ND	9	ND	8	ND	7	ND

----- Not sampled .
ND Result not detected.
* Result likely reflects a mix up of pre-treated and post-treated water samples.

TABLE 26
TCE SAMPLING RESULTS FOR HOMES WITH TREATMENT SYSTEMS IN PARTS PER BILLION (ppb)
LITTLE VALLEY SUPERFUND SITE

ID #	1989 - 1996	January 1997	November 1997		Oct. 98 / Feb. 99		May 1999		October 2000	March 2001		October 2002		October 2003		October 2004	
	Range	Pre-Install.	Pre-Treat.	Post-Treat.	Pre-Treat.	Post-Treat.	Pre-Treat.	Post-Treat.	Post-Treat.	Pre-Treat.	Post-Treat.	Pre-Treat.	Post-Treat.	Pre-Treat.	Post-Treat.	Pre-Treat.	Post-Treat.
185	-----	7.85	12.2	ND	13	ND	-----	-----	ND	ND	ND	ND	ND	0.3	ND	6	ND
186	-----	7.08	7.5	ND	9.1	ND	-----	-----	ND	6.0	ND	6	ND	4	ND	4	ND
187	-----	7.45	ND	ND	14	ND	-----	-----	ND	7.7	ND	8	ND	8	ND	8	ND
189	-----	25.1	24.2	ND	29	ND	-----	-----	-----	-----	-----	19	ND	21	ND	19	ND
195	-----	8.05	6.6	ND	8.7	ND	-----	-----	ND	6.1	ND	5	ND	6	ND	4	ND
205	-----	10.7	9.1	ND	12	ND	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
206	-----	-----	-----	-----	5.2	-----	-----	-----	0.405	-----	-----	5	ND	4	ND	3	ND
207	-----	-----	-----	-----	6	-----	5.4	ND	-----	-----	-----	5	ND	5	ND	4	ND
209	5.2 - 10	5.6	-----	-----	4	ND	-----	-----	ND	5.4	ND	----	-----	-----	-----	4	ND

----- Not sampled .
ND Result not detected.
* Result likely reflects a mix up of pre-treated and post-treated water samples.

TABLE 28
SUMMARY OF CHEMICALS OF CONCERN AND MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATIONS

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Process Water (Washdown Scenario)	Trichloroe thylene	0.21	101.5	µg/l	21/33	36	µg/l	97.5% UCL-C

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Process Water (Car Wash Scenario)	Trichloroethylene	0.21	101.5	µg/l	21/33	36	µg/l	97.5% UCL-C

Scenario Time frame: Future
Medium: Soil
Exposure Medium: Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
CCA Surface Soil	Trichloroethylene	0.003	72	mg/kg	10/15	53.4	mg/kg	99% UCL-C

Key
mg/kg: milligrams per kilogram
µg/l: micrograms per liter
99% UCL-C: 99% Chebyshev Upper Confidence Limit

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

The table presents the chemicals of concern (COCs) and exposure point concentration for each of the COCs detected in media at the Little Valley Superfund site (i.e., the concentration that will be used to estimate the exposure and risk from each COC in each medium). Trichloroethylene is the only COC a the site and is found only in the groundwater and in an area of the surface soil at the Cattaraugus Cutlery Area. The table includes the range of concentrations detected for TCE in each medium, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the exposure point concentration (EPC), and how the EPC was derived.

TABLE 29
NON-CANCER TOXICITY DATA SUMMARY

Ingestion

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Adjusted RfD (for Dermal)	Adjusted Dermal RfD Units	Primary Target Organ	Uncertainty/ Modify Factors	Sources of RfD: Target Organ	Dates of RfD:
Trichloroethylene	Chronic	3E-04	mg/kg-day	3E-04	mg/kg-day	Liver	-	NCEA	2001

Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhal. RfC	Inhal. RfC Units	Inhalation RfD	Inhal. RfD Units	Primary Target Organ	Uncertainty/ Modify Factors	Sources of RfD: Target Organ	Dates of RfD:
Trichloroethylene	Chronic	3.5E-02	mg/m^3	1.0E-02	mg/kg-day	Liver, CNS	-	NCEA	2001

Key
NA: No information available
CNS: Central Nervous System Effects
NCEA: National Center for Environmental Assessment, U.S. EPA

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to Trichloroethylene, the contaminant of concern in both groundwater and surface soil in the Cattaraugus Cutlery Area.

TABLE 30
CANCER TOXICITY DATA SUMMARY

Ingestion, Dermal Contact

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Trichloroethylene	4E-01	$(mg/kg\text{-}day)^{-1}$	4E-01	$(mg/kg\text{-}day)^{-1}$	B2-C	NCEA	2001

Inhalation

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Trichloroethylene	1.1E-01	$(mg/cu.\ m)^{-1}$	4.0E-01	$(mg/kg\text{-}day)^{-1}$	B2-C	NCEA	2001

Key

NCEA : National Center for Environmental Assessment
A - Human carcinogen
B1 - Probable Human Carcinogen - Indicates that limited human data are available
B2 - Probable Human Carcinogen - Indicates sufficient evidence in animals associated with the site and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to Trichloroethylene, the contaminant of concern in both groundwater and surface soil in the Cattaraugus Cutlery Area.

TABLE 31
RISK CHARACTERIZATION SUMMARY - CARCINOGENS

Scenario Timeframe: Future
Receptor Population: Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Ground-water	Process Water (Washdown Scenario)	Trichloroethylene	1.3E-06	2.5E-04	-	2.6E-004
						Total Risk =	2.6E–004

Scenario Timeframe: Future
Receptor Population: Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Process Water (Car Wash Scenario)	Trichloroethylene	1.0E-05	2.4E-03	-	2.5E-03
						Total Risk =	2.6E-03

Scenario Timeframe: Future
Receptor Population: Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	CCA Surface Soil	Trichloroethylene	3.7E-06	6.1E-04	-	6.1E-04
						Total Risk =	7.6E-04

Summary of Risk Characterization for Carcinogens

The cancer risk estimates presented represent both the cancer risk associated with exposure to the contaminant of concern, Trichlorotheylene, as well as the total cancer risk from exposure to all site-related contaminants detected. As shown in the table, the most significant contribution to the total cancer risk is from TCE; no other contaminant contributed significantly to the total cancer risk.

TABLE 32
ALTERNATIVE S-4: EXCAVATION/OFF-SITE DISPOSAL
CAPITAL COST ESTIMATE

FACILITY/CONSTRUCTION	ESTIMATED QUANTITY	UNIT OF MEASURE	MATERIAL UNIT PRICE	MATERIAL COST	INSTALLATION UNIT PRICE	INSTALLATION COST	DIRECT CONSTRUCTION COST
I. Support Facility							
1. Office Trailer	1	Lump Sum		$0	$7,500	$7,500	**$7,500**
2. Decontamination Trailer	1	Lump Sum		$0	$13,500	$13,500	**$13,500**
II. Excavation							
3. Concrete Slab Removal	15	Cubic Yard		$0	$81	$1,215	$1,215
4. Excavation	222	Cubic Yard		$0	$150	$33,333	$33,333
III. Post-Excavation Sampling	10	Each		$0	$600	$6,000	$6,000
IV. Off-Site Treatment and Disposal							
1. Debris	15	Cubic Yard		$0	$130	$1,950	$1,950
2. Non-hazardous Soil	222	Cubic Yard		$0	$130	$28,889	$28,889
V. Restoration							
1. Subgrade Preparation	1200	Square Feet		$0	$0.48	$576	$576
2. Backfill	200	Cubic Yard		$0	$5.48	$1,096	$1,096
3. Topsoil, Seed, Mulch, Fertilizer	1200	Square Feet		$0	$5.46	$6,552	$6,552
						Total Direct Construction Cost (TDCC)	$100,611
						Contingency @20% of TDCC	$20,122
						Engineering @ 10% of TDCC	$10,061
						Legal and Administrative @ 5% of TDCC	$5,031
						Total Capital Cost	$135,825

TABLE 33
ALTERNATIVE GW-2: MONITORED NATURAL ATTENUATION/INSTITUTIONAL CONTROLS
ANNUAL OPERATION AND MAINTENANCE COST ESTIMATE[1]

OPERATION AND MAINTENANCE	BASIS OF ESTIMATE	YEAR	ANNUAL O&M COST
I. Monitoring			
1. Water Sampling	Labor @ $60/hr - 120 hrs/yr	1-10	$7,200
2. Laboratory Analysis	24 samples @ $600 each	1-10	$14,400
3. Reporting	Labor @ $80/hr - 80 hrs/yr	1-10	$6,400
II. Maintenance	Monitoring Well Replacement (assume 1 per year)	1-10	$4,300
III. Contingency	5% of annual O&M costs	1-10	$1,615
		Annual O&M	$33,915
		NPV (@7%) of O&M	$238,205

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1 The capital cost for this alternative is $0 (existing groundwater monitoring wells will be utilized).

LITTLE VALLEY SUPERFUND SITE
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APPENDIX III

ADMINISTRATIVE RECORD INDEX

LITTLE VALLEY SITE
OPERABLE UNIT TWO
ADMINISTRATIVE RECORD
INDEX OF CONTENTS

1.0 SITE IDENTIFICATION

1.5 Previous Operable Unit Information

Explanation of Significant Differences, Little Valley Superfund Site, Little Valley, Cattaraugus County, New York, prepared by U.S. EPA, Region 2, April 2002. (Note: This document is located in the Little Valley Site, Operable Unit One, Administrative Record Update #2).

P. 100001 - 100013 Report: Five-Year Review Report, Little Valley Superfund Site, Little Valley, Cattaraugus County, New York, prepared by U. S. EPA, Region 2, May 2002.

4.0 REMEDIAL INVESTIGATION/FEASIBILITY STUDY

4.2 Remedial Investigation/Feasibility Study Work Plans

P. 400001 - 400120 Plan: Final Work Plan for a Remedial Investigation and Feasibility Study Source Investigation and Control, Little Valley Superfund Site, Cattaraugus County, N.Y., prepared by Ming Kuo, Ph.D., P.E., Site Manager, Foster Wheeler Environmental Corporation, prepared for U.S. EPA, Region II, April 1997.

P. 400770 - 400801 Letter to Ms. Patricia Simmons, Project Manager, Central New York Remediation Section, U.S. EPA, Region 2, from Mr. Gregory P. Sutton, P.E., Project Engineer, Region 9, N.Y.S. DEC, re: Subsurface Investigation Work Plan, Bush Industries/Little Valley Site, Little Valley (V), Cattaraugus County, April 7, 1999. (Attachments: Order on Consent, State of New York: Department of Environmental Conservation, In the Matter of Alleged Violation of the Environmental Conservation Law (ECL), Article 17, and Title 6 of the Codes, Rules and Regulations of the State of New York (6 NYCRR), Part 703.5, BUSH INDUSTRIES, INC., Jamestown, New York, (Chautauqua County), RESPONDENT, File No. 96-07, R9-4314-96-06, March 30, 1999; and <u>Subsurface Investigation Work Plan, Bush Industries Inc., Little Valley, New York</u>, prepared by Conestoga-Rovers & Associates, prepared for Bush Industries, Inc., January 1999.)

p. 400938 - 401141 Report: <u>Addenda to Final Field Operations Plan for Remedial Investigation and Feasibility Study Source Investigation and Control, Little Valley Superfund Site, Cattaraugus County, New York, Revision 1</u>, prepared by Foster Wheeler Environmental Corporation, prepared for U.S. EPA, Region II, July 2003.

4.3 Remedial Investigation/Feasibility Study Reports

p. 400374 - 400769 Report: <u>Final Phase I - Site Screening Report for Remedial Investigation and Feasibility Study Source Investigation and Control</u>, Little Valley Superfund Site, Cattaraugus County, N.Y., prepared by Mr. Tom Fowler, CPG, PG, Field Operations Leader, Foster Wheeler Environmental Corporation, prepared for U.S. EPA, Region II, May 1998.

p. 400802 - 400872 Report: <u>Draft Results of a State 1A Cultural Resources Survey, Bush Industries and Cattaraugus Cutlery Study Areas, Little Valley Superfund Site, Cattaraugus County, New York</u>, prepared by Foster Wheeler Environmental Corporation, prepared for U.S. EPA, Region II, June 2001.

P. 400873 - 400937 Report: <u>Little Valley Superfund Site, (Cattaraugus Cutlery and Bush Industries Areas), Wetland Letter Report</u>, prepared by Foster Wheeler Environmental Corporation, prepared for U.S. EPA, Region II, June 2001.

p. 401142 - 402001 Report: <u>Remedial Investigation Report for OU-2 Remedial Investigation and Feasibility Study, Little Valley Superfund Site, Cattaraugus County, New York, Volume I of II</u>, prepared by Tetra Tech FW, Inc., prepared for U.S. EPA, Region 2, January 2005.

p. 402002- 403354 Report: <u>Remedial Investigation Report for OU-2 Remedial Investigation and Feasibility Study, Little Valley Superfund Site, Cattaraugus County,</u>

New York, Volume II of II, prepared by Tetra Tech FW, Inc., prepared for U.S. EPA, Region 2, January 2005.

p. 403355- 403614 Report: Feasibility Study Report for OU-2 Remedial Investigation and Feasibility Study, Little Valley Superfund Site, Cattaraugus County, New York, prepared by Tetra Tech FW, Inc., prepared for U.S. EPA, Region 2, April 2005.

p. 403615 - 403619 Report: Feasibility Study Report for OU-2 Remedial Investigation and Feasibility Study, Little Valley Superfund Site, Cattaraugus County, New York, Addendum No. 1, undated.

4.4 Proposed Plans (SOP,FOP)

P. 400121 - 400373 Report: Final Field Operations Plan for Remedial Investigation and Feasibility Study Source Investigation and Control, Little Valley Superfund Site, Cattaraugus County, N.Y., Prepared by Ming Kuo, Ph.D., P.E., Site Manager, Foster Wheeler Environmental Corporation, prepared for U.S. EPA, Region II, September 1997.

4.6 Correspondence

p. 403620 - 403620 Letter to Ms. Patricia Pierre, NYS Handler, Little Valley Superfund Site, from Ms. Tammy Buchhardt, Clerk Treasurer, Village of Little Valley, re: Confirmation regarding zoning of Old Cutlery site and Bush Industries site, April 23, 2004.

10.0 PUBLIC PARTICIPATION

10.9 Proposed Plan

P. 10.00001- 10.00016A Superfund Proposed Plan, Little Valley Superfund Site, Cattaraugus County, New York, prepared by U.S. EPA, Region 2, June 2005.

P. 10.00017- 10.00018 Letter to Mr. William J. McCabe, Acting Director, Emergency and Remedial Response Division, U.S. EPA, Region 2, from Mr. Dale A. Desnoyers, Director, Division of Environmental Remediation, New York State Department of Environmental Conservation, re: Proposed Plan Dated June 2005, Little Valley Site No. 905026, Little Valley, Cattaraugus County, June 17, 2005.

LITTLE VALLEY SUPERFUND SITE
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APPENDIX IV

STATE LETTER OF CONCURRENCE

New York State Department of Environmental Conservation
Division of Environmental Remediation, 12th Floor
625 Broadway, Albany, New York 12233-7011
Phone: (518) 402-9706 • **FAX:** (518) 402-9020
Website: www.dec.state.ny.us

Denise M. Sheehan
Acting
Commissioner

AUG 19 2005

Mr. William J. McCabe
Acting Director
Emergency and Remedial Response Division
United States Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007-1866

Re: Record of Decision
Little Valley Site No. 905026
Little Valley, Cattaraugus County

Dear Mr. McCabe:

The New York State Department of Environmental Conservation (Department) has reviewed the August 2005 Record of Decision for the Little Valley site. The Remedial Investigation has shown that the former Cattaraugus Cutlery area is a localized source of groundwater contamination. The soil remedy (Alternative S-4) includes the excavation and off-site disposal of approximately 200 cubic yards of TCE contaminated soil from the former Cattaraugus Cutlery area. The groundwater remedy (Alternative GW-2) will be to monitor the groundwater downgradient and underlying the Bush Industries, Cattaraugus Cutlery, Great Triangle and Ninth Street Landfill areas as well as the site-wide plume. In addition, an evaluation of soil vapor intrusion within the study area will be performed and corrective action would be taken, if necessary.

Also, property owners and local government agencies will receive written notification about the potential for groundwater impact and that the impacted groundwater should not be used for drinking without appropriate treatment. Periodically, staff from the Department, the New York State Department of Health and/or the Cattaraugus County Health Department will meet with or notify local government agencies about the potential for impacted groundwater on unimproved parcels. If the groundwater below the unimproved parcels is impacted with TCE above the maximum contaminant level, the groundwater should not be used without treatment.

The Department concurs with the remedy described in the Record of Decision. If you have any questions or concerns, please contact Martin Doster at (716) 851-7220.

Sincerely,

for Dale A. Desnoyers
Director
Division of Environmental Remediation

cc: Mr. Edward Belmore, NYSDEC
Mr. Cameron O'Connor, NYSDOH
Mr. Eric Wohlers, CCHD
Mr. Mark VanValkenburg, NYSDOH
Mr. Martin Doster, NYSDEC
Ms. Linda Ross, NYSDEC

LITTLE VALLEY SUPERFUND SITE
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APPENDIX V

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY
FOR THE
LITTLE VALLEY SUPERFUND SITE
LITTLE VALLEY, CATTARAUGUS COUNTY, NEW YORK

INTRODUCTION

This Responsiveness Summary provides a summary of citizens' comments and concerns received during the public comment period related to the Little Valley Superfund site (Site) remedial investigation and feasibility study (RI/FS) and the Proposed Plan, and provides the responses of the U.S. Environmental Protection Agency (EPA) to those comments and concerns. All comments summarized in this document have been considered in EPA's final decision in the selection of a remedy to address the contamination at the Site.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

The RI/FS report describes the nature and extent of the contamination in the soils and groundwater at the Site and evaluates remedial alternatives to address this contamination. The Proposed Plan identifies EPA and the New York State Department of Environmental Conservation's (NYSDEC's) preferred remedy and the basis for that preference. These documents were made available to the public in the Administrative Record, copies of which are located at the EPA Region 2 offices at 290 Broadway in Manhattan; at the Town of Little Valley Municipal Building, located at 103 Rock City Street, Little Valley, New York; and at the Salamanca Public Library, located at 155 Wildwood Avenue, Salamanca, New York.

A notice of the commencement of the public comment period, the public meeting date, the preferred remedy, contact information, and the availability of above-referenced documents was published in the *Times Herald* and the *Twin Tiers Trader* on June 27, 2005. The public comment period ran from June 27, 2005 to July 26, 2005. EPA held a public meeting on July 6, 2005 at 7:00 P.M. at the Little Valley Elementary Campus, 207 Rock City Street, Little Valley, New York, to present the findings of the RI/FS, to identify the preferred remedy and the basis for that preference, and to answer questions from the public about the Site and the remedial alternatives under consideration. Approximately 25 people, including residents, local business people, and state and local government officials, attended the public meeting. On the basis of comments received during the public comment period, the public generally supports the selected remedy. Public comments were related to groundwater monitoring, the agencies' Site-related efforts and responsibilities, the point-of-use treatment systems, exposure and health effects, the scope of the remediation, waterline installation, sources of contamination, and definitions.

Responses to the comments received at the public meeting are summarized below (one e-mailed comment was received, but a response was not necessary).

EPA's 1984 Indian Policy recognizes the government-to-government relationship between EPA and the Nations, as one sovereign to another. EPA has committed to communicating with Nation governments before making decisions on environmental matters affecting Nation governments and/or Nation natural resources. To this end, in May 2005, EPA discussed the preferred remedy and the basis for this preference with Seneca Nation Environmental Protection Department representatives. No concerns related to the preferred remedy were expressed by the Nation's representatives at that time.

OVERVIEW

The public generally supports the preferred remedy, which includes:

- Excavation of approximately 200 cubic yards of trichloroethylene (TCE)-contaminated soil exceeding the New York State Technical and Administrative Guidance Memorandum No. 94-HWR-4046 (TAGM) objective[1] of 700 micrograms per kilogram (µg/kg) to an estimated depth of four feet at two locations in the Cattaraugus Cutlery Area;
- Post-excavation confirmatory soil sampling;
- Backfilling of excavated areas with clean fill;
- Characterization and transportation of excavated material for treatment and/or disposal at an off-Site facility in compliance with the Resource Conservation and Recovery Act;
- Natural attenuation of the contaminated groundwater underlying the Bush Industries, Cattaraugus Cutlery, Great Triangle, and Ninth Street Landfill Areas, as well as the Site-wide plume; and
- Periodic groundwater sample collection and analyses to verify that the contaminants are declining in concentration and in extent as a result of natural attenuation.

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1 *Division Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels*, Division of Hazardous Waste Remediation, New York State Department of Environmental Conservation, January 24, 1994.

This alternative also includes institutional controls. Specifically, after an initial notification, NYSDEC, New York State Department of Health, and/or Cattaraugus County Health Department will periodically meet with or notify local governmental agencies to remind them that if any unimproved parcel where the underlying groundwater is contaminated with TCE above the Maximum Contaminant Level is developed, the groundwater should not be used without treatment. EPA will also notify the Bush Industries and Cattaraugus Cutlery Area property owners that the underlying groundwater is contaminated and should not be used without treatment. As part of EPA's natural attenuation monitoring at the Bush Industries and Cattaraugus Cutlery Areas, the properties will be inspected annually to verify that wells without treatment systems have not been installed. An annual report summarizing the results of the groundwater monitoring and the findings of such inspections will be prepared.

An evaluation of the potential for soil vapor intrusion into structures within the study area will be conducted; mitigation may be performed, if necessary.

In addition, until groundwater standards are met, public health will continue to be protected with the point-of-use treatment units that were installed pursuant to the 1996 interim remedy decision for drinking water at the Site. NYSDEC will continue to monitor the private wells and maintain the individual point-of-use treatment units until groundwater standards are met at the individual wells.

SUMMARY OF COMMENTS AND RESPONSES

A summary of the comments provided at the public meeting and in writing (one e-mail), as well as EPA's responses to them, are provided below. The comments and responses have been organized into the following topics:

- groundwater monitoring
- agencies' Site-related efforts and responsibilities
- point-of-use treatment systems
- exposure and health effects
- scope of the remediation
- waterline installation
- sources of contamination
- definitions.

Groundwater Monitoring

Comment #1: A commenter who resides across the street from the Luminite Products Corporation (Luminite) Area asked why two monitoring wells that were installed on his property have not been sampled in several years.

Response #1: The two monitoring wells on the subject property were installed as part of EPA's investigation to identify the sources of groundwater contamination. While the concentration of TCE at the Luminite Area exceeded the groundwater standard in 1998 when the monitoring wells were installed, the 2003 sample results for this area showed TCE levels to be below the groundwater standard. Therefore, further sampling in this area was suspended. It has not yet been determined what monitoring wells will be sampled as part of the natural attenuation monitoring. It is possible that one or both of these monitoring wells could be used.

Comment #2: A number of residents indicated that while their wells have been sampled annually, they had not received the sample results for the past several years.

Response #2: Through an oversight, NYSDEC, which assumed responsibility for the annual monitoring and maintenance related to the point-of-use treatment systems in 2002, did not send out the data to the residents. NYSDEC sent the 2002, 2003, and 2004 sampling data to the residents on July 19, 2005.

Comment #3: A commenter suggested that the private wells be monitored more frequently than annually because of concerns related to seasonal fluctuations in the groundwater.

Response #3: The private wells are sampled in the fall each year. Based upon these annual sampling events, we are seeing a general decrease in contaminant concentrations. Therefore, EPA believes that more frequent monitoring is not warranted.

Agencies' Site-Related Efforts and Responsibilities

Comment #4: A commenter asked why the work at the Site has been transferred from the County, to the State, to EPA. Another commenter asked what entities funded the Site-related investigations and who will fund the planned remedial action.

Response #4: Prior to the listing of the Site on the Superfund National Priorities List (NPL) in 1996, the investigative work was performed by Cattaraugus County Health Department (CCHD), NYSDEC, and the New York State Department of Health (NYSDOH) at their own expense. The costs related to the installation of the point-of-use treatment systems in 1997 and their maintenance and private well sampling until 2002 were shared by EPA and NYSDEC (EPA provided 90% of the funding; NYSDEC provided the remaining 10%) for five years. NYSDEC has been maintaining the point-of-use treatment systems and sampling the private wells since 2002. The source identification remedial investigation and feasibility study was performed by EPA. EPA will attempt to have Bush Industries undertake the natural attenuation monitoring portion of the selected remedy. It is anticipated that EPA and NYSDEC will cost share the remaining portions of the remedy.

Point-of-Use Treatment Systems

Comment #5: A commenter asked why, when contamination was discovered in 1982, did it take fifteen years for point-of-use treatment systems to be installed on private wells.

Response #5: In 1982, CCHD and NYSDEC, while investigating TCE contamination at Luminite, detected TCE in nearby private wells. Over the course of the next several years, additional samples were collected to identify the extent of the contamination in the groundwater. Based upon these sample results, it was concluded that the groundwater plume extended all the way from the Village of Little Valley through the Town of Little Valley to the northern edge of the City of Salamanca. At that time, the New York State drinking water guideline for public water supplies for TCE was 50 micrograms per liter (µg/l). Since none of the private wells exceeded the drinking water standard, the population was deemed not to be at risk. Following the lowering of the drinking water standard for TCE to 5 µg/l in the late 1980s, CCHD issued health advisories to the exposed residents and efforts were made to identify sources of TCE contamination. In 1992, NYSDEC installed a number of monitoring wells in the area and investigated other active and inactive industries and waste disposal areas. No sources were found. In June 1996, EPA listed the Site on the National Priorities List, which contains the highest priority sites in the country. EPA also prepared a focused feasibility study which developed, screened, and evaluated alternatives for an alternate water supply system for the affected and potentially affected residences to address the most immediate concerns at the Site. Based upon the results of the focused feasibility study, in September 1996, EPA issued a Record of Decision (ROD), providing for the installation of point-of-use treatment systems on all of the affected and potentially affected private wells, as an interim remedy, to ensure that drinking water standards were met. Point-of-use treatment systems were installed in 1997.

Comment #6: A commenter asked why the air strippers that were originally installed on the affected wells were eventually replaced with carbon systems.

Response #6: Air strippers were initially employed because, based upon the maximum TCE concentrations that were present in the private wells at that time, they would be significantly less costly to maintain than granular activated carbon treatment units. Installation of the air stripper treatment units was completed in October 1997. Subsequently, granular activated carbon units were installed in addition to the air strippers as polishing units to ensure the consistent removal of contaminants.

In 2002, EPA determined that the air strippers were reaching the end of their useful life and because of the significant reduction in contaminant concentrations, the granular activated carbon units alone would be able to effectively remove the contamination. For these reasons, EPA decided to remove the air stripper treatment units and use only activated carbon treatment units to address the contamination in the private wells. Since NYSDEC and NYSDOH standard operating procedures require two granular activated carbon treatment units in series for individual wells, EPA removed the air stripper treatment units and placed an additional carbon unit on each affected well.

Comment #7: A commenter asked about the effectiveness of the point-of-use treatment systems in eliminating contamination from the drinking water.

Response #7: The point-of-use treatment systems have two granular activated carbon treatment units in series. Activated carbon is very effective in attracting and retaining volatile organic compounds from water. The two granular activated carbon treatment units in series allow the carbon to be replaced once sampling shows that the carbon in the primary tank (the first tank) is no longer effectively removing the contaminants (the secondary tank would remove any contaminants that pass through the primary tank, thereby continuing to protect the water supply). No TCE has been detected in water samples collected after the secondary tanks.

Exposure and Health Effects

Comment #8: Several residents expressed concern about exposure to vapors from the point-of-use air stripping treatment units that have since been replaced with carbon units.

Response #8: Releases of volatile organic compounds from air strippers must meet stringent air regulations. The levels of TCE that were present in the groundwater when the air strippers were in place were such that after going through the air strippers, the air discharges were able to comply with the stringent discharge requirements without treatment. Since the discharges quickly dissipate into the atmosphere once they are released, the risk of exposure was minimal.

Comment #9: A commenter asked that the health effects from exposure to TCE-contaminated groundwater be identified.

Response #9: Prolonged TCE exposure through both the inhalation and oral routes (*i.e.*, breathing and ingestion) is associated with several adverse health effects, including neurotoxicity, immunotoxicity, developmental toxicity, liver toxicity, kidney toxicity, endocrine effects, and several forms of cancer. More specific information related to the health effects of TCE can be obtained from NYSDOH's Center for Environmental Health at (800) 458-1158, extension 27860, NYSDOH's web site at www.health.state.ny.us/nysdoh/gas/svi_guidance/index.htm, or the Agency for Toxic Substances and Disease Registry's ToxFAQs Hazardous Substance Fact Sheet website at www.atsdr.cdc.gov/toxfaq.htm.

Comment #10: A commenter asked whether mechanisms are in place to track adverse impacts from exposure to Site-related contaminants.

Response #10: NYSDOH established the New York State VOC Exposure Registry in 1999 to collect health surveillance information on populations exposed to various types of VOCs, including TCE, to maintain contact with exposed populations, obtain periodic health updates, act as a resource for future studies, and communicate new information to participants.

Individuals and communities are considered for inclusion in the VOC Exposure Registry if exposures from the contamination of private wells, public water supplies, or indoor air have been verified by sampling results. Residents who wish to participate complete a questionnaire that asks about possible exposures, past and current health status of each household member, and other factors related to health such as smoking. The types of health problems reported can be compared with national data to see if the community is experiencing unusually high rates or unusual patterns of disease. Information gathered from communities with similar types of potential exposures can be combined, thus, improving the quality of research that can result. Information regarding the Registry's current status, participant exposures, and demographics will be provided to participants when they are re-contacted to update address and health information approximately every two to three years.

For more information about the VOC Exposure Registry, Megan Meldrum should be contacted at (800) 458-1158, extension 27950.

NYSDOH's Cancer Registry collects, processes, and reports on information about every New Yorker diagnosed with cancer. The Cancer Registry is used by NYSDOH to undertake cancer incidence studies to determine whether or not there is a significant increase in a particular type of cancer in a community.

For more information about cancer incidence studies, NYSDOH's website, http://www.health.state.ny.us/nysdoh/cancer/nyscr/nyscr.htm, should be consulted.

Scope of the Remediation

Comment #11: A commenter indicated that while he agreed with the aggressive approach being applied to the soil remedy (*i.e.*, excavation of the source areas), he was concerned about the "passive" monitored natural attenuation remedy for the groundwater. He indicated that he believed that an active groundwater remedy should be employed to prevent exposure, stating that cost alone should not be the basis for selecting the groundwater remedy.

Response #11: While cost is important in selecting a remedy for a site, it is only one of the criteria that are considered. EPA conducts a comparative analysis of the viable remedial alternatives against a number of other evaluation criteria. Based upon a detailed analysis of the groundwater alternatives, EPA determined that monitored natural attenuation of the source areas and Site-wide groundwater plume with institutional controls provides the best balance of tradeoffs among the alternatives considered with respect to the evaluation criteria. Specifically, while the selected groundwater remedy will not actively treat the groundwater and will require an estimated 10 years to achieve groundwater standards, there is currently no threat of exposure to contaminated groundwater at the Site, since point-of-use treatment systems have been installed on all of the affected drinking water wells. In addition, a review of the historical groundwater sampling data from the Bush Industries Area shows that natural attenuation of the groundwater is occurring. Although sample results from groundwater monitoring wells in the Cattaraugus Cutlery Area do not show a downward trend in the contaminant levels over time, it is expected that in combination with removing the sources of TCE from the soil in this area under the selected soil remedy, TCE concentrations in the groundwater will begin to diminish. Active remedial measures were not considered for the Site-wide groundwater plume because there is already an overall downward trend of TCE contamination in the plume. With regard to cost, while the groundwater extraction and treatment alternative[2] is approximately $5.7 million more expensive than the selected monitored natural attenuation remedy, it would achieve groundwater standards in the two source areas (Bush Industries and Cattaraugus Cutlery Areas) in an estimated 8 years (as compared to 10 years for monitored natural attenuation). The *in-situ* air sparging alternative[3] is approximately $1.3

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2 Under this alternative, extraction of the contaminated groundwater would be accomplished using wells and the extracted groundwater would be treated by air stripping. Air stripping involves pumping untreated groundwater to the top of a "packed" column, which contains a specified amount of inert packing material. The column receives ambient air under pressure in an upward direction from the bottom of the column as the water flows downward, transferring VOCs to the air phase.

3 *In-situ* air sparging involves injecting air, under pressure, into the aquifer via injection wells. Under this process, bubbles are formed from the injected air, which strip the VOCs from the groundwater. A vapor extraction system is used to remove and treat the vapors that are generated.

million more expensive than monitored natural attenuation, and it would achieve groundwater standards in the two source areas in an estimated 2 years.

Comment #12: A commenter asked why no active remediation needs to be undertaken at the Bush Industries Area. Another commenter asked what the effect of removing the two source areas on the Cattaraugus Cutlery Area will have on the groundwater. The commenter also asked whether or not the residents will ever be able to stop using their treatment systems.

Response #12: The results of the soil sampling at the Bush Industries Area indicate that while TCE was detected, the concentrations do not exceed New York State's cleanup objectives. The results of groundwater sampling at the Bush Industries Area indicate the presence of elevated levels of TCE and its breakdown products (such as 1,2-dichloroethene). The concentration of TCE decreases as the groundwater traverses the property; however, the concentration exceeds the groundwater standard for TCE at the property boundary. A review of the historical groundwater sample results from the Bush Industries Area shows that natural attenuation is occurring. Therefore, allowing natural attenuation of the groundwater to continue was deemed to be appropriate.

Although sample results from groundwater monitoring wells in the Cattaraugus Cutlery Area do not show a downward trend over time, it is expected that in combination with removing the sources of TCE from the soil in this area, TCE concentrations in the groundwater will begin to diminish.

Under the selected remedy, TCE levels are expected to attenuate to groundwater standards Site-wide in approximately ten years. Therefore, it is anticipated that the point-of-use treatment systems could all be discontinued in ten years.

Comment #13: A commenter expressed concern that perhaps just as the drinking water standard for TCE was lowered from 50 µg/l to 5 µg/l, it may be determined in the future that the 5 µg/l standard is unprotective. Since the point-of-use treatment systems will be removed once the drinking water standard is achieved, residents may be exposed to unacceptable levels of TCE should the drinking water standard change in the future. Therefore, the treatment units should remain in place until TCE is no longer present. Another commenter asked how long would it take for the TCE levels to reach zero.

Response #13: The drinking water standard of 5 µg/l for TCE is the highest level allowed in drinking water. This value was promulgated as an enforceable standard based on information on the likelihood of developing health effects from TCE in drinking water over long-term exposure. As more information on the toxicity of TCE is known, the health effects associated with exposure to TCE will be reevaluated. If the drinking water standard for TCE is lowered in the future, EPA will need to reevaluate the protectiveness of the remedy.

While NYSDEC will no longer maintain a point-of-use treatment system once the drinking water standard is obtained and confirmed by follow-up sampling, if a resident so desires, they can keep their point-of-use treatment system if they assume responsibility for maintaining it. Once the levels of TCE are below 5 µg/l, the carbon would not require replacement as frequently.

EPA's analysis of the groundwater data indicates that the selected remedy would meet state and federal groundwater standards through natural attenuation in an estimated 10 years. Current technology will not allow measurement of TCE to zero. The detection limit for TCE using the analytical equipment available in laboratories is 0.5 µg/l. Based upon EPA's analysis of the groundwater data, to reach the detection limit for TCE would take an estimated additional 15 years.

Comment #14: A commenter asked whether the extent of the contaminated soil excavation will be based upon post-excavation soil sample results, and if so, what is the soil cleanup level?

Response #14: The selected soil remedy alternative involves the excavation of TCE-contaminated soil exceeding the New York State TAGM objective of 700 µg/kg. Based upon this clean up level, it is estimated that 200 cubic yards of soil will be removed to an estimated depth of four feet at two locations in the Cattaraugus Cutlery Area. The actual extent of the excavation and the volume of the excavated soil will be based on pre- and post-excavation confirmatory sampling.

Waterline Installation

Comment #15: Several commenters suggested that a waterline be installed.

Response #15: As is documented in the ROD and summarized here, EPA has determined that a waterline is not necessary for the following reasons. Of the 91 private wells that have point-of-use treatment systems installed, 90 were sampled in October 2004. The results show that 49 of the wells are at or below the drinking water standard of 5 µg/L for TCE. Of the 41 wells that have contaminant levels exceeding the drinking water standard, the majority of these wells only marginally exceed 5 µg/L (32 wells have TCE levels between 6 µg/L and 10 µg/L). In addition, sampling results since 1989 indicate that there are decreasing levels of contaminants in all but a few wells; the highest concentration for the October 2004 sampling event was 22 µg/L, as compared to a historical high of 50 µg/L, and the average concentration is now 5.9 µg/L. Also, there is no current unacceptable direct contact risk associated with exposure to the groundwater, since point-of-use treatment systems have been installed on all of the affected drinking water wells and are operating effectively.

The point-of-use treatment systems will continue to be operated until drinking water standards are reached. For ten years of operation under the selected groundwater remedy, the overall present-worth cost is $710,000, as compared to an estimated present-worth cost of $3.5 - $3.7 million for a waterline.

Based on these findings, EPA believes that public health should continue to be protected with the point-of-use treatment units that were installed pursuant to the 1996 interim remedy decision for drinking water at the Site until drinking water standards are met in the groundwater (in approximately ten years).

Sources of Contamination

Comment #16: A commenter asked whether or not the Bush Industries and Cattaraugus Cutlery Areas are the only sources of groundwater contamination.

Response #16: Based upon the TCE concentrations that were detected in the soil and the TCE concentrations which exceed the groundwater standard, the Bush Industries Area appears to be a current localized source of groundwater contamination. Based upon the soil data, the Cattaraugus Cutlery Area has also been determined to be a current localized source of groundwater contamination at the Site.

The Great Triangle and Ninth Street Landfill Areas have TCE concentrations in the groundwater that exceed the groundwater standard, however, only low levels of TCE were detected in the soils in these areas. Until recently, the groundwater underlying the Luminite Area exceeded the groundwater standard for TCE. At present, the groundwater in this area is below the groundwater standard. While it is likely that the Great Triangle, Luminite, and Ninth Street Landfill Areas may have been sources of groundwater contamination in the past, based upon the current data, they are not acting as current sources.

Definitions

Comment #17: A commenter asked that the Little Valley site be defined.

Response #17: Under the federal Superfund law, a site includes the source of the contamination, the extent of its migration, and areas in close proximity necessary to address the contamination. The TCE groundwater plume comprises the boundaries of the

Little Valley site. The plume extends approximately eight miles southeastward from the Village of Little Valley through the Town of Little Valley to the northern edge of the City of Salamanca. The Site also includes five areas that were identified as either current or likely past sources of TCE contamination in the groundwater—Bush Industries Area; Cattaraugus Cutlery Area; Great Triangle Area (Drum Storage Area); Luminite Area; and Ninth Street Landfill Area.

Comment #18: A commenter asked that present-worth cost be defined.

Response #18: Present-worth cost is the total cost of an alternative over time in terms of today's dollar value. It is determined by calculating the current value of the annual operation, maintenance, and monitoring costs over the life of the project, applying a discount rate (in this case 7%) and adding that value to the cost to construct the remedy.

Comment #19: A commenter asked that natural attenuation be explained.

Response #19: Natural attenuation includes a variety of *in-situ* (in-place) processes which, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. For this Site, these *in-situ* processes include dispersion, dilution, and adsorption; limited degradation may be occurring in select areas of the Site, particularly in the suspected source areas.

RESPONSIVENESS SUMMARY

APPENDIX V-a

JULY 2005 PROPOSED PLAN

Little Valley Superfund Site

Cattaraugus County, New York

EPA
Region 2

June 2005

PURPOSE OF PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered for the contaminated soil and groundwater at the Little Valley Superfund site (Site), and identifies the preferred remedy with the rationale for this preference. This Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA) in consultation with the New York State Department of Environmental Conservation (NYSDEC). EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Sections 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The nature and extent of the contamination at the Site and the alternatives summarized in this Proposed Plan are described in the January 2005 remedial investigation (RI) report and April 2005 feasibility study (FS) report, respectively. EPA and NYSDEC encourage the public to review these documents to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted at the Site.

This Proposed Plan is being provided as a supplement to the FS report to inform the public of EPA's and NYSDEC's preferred remedy and to solicit public comments pertaining to the remedial alternatives evaluated, including the preferred soil and groundwater alternatives. EPA's preferred remedy consists of excavation and off-Site disposal of contaminated soils at one source area, and monitored natural attenuation and institutional controls to address the contaminated groundwater. An evaluation of the potential for soil vapor intrusion into structures within the study area will be conducted; mitigation may be performed, if necessary.

A review of the residential well sampling results since 1989 indicate that there are decreasing levels of contaminants in all but a few drinking water wells and there is no current unacceptable risk associated with exposure to the contaminated groundwater, because point-of-use treatment systems have been installed on all of the affected drinking water wells pursuant to the September 1996 remedy decision for this Site. In addition, contaminants in these wells will reach drinking water standards in an estimated ten years. Therefore, EPA also proposes to continue to protect public health with the point-of-use treatment units that were installed.

The remedy described in this Proposed Plan is the preferred remedy for the Site. Changes to the preferred remedy, or a change from the preferred remedy to another remedy, may be made if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after EPA has taken into consideration all public comments. EPA is soliciting public comment on all of the alternatives considered in this Proposed Plan and in the detailed analysis section of the FS report because EPA and NYSDEC may select a remedy other than the preferred remedy.

MARK YOUR CALENDAR

June 27, 2005 - July 26, 2005: Public comment period on the Proposed Plan.

July 6, 2005 at 7:00 P.M.: Public meeting at the Little Valley Elementary Campus, 207 Rock City Street, Little Valley, NY.

COMMUNITY ROLE IN SELECTION PROCESS

EPA and NYSDEC rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI and FS reports and this Proposed Plan have been made available to the public for a public comment period which begins on June 27, 2005 and concludes on July 26, 2005.

A public meeting will be held during the public comment period at the Little Valley Elementary Campus on July 6, 2005 at 7:00 p.m. to present the conclusions of the RI/FS, to elaborate further on the reasons for recommending the preferred remedy, and to receive public comments.

Comments received at the public meeting, as well as written comments, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), the document which formalizes the selection of the remedy.

INFORMATION REPOSITORIES

Copies of the Proposed Plan and supporting documentation are available at the following information repositories:

Town of Little Valley Municipal Building
103 Rock City Street
Little Valley, New York 14755

Hours: Monday - Friday, 8:15 A.M. - 4:00 P.M.

Salamanca Public Library
155 Wildwood Avenue
Salamanca, New York 14779

Hours: Monday & Friday, 9:00 AM - 5:30 PM
Tuesday & Thursday, 9:00 AM - 9:00 PM
Wednesday & Saturday, 9:00 AM - 1:00 PM

USEPA-Region II
Superfund Records Center
290 Broadway, 18th Floor
New York, New York 10007-1866
(212) 637-4308

Hours: Monday - Friday, 9:00 A.M. - 5:00 P.M.

Written comments on this Proposed Plan should be addressed to:

Patricia Simmons Pierre
Remedial Project Manager
Central New York Remediation Section
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007-1866

Telefax: (212) 637-3966
Internet: pierre.patricia@epa.gov

SCOPE AND ROLE OF ACTION

In order to remediate Superfund sites, work is often divided into operable units. The objective of the first operable unit was to prevent exposure of area residents to contaminated drinking water. The action described in this Proposed Plan represents the second and final operable unit for the Site. The primary objectives of this action are to remediate an identified source of contamination at the Site, reduce and minimize the downward migration of contaminants to the groundwater, restore groundwater quality, and minimize any potential future health and environmental impacts.

SITE BACKGROUND

Site Description

Since 1982, chemical analyses of groundwater samples collected from monitoring and private wells throughout the Site have indicated the presence of trichloroethylene (TCE), a common industrial cleaning solvent. The TCE plume, which comprises the Site, extends approximately eight miles from the Village of Little Valley to the northern edge of the City of Salamanca, which is part of the Allegheny Indian Reservation. The Site is located in a rural, agricultural area, with a number of small, active and inactive industries and over 200 residential properties situated in the study area along Route 353, the main transportation route between Little Valley and Salamanca. Private water supply wells constitute the only source of drinking water for these properties.

The nearest surface water bodies associated with the Site are Little Valley Creek and its tributaries. Little Valley Creek, a perennial stream with typical stream flow ranging from 20 to 80 cubic feet per second during normal precipitation periods, flows southeast, then south through the Site for approximately eight miles before joining the Allegheny River. The Site ranges in width from 1,000 to 2,500 feet and in elevation from nearly 1,600 feet above mean sea level (msl) in the Village of Little Valley to less than 1,400 feet msl near the Salamanca city line. The Site is bordered by steeply sloping wooded hillsides which attain slopes of up to 25 percent and elevations of 2,200 feet above msl.

Figure 1 shows the Site area.

Site History

In 1982, Cattaraugus County Health Department (CCHD) and NYSDEC, while investigating TCE contamination at the Luminite Products Corporation (Luminite), a small lithographic device manufacturing facility located along Route 353, detected TCE in nearby private wells.

In 1989, NYSDEC sampled the plant production well, process wastewater, and septic tank on the Luminite property, as well as nearby New York State Department of Transportation monitoring wells. The analytical results indicated that groundwater contamination was present both upgradient and downgradient of the Luminite facility, with the plume extending from the Village of Little Valley to the northern edge of the City of Salamanca.

Based on these findings, the CCHD issued health advisories to exposed residents and efforts were initiated to determine sources of TCE contamination upgradient of Luminite.

In 1992, NYSDEC installed a number of monitoring wells in the area, and conducted source reconnaissances at the other active and inactive industries and waste disposal areas to investigate possible sources of the contamination. No sources were found.

In June 1996, EPA listed the Site on the National Priorities List, and prepared a focused feasibility study (FFS) to develop, screen, and evaluate alternatives for an alternate water supply system for the affected and potentially affected residences to address the most immediate concerns at the Site.

Based upon the findings of the FFS, on September 30, 1996 EPA issued an interim ROD, providing for the installation of air stripper treatment units on all of the affected and potentially affected private wells to ensure that drinking water standards were met. Air strippers were selected because, based upon the maximum TCE concentrations that were present in the private wells at that time, they would be significantly less costly to maintain than granular activated carbon treatment units.

In September 1996, EPA also commenced an RI/FS to identify sources of the groundwater contamination and to evaluate remedial alternatives.

Installation of the air stripper treatment units was completed in October 1997. Subsequently, granular activated carbon units were installed in addition to the air strippers as polishing units to insure the consistent removal of contaminants.

The ROD also called for an evaluation of the efficacy of the point-of-use treatment systems within five years of their installation, and a determination as to whether or not a more permanent system (such as a water line) would be required. In an April 2002 Explanation of Significant Differences (ESD), EPA determined that it would be more appropriate to evaluate the need for a permanent alternative water supply during the selection of the final groundwater/source area remedy for the Site. EPA also determined that because of the decreasing levels of contaminant concentrations in the private wells, granular activated carbon units alone would effectively remove the contamination. Subsequently, the air stripper treatment units were removed from each well and replaced with a second granular activated carbon unit.

NYSDEC assumed responsibility for the operation and maintenance of the point-of-use treatment units and annual sampling of private wells in October 2002. Routine maintenance is conducted on the treatment units on a quarterly basis, and repairs are performed as needed. As part of the ongoing maintenance of the treatment units, NYSDEC evaluates the effectiveness of the treatment units by sampling the groundwater passing through the individual treatment systems on an annual basis.

Site Geology/Hydrogeology

Little Valley is a U-shaped glacial valley (in cross-section) filled with glacially-derived outwash deposits (*i.e.*, glaciofluvial sediments), which are frequently overlain by more recent alluvial deposits (Cadwell *et al.*, 1988). The recent alluvial deposits are described as glacially-derived, reworked sediments and are representative of the stream bed and floodplain deposits of the Little Valley Creek (Zarriello, 1987). Gravel and sand, with varying amounts of fines, are present from the surface down to the bedrock across the majority of the Bush Industries Area (a source area evaluated in the RI, see the "Results of the Remedial Investigation" section, below). Borings for the Cattaraugus Cutlery Area (another source area evaluated in the RI, see the "Results of the Remedial Investigation" section, below) indicate a relatively thin silt layer over a portion of the property underlain by gravel and sand with varying amounts of fines, which directly overlies till or bedrock.

The depth-to-groundwater in the valley ranges from near the ground surface to approximately 50 feet below ground surface (bgs). In general, the water table is deepest in the upper (northern) portion of the valley and gets progressively closer to the ground surface proceeding down the valley toward the Allegheny River. The overall groundwater flow direction in the gravel and sand aquifer is from north to south, following the slope of the valley topography. In the central portion of the valley, the gravel and sand unit is the thickest and the most permeable. This depresses the water table elevation in the central portion of the valley, compared to the edges of the valley. Along the eastern and western boundaries of the valley, the flow is toward the center of the valley.

RESULTS OF THE REMEDIAL INVESTIGATION

The source identification portion of the RI, conducted from 1997 through 2003, investigated the following potential source areas:

- Ninth Street Landfill Area;
- Bush Industries Area;
- Cattaraugus Cutlery Area;
- King Windows (Second Street) Area;
- First Street Area;
- Great Triangle Area (which includes the Envirotech Drum Storage Area, Western Burnt House Area, Winship Circle/Baker Road Area, and Triangle Southwest Area);
- Whig Street Area;
- Luminite Area;
- State Street Area; and
- Railroad Avenue Area.

The locations of these potential source areas are identified in Figure 1.

Based upon the data collected during the RI, five areas were identified as either current or likely past sources—Bush Industries Area; Cattaraugus Cutlery Area; Great Triangle Area (Drum Storage Area); Luminite Area; and Ninth Street Landfill Area. The history of these areas are described below.

The Bush Industries, Inc.'s facility was used for the manufacture of cutlery by Kinfolks, Inc. from approximately 1926 through 1958. Bush Industries, Inc. currently assembles and manufactures furniture at this location.

The Cattaraugus Cutlery Area consists of several parcels that were used to manufacture cutlery. The W.W. Wilson Cutlery Company, which was formed in the 1890s, operated on the parcels until around 1900, when the company was sold to the Cattaraugus Cutlery Company. The Cattaraugus Cutlery Company manufactured cutlery at this location until the 1950s. Subsequent owners or operators have included Knowles-Fischer (auto parts stamping) and AVM, which owned the property between 1970 and 1977. King Windows, which manufactured stamped metal window parts, is believed to have operated on portions of the property between 1977 and 1993. At present, the property is privately owned, and has been used for storage and a variety of industrial activities since 1993.

The Envirotech Drum Storage Area within the Great Triangle Area is a parcel of vacant land, approximately one acre in size, located along the southeastern right-of-way of Route 242. This parcel was used as a temporary staging area for drums of solvent wastes brought from three other temporary drum storage areas operated by Envirotech. NYSDEC's records indicate that up to 310 drums were stored on this property in 1980 or early 1981, prior to their transport to the Town of Tonawanda for final disposal.

As was noted in the "Site History" section, above, the Luminite Area, which is located along Route 353, is the former site of a small manufacturing facility.

The Ninth Street Landfill was a municipal landfill used by the Village of Little Valley from 1950 to 1972 for the disposal of sanitary and industrial wastes. It was alleged that solvent-containing wastes in containers that originated at the Cattaraugus Cutlery/Knowles-Fisher/AVM/King Windows facilities were disposed in the landfill by Village refuse collection employees. Specific time frames for the alleged disposal activities have not been determined.

The results of the RI are summarized below.

Soils

In an attempt to identify source areas, 59 soil samples were collected from 45 locations. The maximum concentration of TCE in the soil at the Site was detected in the Cattaraugus Cutlery Area (72,000 micrograms per kilogram [μg/kg] at 1.5 to 2 feet bgs). As can be seen from Table 1, only the soil in this area showed TCE concentrations exceeding the New York State Technical and Administrative Guidance Memorandum No. 94-HWR-4046 (TAGM) objective[1].

Table 1: Maximum Soil TCE Concentrations (most recent data)

Area	Maximum TCE Concentration (μg/kg)	Year
Bush Industries	61	2003
Cattaraugus Cutlery	72,000	2003
King Windows	ND[2]	1998
First Street	ND	1998
Great Triangle	3	1998
Whig Street	ND	1998
Luminite	AE[3]	AE
Ninth Street Landfill	4	1998
State Street	AE	AE
Railroad Avenue	ND	2003

Sediments and Surface Water

Sediment and surface water samples were collected from 13 locations along the Little Valley Creek and its tributaries. TCE was not detected in any sediments and at only low levels in surface waters. Potential TCE degradation

1 *Division Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels*, NYSDEC, Division of Hazardous Waste Remediation, January 24, 1994.

There are currently no federal or state promulgated standards for contaminant levels in soils. There are, however, other federal or state advisories, criteria, or guidance (To-Be-Considered guidance or "TBCs"), one of which is the New York State TAGM objectives. The soil cleanup objectives identified in NYSDEC's TAGM are either a human-health protection value or a value based on protection of groundwater (calculating the concentration in soil which would theoretically produce contaminant concentrations in the groundwater which would meet groundwater standards), whichever is more stringent. The TAGM is being used as the soil cleanup levels for this site. The TAGM for TCE is 700 μg/kg, which falls within EPA's acceptable risk range.

2 ND=Not detected.

3 AE=Area eliminated from consideration based on 1997 soil gas screening results. No soil samples were collected.

products, such as, cis-1,2-DCE, 1,2-DCA, chloromethane, and chloroethane, were present at low levels in the sediments and surface water adjacent to the Bush Industries and Cattaraugus Cutlery Areas.

Groundwater

A total of 313 groundwater samples were collected from 125 locations in an attempt to identify source areas.

As can be seen in Table 2, below, while the groundwater samples showed a valley-wide distribution of TCE, the Maximum Contaminant Level (MCL)[4] was only marginally exceeded in the Great Triangle (14 µg/L; also the maximum historical concentration) and the Ninth Street Landfill (19 µg/L; also the maximum historical concentration) Areas. While the concentration of TCE at the Luminite Area (10 µg/L) exceeded the MCL in 1998, the most recent sample results for this area (2003) show groundwater TCE levels to be below MCLs.

The results of groundwater sampling at the Bush Industries Area indicate the presence of elevated levels of TCE (the most recent sample results show a maximum concentration of 78 µg/L) and its breakdown products (such as 1,2-dichloroethene). The concentration of TCE decreases as the groundwater traverses the property; however, the concentration exceeds the MCL at the property boundary.

A review of the historical groundwater sample results from the Bush Industries Area show that natural attenuation is occurring. TCE concentrations in the two most contaminated monitoring wells have decreased from 230 µg/L and 160 µg/L in samples collected in 1999 to 36 µg/L and 78 µg/L in samples collected in 2003[5], respectively.

For the Cattaraugus Cutlery Area, groundwater concentrations of TCE were as high as 76 µg/L. Sample results do not show a downward trend over time in specific monitoring wells. While TCE concentrations were found to decrease by an order of magnitude as the groundwater traverses the property, TCE concentrations still exceed the MCL at the property boundary.

Table 2: Maximum Groundwater TCE Concentrations (most recent data)

Area	Maximum TCE Concentration (µg/L)	Year
Bush Industries	78	2003
Cattaraugus Cutlery	76	2003
King Windows	2	1998
First Street	ND[6]	1998
Great Triangle	14	2003
Whig Street	2.1	2003
Luminite	4.4	2003
Ninth Street Landfill	19	1998
State Street	AE[7]	AE
Railroad Avenue	1.9	2003

The groundwater plume was evaluated based upon private well data which has been collected since 1989. Of the 91 private wells that have treatment units installed, 90 were sampled in October 2004[8]. The results show that 49 are at or below the drinking water standard of 5 µg/L for TCE. Of the 41 wells that have contaminant levels exceeding the drinking water standard, the majority of these wells only marginally exceed 5 µg/L (32 wells have TCE levels between 6 µg/L and 10 µg/L). In addition, sampling results since 1989 indicate that there are decreasing levels of contamination throughout the plume in all but a few wells[9]; the highest concentration for the October 2004 sampling event was 22 µg/L, as compared to an historical high of 50 µg/L, and the average concentration is now 5.9 µg/L.

TCE in groundwater was identified as a chemical of potential concern (COPC) for soil vapor migration from groundwater to indoor air in the study area.

Summary

Based upon the soil data, the Cattaraugus Cutlery Area has been determined to be a current localized source of groundwater contamination at the Site. In addition, TCE

4 EPA and the New York State Department of Health (NYSDOH) have promulgated health-based protective MCLs, which are enforceable standards for various drinking water contaminants. MCLs ensure that drinking water does not pose either a short- or long-term health risk. The MCL for TCE is 5 micrograms per liter (µg/L).

5 The other monitoring wells in this area, for the most part, have shown TCE concentrations either below or marginally above the MCL.

6 ND=Not detected.

7 AE=Area eliminated from consideration based on 1997 soil gas screening results. No groundwater samples were collected.

8 One property is vacant; the well was inaccessible.

9 These wells are located in the vicinity of the Great Triangle Area.

WHAT IS RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the chemicals of concern (COCs) at the site in various media (*i.e.*, soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil. Factors relating to the exposure assessment include, but are not limited to, the concentrations that people might be exposed to and the potential frequency and duration of exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health effects, such as changes in the normal functions of organs within the body (*e.g.*, changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and non-cancer health effects.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one-in-ten-thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions explained in the Exposure Assessment. Current Superfund guidelines for acceptable exposures are an individual lifetime excess cancer risk in the range of 10^{-4} to 10^{-6} (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk) with 10^{-6} being the point o departure. For non-cancer health effects, a "hazard index" (HI) is calculated. An HI represents the sum of the individual exposure levels compared to their corresponding reference doses. The key concept for a non-cancer HI is that a "threshold level" (measured as an HI of less than 1) exists below which non-cancer health effects are not expected to occur.

concentrations in the groundwater underlying this area exceed the MCL and do not appear to be decreasing over time in specific monitoring wells. Based upon the TCE concentrations that were detected in the soil and the TCE concentrations which exceed MCLs in the groundwater, the Bush Industries Area also appears to be a current localized source of groundwater contamination. The TCE levels in this area, however, appear to be decreasing due to natural attenuation.

The Great Triangle and Ninth Street Landfill Areas have TCE concentrations in the groundwater that exceed the MCL, but due to the low levels of TCE detected in the soils in these areas, it is likely that these areas were former sources of TCE contamination. Until recently, the groundwater underlying the Luminite Area exceeded the MCL for TCE. At present, the groundwater in this area is below the MCL. While the Great Triangle, Luminite, and Ninth Street Landfill Areas may have been sources of groundwater contamination in the past, based upon the current data, they are not acting as current sources.

SITE RISKS

Based upon the results of the RI, a baseline human health risk assessment was conducted to estimate the risks associated with current and future property conditions.

The human-health estimates summarized below are based on current reasonable maximum exposure scenarios and were developed by taking into account various conservative estimates about the frequency and duration of an individual's exposure to TCE, as well as the toxicity of this contaminant.

A screening level ecological risk assessment was also conducted to assess the risk posed to ecological receptors due to Site-related contamination.

Human Health Risk Assessment

The human health risk assessment examined potential exposures of current and possible future receptors to Site soils, groundwater, surface water, and sediment in accordance with the conceptual site model developed for the Site.

Based upon the results of the risk assessment, it has been concluded that TCE is a COC for commercial workers in the Cattaraugus Cutlery Area relative to potential exposures to soil; the estimated excess lifetime cancer risk is 7.6 x 10^{-4}. TCE is also a COC in the Site-wide groundwater when used as process water in commercial wash down and commercial car wash scenarios, with estimated excess cancer risks of 2.6 x 10^{-4} and 2.6 x 10^{-3}, respectively.

TCE in the groundwater is a COPC for soil vapor migration from groundwater to indoor air, based on groundwater concentrations exceeding the health-based screening criteria of 5.3 µg/L. This value, which represents a cancer risk of one in ten thousand (10^{-4}), is based upon EPA's 2002 *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils.*

Under all scenarios, the total estimated HI value is less than one. Therefore, no non-cancer health effects are expected to occur.

Since point-of-use treatment systems have been installed on all of the affected drinking water wells, there is no current unacceptable risk associated with exposure to the contaminated groundwater from these wells.

Ecological Risk Assessment

Based upon the results of the ecological risk assessment, it has been concluded that the TCE present in the surface soils at the Cattaraugus Cutlery Area poses a low risk to terrestrial ecological receptors.

Surface water sampling revealed detections of TCE and TCE degradation products below corresponding ecoscreening benchmarks, and low-level TCE degradation products are also present in the sediments. The risk posed to ecological receptors by the TCE and its degradation products in the surface water and sediments in these areas is low.

The Bush Industries and Cattaraugus Cutlery Areas were found only limited value for ecological receptors, since only a small amount of terrestrial/wetland habitat (consisting of small isolated fragments of deciduous woodland or open field) exist for both.

A field-based qualitative benthic macroinvertebrate survey for both Little Valley Creek and an unnamed tributary to Little Valley Creek revealed the presence of a diverse benthic community in both water bodies. These communities did not display significant alterations in community structure in either area.

SUMMARY OF HUMAN HEALTH AND ECOLOGICAL RISKS

The risks presented in the human health risk assessment indicate that there is significant potential risk to commercial workers from direct exposure to contaminated soils in the Cattaraugus Cutlery Area and to commercial workers from exposure to contaminated groundwater used as process water or commercial car washes. These risk estimates are based on current reasonable maximum exposure scenarios and were developed by taking into account various conservative assumptions about the frequency and duration of an individual's exposure to the soil and groundwater, as well as the toxicity of TCE.

In addition, based on groundwater concentrations of TCE which exceed the health-based screening criteria, there is a potential risk related to soil vapor migration from groundwater to indoor air of homes and businesses.

Since point-of-use treatment systems have been installed on all of the affected drinking water wells, there is no current unacceptable risk associated with exposure to the contaminated groundwater from these wells.

The findings of the ecological risk assessment indicate that the potential risks to ecological receptors from TCE is expected to be low.

Based upon the results of the RI and the risk assessments, EPA has determined that actual or threatened releases of hazardous substances from the source areas, if not addressed by the preferred remedy or one of the other active measures considered, may present a current or potential threat to human health and the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), TBC guidance, and site-specific risk-based levels.

The following RAOs were established for the Site:

- Minimize or eliminate TCE migration from contaminated soils to the groundwater;
- Minimize or eliminate any contaminant migration from contaminated soils and groundwater to indoor air;
- Restore groundwater to meet state and federal standards for TCE within a reasonable time frame;
- Mitigate the migration of the affected groundwater; and
- Reduce or eliminate any direct contact or inhalation threat associated with TCE-contaminated soils and groundwater and any inhalation threat associated with soil vapor.

Soil cleanup objectives will be those established in the TAGM guidelines. Groundwater cleanup goals will be the more stringent of the state or federal promulgated standards.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective, comply with ARARS, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA §121(d), 42 U.S.C. §9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4).

Detailed descriptions of the remedial alternatives for addressing the contamination associated with the Site can be found in the FS report. This document presents four soil remediation alternatives and four groundwater remediation alternatives. To facilitate the presentation and evaluation of these alternatives, the FS report alternatives were modified to formulate the remedial alternatives discussed below.

It should be noted that although the FS report evaluated *in-situ* chemical oxidation for treatment of the TCE-contaminated groundwater at the Site, this technology is not being considered in this Proposed Plan because it is very similar to the *in-situ* air sparging alternative evaluated in the FS report, which would cost significantly less to implement. It should also be noted that active remedial measures were not considered for the Site-wide plume because there is an overall downward trend of TCE contamination in the plume.

All of the property owners/renters with drinking water wells that are protected with point-of-use treatment units are aware of the fact that the groundwater they use is contaminated and should not be used without treatment. They are reminded of this on a periodic basis when NYSDEC collects samples from their wells and/or provides maintenance related to their individual point-of-use treatment units. Therefore, institutional controls to control human exposure to contaminated groundwater from these properties until groundwater standards are met are not necessary.

A number of institutional controls—notices, deed restrictions, contractual agreements, and informational devices (*e.g.*, notifications) were considered to further control human exposure to contaminated groundwater underlying the Bush Industries and the Cattaraugus Cutlery properties until groundwater standards are met. Bush Industries and the facility on the Cattaraugus Cutlery property use public water. In addition, groundwater standards are expected to be achieved in these areas through monitored natural attenuation in 10 years, and monitoring in these areas would allow for periodic inspections to determine whether groundwater is being used without treatment. Therefore, it was concluded that notification of these property owners, in combination with the periodic inspections, would be sufficiently protective of public health until groundwater standards are achieved.

A number of institutional controls were also considered to prevent human exposure to contaminated groundwater underlying the undeveloped parcels within the Site. It was concluded that since groundwater standards are expected to be achieved through monitored natural attenuation in 10 years, periodic notification of local government agencies would be sufficiently protective of public health until groundwater standards are achieved.

For all of the groundwater alternatives, EPA would continue to protect public health with the point-of-use treatment units that were installed pursuant to the September1996 remedy decision for this Site.

The construction time for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate the performance of the remedy with any potentially responsible parties, or procure contracts for design and construction.

The remedial alternatives are described below.

Soil Remedial Alternatives

Alternative S-1: No Action

Capital Cost:	$0
Annual Operation and Maintenance Cost:	$0
Present-Worth Cost:	$0
Construction Time:	0 months

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative for soil does not include any physical remedial measures that address the problem of soil contamination at the Site.

Because this alternative would result in contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the contaminated soils.

Alternative S-2: Institutional Controls

Capital Cost:	$20,000
Annual Operation and Maintenance Cost:	$1,000
Present-Worth Cost:	$33,000
Construction Time:	6 months

This alternative involves the implementation of a public awareness program and institutional controls (the placement of limitations on the future use of the property) related to the Cattaraugus Cutlery Area.

The public awareness program would be directed toward on-property workers and residents in the vicinity of the Cattaraugus Cutlery Area, and would include the preparation and distribution of fact sheets and the convening of public meetings.

Under this alternative, institutional controls, such as a notice, deed restriction, or contractual agreement, would be used to prohibit the future use of the Cattaraugus Cutlery Area in a manner that would be inconsistent with on-property conditions (*e.g.*, prohibiting soil excavation activities).

The property would be inspected annually to determine whether soil excavation activities had occurred. If a notice or deed restriction were employed, property records would be searched annually to ensure that these controls are still in place. Local governmental offices, such as building and zoning offices, would be notified annually of the controls on the property and their records would also be reviewed annually to ascertain whether or not any applications or other filings had been made regarding the property. An annual report summarizing the findings of the above-noted activities would be prepared.

It is estimated that it would take six months to implement the institutional controls.

Because this alternative would result in contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the contaminated soils.

Alternative S-3: *In-Situ* Soil Vapor Extraction

Capital Cost:	$275,000
Annual Operation and Maintenance Cost:	$0
Present-Worth Cost:	$275,000
Construction Time:	12 months

Under this alternative, approximately 200 cubic yards of TCE-contaminated soil in the Cattaraugus Cutlery Area would be remediated by *in-situ* soil vapor extraction (ISVE). ISVE involves drawing air through a series of wells to volatilize the solvents in the soils. The extracted vapors would then be treated.

The exact configuration and number of vacuum extraction wells would be determined based on the results of a pilot-scale treatability study.

While the actual period of operation of the ISVE system would be based upon soil sampling results which demonstrate that the affected soils have been treated to soil TAGM objectives, it is estimated that the system would operate for a period of 12 months.

Alternative S-4: Excavation and Off-Site Disposal

Capital Cost:	$136,000
Annual Operation and Maintenance Cost:	$0
Present-Worth Cost:	$136,000
Construction Time:	3 months

This alternative involves the excavation of approximately 200 cubic yards of TCE-contaminated soil to an estimated depth of four feet in two areas of the Cattaraugus Cutlery Area. The actual extent of the excavation and the volume of the excavated soil would be based on pre- and post-excavation confirmatory sampling. Shoring of the excavated areas and extraction and treatment of any water that enters the excavated area may be necessary.

The excavated areas would be backfilled with clean fill. All excavated material would be characterized and transported for treatment and/or disposal at an off-Site Resource Conservation and Recovery Act (RCRA)-compliant disposal facility.

It is estimated that this effort could be completed in three months.

Groundwater Remedial Alternatives

Alternative GW-1: No Action

Capital Cost:	$0
Annual Operation and Maintenance Cost:	$0
Present-Worth Cost:	$0
Construction Time:	0 months

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative would not include any physical remedial measures to address the groundwater contamination at the Site.

Based on preliminary groundwater modeling, it has been estimated that it would take ten years for the groundwater to be restored to drinking water quality under the no action alternative.

Because this alternative would result in contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented.

Alternative GW-2: Monitored Natural Attenuation of Source Areas and Site-Wide Plume with Institutional Controls

Capital Cost:	$0
Annual Operation and Maintenance Cost:	$35,000
Present-Worth Cost:	$245,000
Construction Time:	1 month

Under this alternative, the contaminated groundwater underlying the Bush Industries, Cattaraugus Cutlery, Great Triangle, and Ninth Street Landfill Areas, as well as the Site-wide plume, would be addressed through monitored natural attenuation, a variety of *in-situ* processes which, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. For this Site, these *in-situ* processes include dispersion, dilution, and adsorption; limited degradation may be occurring in select areas of the Site, particularly in the suspected source areas.

Groundwater samples would be collected and analyzed regularly in order to verify that the concentrations and the extent of groundwater contaminants are declining. The exact frequency and parameters of sampling would be determined during the design phase.

This alternative would also include institutional controls. Specifically, after an initial notification, NYSDEC, NYSDOH, and/or CCHD would periodically meet with or notify local governmental agencies to remind them that if any unimproved parcel where the underlying groundwater is contaminated with TCE above the MCL is developed, the groundwater should not be used without treatment. EPA would also notify the Bush Industries and Cattaraugus Cutlery Area property owners that the underlying groundwater is contaminated and should not be used without treatment. As part of EPA's monitored natural attenuation monitoring on the Bush Industries and Cattaraugus Cutlery Areas, the properties would be inspected annually to verify that wells without treatment systems have not been installed. An annual report summarizing the results of the groundwater monitoring and the findings of such inspections would be prepared.

It is estimated that it would take 1 month to implement the institutional controls.

Based on preliminary groundwater modeling, it has been estimated that it would take ten years for the groundwater to be restored to drinking water quality.

Because this alternative would result in contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented.

Alternative GW-3: Source Area Extraction and Treatment and Site-Wide Plume Monitored Natural Attenuation with Institutional Controls

Capital Cost:	$2,564,000
Annual Operation and Maintenance Cost:	$589,000
Present-Worth Cost:	$5,921,000
Construction Time:	6 months

This alternative is the same as Alternative GW-2, except instead of relying upon monitored natural attenuation to address the contaminated groundwater underlying the Bush Industries and Cattaraugus Cutlery Areas, it would be removed with extraction wells (two on the Bush Industries Area and two wells on the Cattaraugus Cutlery Area). The Great Triangle and Ninth Street Landfill Areas, as well as the Site-wide plume, would be addressed through monitored natural attenuation, as in Alternative GW-2.

The extracted groundwater would be collected, treated by air-stripping to discharge standards, and discharged to the Little Valley Creek. Air stripping involves pumping untreated groundwater to the top of a "packed" column, which contains a specified amount of inert packing material. The column receives ambient air under pressure in an upward direction from the bottom of the column as the water flows downward, transferring volatile organic compounds (VOCs) to the air phase.

Based on preliminary groundwater modeling, it has been estimated that it would take eight years to remediate the groundwater at the Bush Industries and Cattaraugus Cutlery Areas using extraction and treatment. It has been estimated that it would also take eight years for the contaminated groundwater underlying the Great Triangle and Ninth Street Landfill Areas, as well as the Site-wide plume, to be restored to drinking water quality through natural attenuation.

Because this alternative would result in contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that the site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented.

Alternative GW-4: Source Area *In-Situ* Air Sparging and Site-Wide Plume Natural Attenuation with Institutional Controls

Capital Cost:	$860,000
Annual Operation and Maintenance Cost:	$322,000
Present-Worth Cost:	$1,562,000
Construction Time:	6 months

This alternative is the same as Alternative GW-2, except instead of relying upon monitored natural attenuation to address the contaminated groundwater underlying the Bush Industries and Cattaraugus Cutlery Areas, it would be treated with air sparging. The Great Triangle and Ninth Street Landfill Areas, as well as the Site-wide plume, would be addressed through monitored natural attenuation, as in Alternative GW-2.

In-situ air sparging involves injecting air, under pressure, into the aquifer via injection wells. Under this process, bubbles are formed from the injected air, which strip the VOCs from the groundwater. A vapor extraction system would be used to remove and treat the vapors generated. Performance and compliance monitoring and testing would be undertaken to assess the effectiveness of the in-situ air sparging system.

Based on preliminary groundwater modeling, it has been estimated that it would take two years to remediate the groundwater at the Bush Industries and Cattaraugus Cutlery Areas using air sparging. It has been estimated that it would take eight years for the contaminated groundwater underlying the Great Triangle and Ninth Street Landfill Areas, as well as the Site-wide plume, to be restored to drinking water quality through natural attenuation.

Because this alternative would result in contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented.

COMPARATIVE ANALYSIS OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria, namely, overall protection of human health and the environment, compliance with applicable or relevant and appropriate requirements, long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, cost, and state and community acceptance.

The evaluation criteria are described below.

- Overall protection of human health and the environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
- Compliance with ARARs addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and requirements or provide grounds for invoking a waiver.
- Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.
- Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.
- Short-term effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.
- Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
- Cost includes estimated capital and operation and maintenance costs, and net present-worth costs.
- State acceptance indicates if, based on its review of the RI/FS and Proposed Plan, the state concurs with the preferred remedy at the present time.
- Community acceptance will be assessed in the ROD and refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports.

Overall Protection of Human Health and the Environment

Alternatives S-1 and S-2 would not be protective of human health and the environment, since they would not actively address the contaminated soils, which present unacceptable risks of exposure and are a source of groundwater contamination. Alternatives S-3 and S-4 would be protective of human health and the environment, since each alternative relies upon a remedial strategy or treatment technology capable of eliminating human exposure and removing the source of groundwater contamination.

Sampling and preliminary modeling results indicate that Alternatives GW-1 and GW-2 would meet state and federal groundwater standards through natural attenuation in an estimated 10 years (after an active soil remedy is implemented). Alternative GW-2 is somewhat more protective of human health than Alternative GW-1 because groundwater monitoring would be performed and institutional controls would be implemented to prevent the installation and use of groundwater wells at the Bush Industries and Cattaraugus Cutlery Areas. Alternatives GW-3 and GW-4 would actively address the contaminants in the groundwater at the Bush Industries and Cattaraugus Cutlery Areas until concentrations are reduced to federal and state groundwater standards (estimated to be eight years and two years, respectively). It would take an estimated eight years to achieve the MCL in the Great Triangle and Ninth Street Landfill Areas, as well as the Site-wide plume, under these alternatives.

Although Alternatives GW-3 and GW-4 would be more protective of the environment than Alternatives GW-1 and GW-2 since MCLs would be reached sooner and would minimize the migration of contaminated groundwater, the groundwater is only marginally contaminated and there is no current direct contact risk of human exposure associated with the groundwater, since all of the affected wells have treatment systems installed. There may, however, be a potential inhalation risk posed by vapor migration from groundwater to indoor air. If soil vapor intrusion is determined to be a problem at the Site, this risk would also be mitigated.

Until groundwater standards are met under Alternatives GW-2, GW-3, and GW-4, there would be a continued risk of human exposure to the contaminated groundwater. This risk would be mitigated by the continued use of the point-of-use treatment systems.

Compliance with ARARs

There are currently no federal or state promulgated standards for contaminant levels in soils. However, EPA is utilizing New York State soil cleanup objectives as specified in the soil TAGM (which are used as TBC criteria).

Since the contaminated soils would not be addressed under Alternatives S-1 and S-2, they would not comply with the soil cleanup objectives. Alternatives S-3 and S-4 would attain the soil cleanup objectives specified in the TAGM.

Alternative S-4 would involve the excavation of contaminated soils and would, therefore, require compliance with fugitive dust and VOC emission regulations. In addition, this alternative would be subject to New York State and federal regulations related to the transportation and off-site treatment/disposal of wastes. In the case of Alternative S-3, compliance with air emission standards would be required for the ISVE system. Specifically, treatment of off-gases would have to meet the substantive requirements of New York State Regulations for Prevention and Control of Air Contamination and Air Pollution (6 NYCRR Part 200, *et seq.*) and comply with the substantive requirements of other state and federal air emission standards.

EPA and NYSDOH have promulgated health-based protective MCLs (40 CFR Part 141, and 10 NYCRR, Chapter 1 and Part 5), which are enforceable standards for various drinking water contaminants (chemical-specific ARARs). The aquifer at the Site is classified as Class GA (6 NYCRR 701.18), meaning that it is designated as a potable water supply. Alternatives GW-1 and GW-2 do not include any active groundwater remediation; groundwater ARARs would be achieved through natural attenuation within an estimated ten years after the soil remedy is implemented. For Alternatives GW-3 and GW-4, ARARs would be achieved through the removal and in-situ treatment of contaminants in the groundwater at the two source areas, respectively, and through natural attenuation in the Great Triangle and Ninth Street Landfill Areas, as well as the Site-wide plume. Alternatives GW-3 and GW-4 would have to comply with surface water discharge requirements and the disposition of treatment residuals would have to be consistent with RCRA. Any air emissions associated with the treatment system would have to comply with air emission standards.

The requirements of New York State Environmental Conservation Law Section 27-1318, Institutional and Engineering Controls, would be applicable to the institutional controls included in Alternatives S-2, GW-2, GW-3, and GW-4.

Long-Term Effectiveness and Permanence

Alternatives S-1 and S-2 would involve no active remedial measures and, therefore, would not be effective in eliminating the potential exposure to contaminants in soil and would allow the continued migration of contaminants from the soil to the groundwater. Alternatives S-3 and S-4 would both be effective in the long term and would provide permanent remediation by either removing the contaminated soils from the Site or treating them in place.

Alternative S-3 would generate treatment residuals which would have to be appropriately handled. Alternatives S-1, S-2 and S-4 would not generate such residuals.

Once the source control remedy is implemented, it is anticipated that all of the groundwater alternatives would achieve groundwater ARARs within a reasonable time frame and would be effective in the long-term. It is anticipated that all of the alternatives would maintain reliable protection of human health and the environment over time.

Alternatives GW-3 and GW-4 would generate treatment residues which would have to be appropriately handled. Alternatives GW-1 and GW-2 would not.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternatives S-1 and S-2 would provide no reduction in toxicity, mobility or volume. Under Alternative S-3, the toxicity, mobility, and volume of contaminants would be reduced or eliminated through on-Site treatment. Under Alternative S-4, the toxicity, mobility, and volume of the contaminants would be eliminated by removing the contaminated soil from the property.

Alternatives GW-1 and GW-2 would rely solely upon natural attenuation to reduce the volume of groundwater contamination. Alternatives GW-3 and GW-4 would provide a reduction of toxicity, mobility, and volume of the contaminated groundwater through treatment of the contaminated groundwater at the Bush Industries and Cattaraugus Cutlery Areas. All of the groundwater alternatives would rely upon natural attenuation to address the groundwater contamination in the Great Triangle and Ninth Street Landfill Areas, as well as the Site-wide plume.

Short-Term Effectiveness

Alternatives S-1 and S-2 do not include any physical construction measures in any areas of contamination and, therefore, would not present any potential adverse impacts to on-property workers or the community as a result of its implementation. Alternative S-3 could result in some adverse impacts to on-property workers through dermal contact and inhalation related to the installation of ISVE wells through contaminated soils. Alternative S-4 could present some limited adverse impacts to on-property workers through dermal contact and inhalation related to excavation activities. Noise from the treatment unit and the excavation work associated with Alternatives S-3 and S-4, respectively, could present some limited adverse impacts to on-property workers and nearby residents. In addition, interim and post-remediation soil sampling activities would pose some risk. The risks to on-property workers and nearby residents under all of the alternatives could, however, be mitigated by following appropriate health and safety protocols, by exercising sound engineering practices, and by utilizing proper protective equipment.

Alternative S-4 would require the off-Site transport of contaminated soil (approximately 13 truck loads), which may pose the potential for traffic accidents, which in turn could result in releases of hazardous substances.

For Alternative S-4, there is a potential for increased stormwater runoff and erosion during construction and excavation activities that would have to be properly managed to prevent or minimize any adverse impacts. For this alternative, appropriate measures would have to be taken during excavation activities to prevent transport of fugitive dust and exposure of workers and downgradient receptors to VOCs.

Since no actions would be performed under Alternative S-1, there would be no implementation time. It is estimated that Alternative S-2 would be completed in three6 months. It is estimated that Alternative S-3 would require nine months to install the ISVE system and twelve months to achieve the soil cleanup objectives. It is estimated that it would take three months to excavate and transport the contaminated soils to an EPA-approved treatment/disposal facility under Alternative S-4.

Alternatives GW-1 and GW-2 do not include any active remediation; therefore, they would not present an additional risk to the community or workers resulting from activities at the Site. Alternatives GW-1GW-2, GW-3, and GW-24 would present some risk to on-property workers through dermal contact and inhalation from groundwater sampling activities, which could be minimized by utilizing proper protective equipment. Alternatives GW-3 and GW-4, which would require the installation of groundwater extraction or air sparging injection wells through potentially contaminated soils and groundwater, would present some risk to on-property workers through dermal contact and inhalation from construction and groundwater sampling activities. Noise from the treatment units associated with Alternatives GW-3 and GW-4 could present some limited adverse impacts to on-property workers and nearby residents. The risks to on-property workers and nearby residents under all of these alternatives could, however, be minimized by following appropriate health and safety protocols, exercising sound engineering practices, and utilizing proper protective equipment.

Since no actions would be performed under Alternative GW-1, there would be no implementation time. It is estimated that Alternative GW-2 would be completed in 1 month. It is estimated that Alternatives GW-3 and GW-4 would require 6 months to install the groundwater extraction and treatment system and in-situ treatment system, respectively.

Based upon preliminary groundwater modeling, it has been estimated that the contaminated groundwater would naturally attenuate to groundwater standards at the Bush Industries, Cattaraugus Cutlery, Great Triangle, and Ninth Street Landfill Areas, as well as the Site-wide plume in ten years (after an active soil remedy is implemented). By comparison, Alternative GW-3 would achieve groundwater standards at the Bush Industries, Cattaraugus Cutlery, Great Triangle, and Ninth Street Landfill Areas, as well as the Site-wide plume in an estimated eight years. Alternative GW-4 would achieve groundwater standards at the two source areas in an estimated two years; it would achieve groundwater standards in the Great Triangle and Ninth Street Landfill Areas, as well as the Site-wide plume in an estimated eight years.

The actual time period required for the groundwater to be remediated under all of the alternatives may vary from the estimates above and could be refined based on the results of groundwater monitoring and more comprehensive groundwater modeling.

Implementability

Alternatives S-1 and S-2 would be the easiest soil alternatives to implement, as there are no activities to undertake.

Both Alternatives S-3 and S-4 would employ technologies known to be reliable and that can be readily implemented. In addition, equipment, services, and materials needed for these alternatives are readily available, and the actions under these alternatives would be administratively feasible. Sufficient facilities are available for the treatment/disposal of the excavated materials under Alternative S-4.

Monitoring the effectiveness of the ISVE system under Alternative S-3 would be easily accomplished through soil and soil-vapor sampling and analysis. Under Alternative S-4, determining the extent of the soil cleanup could be easily accomplished through post-excavation soil sampling and analysis.

Alternative GW-1 would be the easiest groundwater alternative to implement, since it would require no activities. With the performance of institutional controls and monitoring, Alternative GW-2 would require more effort to implement than Alternative GW-1, but would be easily implemented. Alternative GW-3 (groundwater extraction and treatment) would be the most difficult to implement in that it would require the construction of a groundwater extraction system and pipelines. The services and materials that would be required for the implementation of all of the groundwater remedial alternatives are readily available.

All treatment equipment that would be used in Alternatives GW-3 and GW-4 are proven and commercially available. Transportation and disposal of treatment residues could be easily implemented using commercially-available equipment. Under these alternatives, sampling for treatment effectiveness and groundwater monitoring would be necessary, but could be easily implemented.

Cost

The estimated capital, operation and maintenance (O&M) (which includes monitoring), and present-worth costs for each of the alternatives are presented in the table, below.

Alternative	Capital	Annual O&M	Total Present-Worth
S-1	$0	$0	$0
S-2	$20,000	$1,000	$33,000
S-3	$275,000	$0	$275,000
S-4	$136,000	$0	$136,000
GW-1	$0	$0	$0
GW-2	$0	$35,000	$245,000
GW-3	$2,564,000	$589,000	$5,921,000
GW-4	$860,000	$322,000	$1,562,000

There are no annual O&M costs associated with the soil alternatives other than annual inspections and reviews related to the institutional controls associated with Alternative S-2. The present-worth cost associated with this alternative was calculated using a discount rate of seven percent and a 30-year time interval. The present-worth costs for the groundwater monitoring components of Alternatives GW-2, GW-3, and GW-4 were calculated using ten-, eight-, and eight-year time intervals, respectively. The present-worth costs for the remaining components of Alternatives GW-3 and GW-4 were calculated using eight-year (groundwater extraction and treatment) and two-year (in-situ air sparging) time intervals, respectively.

As can be seen by the cost estimates, Alternative S-1 is the least costly soil alternative at $0. Alternative S-3 is the most costly soil alternative at $275,000. The least costly groundwater alternative is GW-1 at $0. Alternative GW-3 is the most costly groundwater alternative at $5,921,000.

State Acceptance

NYSDEC concurs with the preferred source control and groundwater alternatives.

Community Acceptance

Community acceptance of the preferred alternative will be assessed in the ROD, following review of the public comments received on the Proposed Plan.

PROPOSED REMEDY

Based upon an evaluation of the various alternatives, EPA, in consultation with NYSDEC, recommends Alternative S-4, Excavation/Off-Site Disposal, and Alternative GW-2, Monitored Natural Attenuation of Source Areas and Site-wide plume with Institutional Controls, as the preferred remedy to address the soil and groundwater, respectively.

Specifically, this would involve the following:

- Excavation of approximately 200 cubic yards of TCE-contaminated soil exceeding the TAGM objective of 700 µg/kg to an estimated depth of four feet at two locations in the Cattaraugus Cutlery Area;

- Post-excavation, confirmatory soil sampling;
- Backfilling of excavated areas with clean fill;
- Characterization and transportation of excavated material for treatment and/or disposal at an off-Site RCRA-compliant disposal facility;
- Monitored natural attenuation of the contaminated groundwater underlying the Bush Industries, Cattaraugus Cutlery, Great Triangle, and Ninth Street Landfill Areas, as well as the Site-wide plume; and
- Groundwater sample collection and analyses to verify that the contaminants are declining in concentration and in extent.

This alternative would also include institutional controls. Specifically, after an initial notification, NYSDEC, NYSDOH, and/or CCHD would periodically meet with or notify local governmental agencies to remind them that if any unimproved parcel where the underlying groundwater is contaminated with TCE above the MCL is developed, the groundwater should not be used without treatment. EPA would also notify the Bush Industries and Cattaraugus Cutlery Area property owners that the underlying groundwater is contaminated and should not be used without treatment. As part of EPA's natural attenuation monitoring on the Bush Industries and Cattaraugus Cutlery Areas, the properties would be inspected annually to verify that wells without treatment systems have not been installed. An annual report summarizing the results of the groundwater monitoring and the findings of such inspections would be prepared.

An evaluation of the potential for soil vapor intrusion into structures within the study area will be conducted; mitigation may be performed, if necessary.

Upon completion of remediation, no hazardous substances would remain above levels that would prevent unlimited use or unrestricted exposure. It is the policy of EPA to conduct five-year reviews when remediation activities will continue for more than five years. Under the preferred remedy, EPA would conduct five-year reviews at least once every five years.

Basis for the Remedy Preference

While Alternatives S-3 and S-4 would both effectively achieve the 700 µg/kg soil cleanup objective, Alternative S-3 would be significantly more expensive and would take longer to construct and implement than Alternative S-4. Therefore, EPA and NYSDEC believe that Alternative S-4 would effectuate the soil cleanup while providing the best balance of tradeoffs with respect to the evaluating criteria.

While Alternative GW-2 would not actively treat the groundwater, there is currently no threat of exposure to contaminated groundwater at the Site, since point-of-use treatment systems have been installed on all of the affected drinking water wells. In addition, a review of the historical groundwater sample results from the Bush Industries Area show that natural attenuation is occurring. Although sample results from groundwater monitoring wells in the Cattaraugus Cutlery Area do not show a downward trend over time, it is expected that in combination with removing the sources of TCE from the soil in this area under Alternative S-4, TCE concentrations in the groundwater will begin to diminish. Under Alternative GW-2, TCE levels are expected to attenuate to groundwater standards Site-wide in approximately ten years.

While Alternatives GW-3 and GW-4 would actively treat the groundwater in the two source areas, thereby achieving groundwater standards in these areas in an estimated eight years and two years, respectively, these alternatives are significantly more costly to implement than Alternative GW-2.

Therefore, EPA and NYSDEC believe that Alternative GW-2 would minimize the migration of contaminated groundwater at the Site, while providing the best balance of tradeoffs among the alternatives with respect to the evaluation criteria.

The preferred remedy is protective of human health and the environment, provides long-term effectiveness, will achieve the ARARs in a reasonable time frame, and is cost-effective. Therefore, the preferred remedy will provide the best balance of tradeoffs among the alternatives with respect to the evaluation criteria. EPA and NYSDEC also believe that the preferred remedy will treat principal threats and will utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

ALTERNATIVE WATER SUPPLY REMEDY

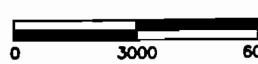
The 1996 ROD provided for the installation of point-of-use treatment units on all of the affected and potentially affected private wells to ensure that drinking water standards were met. The ROD also called for an evaluation of the efficacy of the point-of-use treatment systems within five years of their installation, and a determination as to whether or not a more permanent system (such as a water line) would be required. In the 2002 ESD, EPA determined that it would be more appropriate to evaluate the need for a permanent alternative water supply during the selection of a final remedy for the Site.

Of the 91 private wells that have treatment units installed, 90 were sampled in October 2004. The results show that 49 of the wells are at or below the drinking water standard of 5 µg/L for TCE. Of the 41 wells that have contaminant levels exceeding the drinking water standard, the majority of these wells only marginally exceed 5 µg/L (32 wells have TCE levels between 6 µg/L and 10 µg/L). In addition, sampling results since 1989 indicate that there are decreasing levels of contaminants in all but a few wells; the highest concentration for the October 2004 sampling event was 22 µg/L, as compared to an historical high of 50 µg/L, and the average concentration is now 5.9 µg/L. Also, there is no current unacceptable direct contact risk associated with exposure to the groundwater, since point-of-use treatment systems have been installed on all of the affected drinking water wells.

Since the point-of-use treatment systems need to be operated until MCLs are reached, the costs related to the O&M of these systems are impacted by the duration of the various groundwater alternatives. The estimated annual O&M cost for the point-of-use treatment systems is $101,000. For ten years of operation under the preferred alternative, Alternative GW-2, the overall present-worth cost is $710,000, as compared to an overall present-worth cost of $605,000 for eight years of operation under Alternatives GW-3 and GW-4. The estimated present-worth cost related to the construction, operation, and maintenance of a waterline ranges from $3.5 - $3.7 million.

Based on these findings, EPA proposes to continue to protect public health with the point-of-use treatment units that were installed pursuant to the 1996 remedy decision for this Site until groundwater standards are met, in approximately ten years. NYSDEC will continue to monitor the private wells and maintain the individual point-of-use treatment units until groundwater standards are met at the individual wells.

Support for this decision can be found in EPA's July 2004 *Comparison of Individual Water Treatment Systems and Permanent Water Supply Line Alternatives* (Appendix D of the FS report).



LEGEND:

NYSDEC POTENTIAL SOURCE AREAS:

- **A** BUSH INDUSTRIES AREA
- **B** NINTH STREET LANDFILL AREA
- **C** CATTARAUGUS CUTLERY AREA
- **D** KING WINDOWS (SECOND STREET) AREA
- **E** FIRST STREET AREA
- **F** GREAT TRIANGLE AREA
  - INCLUDES:
  - **F1** ENVIROTECH DRUM STORAGE
  - **F2** WESTERN BURNT HOUSE
  - **F3** WINSHIP CIRCLE/BAKER ROAD
  - **F4** TRIANGLE SOUTHWEST
- **G** WHIG STREET AREA
- **H** LUMINITE AREA
  - INCLUDES:
  - **H1** NORTH LUMINITE
  - **H2** LUMINITE PLANT AREA
  - **H3** SOUTH LUMINITE
- **I** STATE STREET AREA
- **J** RAILROAD AVENUE AREA
- **CDPWP** CATTARAUGUS COUNTY DEPARTMENT OF PUBLIC WORKS PROPERTY

APPROX. QUADRANGLE LOCATIONS

SOURCE:
BASE MAP ADAPTED FROM U.S.G.S. LITTLE VALLEY, ELLICOTTVILLE, SALAMANCA, AND CATTARAUGUS NEW YORK QUADRANGLES, 7.5 MINUTE SERIES (TOPOGRAPHIC).

LITTLE VALLEY SUPERFUND SITE
LITTLE VALLEY CATTARAUGUS COUNTY, NEW YORK
FIGURE 1 SITE BOUNDARY AND POTENTIAL SOURCE AREAS
TETRA TECH FW, INC.

RESPONSIVENESS SUMMARY

APPENDIX V-b

PUBLIC NOTICE PUBLISHED IN THE
***TIMES HERALD* AND THE *TWIN TIERS TRADER* ON JUNE 27, 2005**

THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY INVITES PUBLIC COMMENT ON THE PROPOSED REMEDY FOR THE LITTLE VALLEY SUPERFUND SITE

The U.S. Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC) will hold a public meeting on July 6, 2005 at 7 p.m., in the Little Valley Elementary Campus, school auditorium, 207 Rock City Street, Little Valley, New York to discuss the findings of the source investigation and control remedial investigation and feasibility study (RI/F/S) and the Proposed Plan for the Little Valley Superfund site (Site).

EPA is issuing the Proposed Plan as part of its public participation responsibilities under Section 117 (a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, and Section 300.430 (f) of the National Oil and Hazardous Substances Pollution Contingency Plan.

The primary objectives of this action are to remediate the sources of contamination at the site, reduce and minimize the downward migration of contaminants to the groundwater, restore groundwater quality, and minimize any potential future health and environmental impacts. The main features of the preferred remedy include excavation and off-site disposal of contaminated soils and monitored natural attenuation and institutional controls to address the contaminated groundwater at the site.

The remedy described in this Proposed Plan is the preferred remedy for the site. Changes to the preferred remedy or a change from the preferred remedy to another remedy may be made if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after EPA has taken into consideration all public comments. EPA is soliciting public comment on all of the alternatives considered in the detailed analysis of the RI/FS report because EPA and NYSDEC may select a remedy other than the preferred remedy.

The administrative record file, which contains the information upon which the selection of the response action will be based, is available at the following locations:

U.S. Environmental
Protection Agency
Public Information Office
186 Exchange Street,
Buffalo, NY 14204

Salamanca Public Library
155 Wildwood Avenue
Salamanca, NY 14779

Town Clerk's Office
103 Rock City Street
Little Valley, NY 14755

Responses to the comments received at the public meeting and in writing during the public comment period, which runs from June 27, 2005 to July 26, 2005, will be documented in the Responsiveness Summary section of the Record of Decision, the document which formalizes the selection of the remedy. All written comments should be addressed to:

Patricia Simmons Pierre
Remedial Project Manager
Central New York Remediation Section
United States Environmental Protection Agency
290 Broadway, 20th Floor
New York, NY 10007-1866
Telefax: (212) 637-3966
E-mail: pierre.patricia@epa.gov

In addition, if you have any other questions pertaining to this site please contact:

Mike Basile
Community Involvement Coordinator
Public Affairs Division
United States Environmental Protection Agency
186 Exchange Street
Buffalo, N.Y. 14204
(716) 551-4410
E-mail: basile.michael@epa.gov

RESPONSIVENESS SUMMARY

APPENDIX V-c

JULY 6, 2005 PUBLIC MEETING SIGN-IN SHEET

LITTLE VALLEY SUPERFUND SITE – PUBLIC MEETING

Little Valley Central School, Auditorium
207 Rock City Street, Little Valley, NY
July 6, 2005

PLEASE PRINT

NAME	ADDRESS	PHONE #
Cameron O'Connor	NYS DEC 584 Delaware Buffalo NY 14202	716 847 4385
M. L DOSTER	NYSDEC R9	716 851-7220
Mike • Donna Phillips	4306 Rt 353, Salamanca	945-1469
Eric Wehlers	Catt. Co. DOH, Olean, NY	716-373-8050
Brian Quinn	Salamanca Press	716-945-1644
Harriet Schauman	8224 Rt 242 Little Valley, NY	716-938-6104
Robert Schauman	" "	" "
Kelly M'Intosh	Geomatrix	716 565 0624
Donna Lipkow	5214 Rt.353 L. V.	716-938-6484
William D Farnham	208 8th LV	716-938-6408

LITTLE VALLEY SUPERFUND SITE – PUBLIC MEETING

Little Valley Central School, Auditorium
207 Rock City Street, Little Valley, NY
July 6, 2005

PLEASE PRINT

NAME	ADDRESS	PHONE #
Linda Ross	NYSDEC 270 Michigan Ave Buffalo, NY 14203	716-851-7220
David Szymanski	" " "	" " "
DiAnn Yonker	4116 Center St, Salamanca 14779	716-945-1459
Norman L Marsh	121 1st St. Little Valley	938-6620
[illegible]	5035 Rt 353 Salamanca NY	938-6894
M/M J V [illegible]	PO 5192 Rt 98 Java Ctr, NY 14082 300 [illegible] St L.V	585 457-3005
Dennis + Jane Sibley	5343 Winship Circ SALA.	938-6592
James Haley	4473 Rte 353	945-0560
Merle E. Burger	5444 Rt 353 L.V.	

RESPONSIVENESS SUMMARY

APPENDIX V-d

JULY 6, 2005 PUBLIC MEETING TRANSCRIPT

STATE OF NEW YORK : COUNTY OF CATTARAUGUS

IN RE:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

PUBLIC MEETING ON THE PROPOSED SUPERFUND SITE

DATE: July 6, 2005.

TIME: 7:00 P.M.

LOCATION: Little Valley Elementary Campus,
207 Rock City Street,
Little Valley, New York 14755.

APPEARANCES: MIKE BASILE,
US EPA Region 2,
Community Relations Specialist.

JOEL SINGERMAN,
US EPA Region 2,
Section Chief, Central New York.

PATRICIA SIMMONS PIERRE,
Project Manager,
Little Valley Site.

RICHARD FEENEY,
Tetra Tech EC Inc.

PRESENT: SANDRA SMITH LIPKE,
Notary Public.

MR. BASILE: Good evening. My name is Mike Basile, the Community Involvement Coordinator for the United States Environmental Protection Agency Region 2. The purpose of this evening's meeting is to simply explain our agency's proposed cleanup plan that we are recommending to you, and also which has the concurrence of the New York State Department of Environmental Conservation

We did mail out copies of the proposed plan to our active mailing list, and I sincerely hope that as you did arrive this evening, you picked up a copy of the agenda and you did sign in, because that's how we actually build our mailing list.

We are currently in a thirty-day public comment period, which began on June 27th and which will end on July 26. We value public input and we're happy that you're here this evening and we encourage your comments, both verbal and written. If you leave this evening's meeting and realize you still have some comments, we ask you to send your comments in writing to Patricia Simmons Pierre, who is our remedial project manager, who will be making a presentation later this evening. Her name and address is on the bottom of the agenda, if you picked it up at the sign-in table.

We have established two informational repositories for the site that have all the documents that are available for public review and these two repositories are in your community. They are the Town of Little Valley Municipal Building on Rock City Street here in Little Valley and the Salamanca Public Library on Wildwood Avenue in Salamanca.

You notice we have a stenographer here this evening to capture everyone's comments, because once again, we value your input. As a facilitator for this evening's meeting, I sincerely ask that you give our three presenters, whose names are on the agenda, give them an opportunity to complete their presentations and then they will be more than happy to answer any questions you may have.

During the question and answer period, I would ask you to approach this microphone and state your name and address and then spell your name for the stenographer.

Before we begin this evening's meeting, I would like to introduce other agency folks who have been actively involved in the Little Valley site for some years now. The Cattaraugus County Health Department, Eric Wohlers; New York State Department of Health, Cameron O'Connor; New York State DEC Region 9, Linda Ross, Marty Doster, in the back, and Dave Szymanski. And an individual with our agency who is not on the agenda that is here this evening to answer any of your questions, Michael Sivak, our risk assessor.

At this time I would like to introduce to you Joel Singerman, our section chief who will discuss and outline the Superfund process.

Joel?

MR. SINGERMAN: Several

well-publicized toxic waste disasters in the late 1970s, among them Love Canal, shocked the nation and highlighted the fact that past waste practices were not safe.

In 1980, congress responded with the creation of the Comprehensive Environmental Response, Compensation and Liability Act, more commonly known as the Superfund.

The Superfund law provides a federal fund to be used in the clean up of uncontrolled and abandoned hazardous waste sites and for responding to emergencies involving hazardous substances.

In addition, EPA was empowered to compel those parties that are responsible for these sites to pay for or to conduct the necessary response actions.

The work to remediate a site is very complex and takes place in many stages. Once a site is discovered, an inspection further identifies the hazards and contaminants. A determination is then made whether to include the site on the Superfund National Priorities List, a list of the nation's worst hazardous waste sites.

Sites are placed on the National Priorities List primarily on the basis of their scores obtained from the Hazard Ranking System, which evaluates the relative risk posed by a site.

Only sites on the National Priorities List are eligible for remedial work financed by Superfund.

The selection of a remedy for a Superfund site is based on two studies, a remedial investigation and a feasibility study.

The purpose of a remedial investigation is to determine the nature and the extent of the contamination at and emanating from the site and the associated threat to public health and the environment.

The purpose of the feasibility study is to identify and evaluate remedial alternatives to address the site's contamination problems.

Public participation is the key feature of the Superfund process. The public is invited to participate in all of the decisions that will be made at a site through the Community Relations Program.

Public meetings, such as this one, are held, as necessary, to keep the public informed about what has happened and what is planned for a site.

The public is also given an opportunity to comment on the results of the investigations and studies conducted at the site and proposed remedy.

After considering public comments on the proposed remedy, a Record of Decision is signed. A Record of Decision documents why a particular remedy was chosen.

The site then enters the remedial design phase, where the plans and specifications associated with the selected remedy are developed.

The remedial action, which begins after the design work is completed, is the actual hands-on work associated with cleaning up the site.

Following the completion of the remedial action, the site is monitored, if necessary.

Once the site no longer poses a threat to public health or the environment, it can be deleted from the Superfund National Priorities List.

Now Patricia will talk about the history of the site.

MS. PIERRE: Good evening. The site is located in the Towns of Little Valley and Salamanca, and it overlies a trichloroethylene or TEC groundwater plume, which extends approximately eight miles from the Village of Little Valley to the northern edge of Salamanca.

The site was discovered in 1982 when the county health department and the State Department of Environmental Conservation, while investigating possible TEC contamination at the Luminite Products property, found TEC in nearby private wells.

In 1989, the DEC conducted additional sampling to try to identify the source of the TEC contamination, and the county health department issued health advisories to the exposed residents.

In 1996, EPA listed the sites on its National Priorities List and conducted a focused feasibility study to evaluate possible alternatives for an alternate water supply system for effected and potentially effected private wells. The EPA also signed a Record of Decision in 1996 calling for the installation of treatment units on the individually-affected wells to ensure that drinking water standards were being met.

In addition, the EPA issued a feasibility study to identify and control the source of the TEC contamination at the site. The installation of the treatment units was completed in 1997.

Now, Rich is going to come up and give you some information on the remedial investigation and feasibility study from before.

MR. FEENEY: Thank you, Patricia. You can see the slide that's up right now. There were a number of potential source areas that we investigated. Our investigations began in 1997 and ended in 2003, the actual site investigations. There are ten areas, as we call them, and you can see up on the map, and those of you that live around here, Bush Industries, Ninth Street Landfill, Cattaraugus Cutlery, were up on the northern end. And actually, Bush Industries and Cattaraugus Cutlery were two that we focused on the most, because we had evidence that they were probably source areas. And there's a list of ten areas that we did groundwater and soil sampling on, and also the Little Valley Creek surface areas and sediment.

You will note there are a few other subareas that we also investigated, but this is the extent of our investigation of the triangle that we investigated.

Results from the investigation. We conducted fifty-nine soil samples. We investigated the sites four times for different phases of the investigation where we learned more about the sites that we needed to investigate. For example, the Railroad Avenue area was not considered early on right before we did our investigation in 2003. It came to our attention that we should evaluate Railroad Avenue because of its historical act and we did so in 2003. Of all ten areas, the TEC exceeded the New York State soil standards only at Cattaraugus Cutlery.

I say we conducted soil and groundwater samples. We collected three hundred and thirteen groundwater samples from over one hundred and twenty-five locations over that period, 1997 to 2003. We have TEC groundwater levels in the groundwater exceeding New York State's and EPA's groundwater level standards in New York State, which included in Bush Industries, Cattaraugus Cutlery and the Ninth Street Landfill areas, and to a much lesser extent in the Great Triangle and Luminite areas.

Okay. What kind of conclusions had we arrived at, based on the remedial investigation? As far as the soil goes, we concluded that the Cattaraugus Cutlery, Bush Industries areas are current localized sources of TEC groundwater contamination. And the Great Triangle, Ninth Street Landfill and Luminite areas may have been former localized sources of TEC groundwater contamination but are not considered to be any longer. Okay.

Based on the conclusions and all the other data that we generated as part of our remedial investigation, the next step in the process was to go through a feasibility study and we produced a feasibility study report, and I'm going to go through a real quick study of the remedial alternatives considered and basically determined for the soil and groundwater.

S-1, as we call it, the first remedial alternative for the soil, that's the no action remedial alternative, where we do literally nothing. It's a requirement of the Superfund process to be used as a baseline to compare to all alternatives.

The second remedial alternative for the soil, S-2, was to incorporate institutional controls where we would restrict site access to the Cattaraugus Cutlery area and otherwise not do anything.

Third remedial alternative for remediating the soil that was considered, S-3, In-situ soil vapor extraction. We would install several wells at Cattaraugus Cutlery and connect them to a vacuum system where we would draw contaminated vapors out of the ground and it would decrease the level of TEC in the soil at Cattaraugus Cutlery. And prior to that -- the extracted vapors we would treat with carbon prior to discharge into the atmosphere.

The fourth alternative we considered for remediating the soil was actually excavation of areas that exceed the

New York State standard for allowable soil concentration of TEC and dispose of it off-site, clean up and remove the contaminated soil from the site.

Then we have had corresponding or remedial alternatives again, GW-1 was the no action alternative, where we did nothing to prevent further contaminated groundwater, and again, with the case of the soil, we need to do that to compare to the other alternatives of the groundwater.

Groundwater alternative number two was site-wide monitored natural attenuation with institutional controls. Basically we knew from the period of time that we conducted the remedial investigation from 1997 to 2003, and even before that, when the state had done a lot of sampling of the EPA, the groundwater contamination had been decreasing and so we considered that -- that groundwater concentrations might continue to decrease and we would -- if we expected that to be the case, we would like to monitor the rate at which they would be decreased in the future.

Groundwater alternative number three was to actually put in wells to extract contaminated groundwater from the source areas, treat it, and then discharge it to Little Valley Creek while also incorporating institutional controls and also performing monitored natural attenuation of the downgradient plume, basically sampling the groundwater while you're treating it to ensure that contamination was decreasing at the rate you would expect them to be.

And in order to implement this remedy, number three, we would install groundwater extraction wells on both the Cattaraugus Cutlery area and the Bush Industries area, actually draw groundwater out of the ground and run it through the treatment system probably located at the Cattaraugus Cutlery and discharged to Cattaraugus Creek.

And then groundwater alternative number four that we considered was to use a different type of technology, which is called air sparging. Basically we are going to inject air into the subsurface, bubble it through the contaminated groundwater and extract that vapor from the ground with a vacuum system, treat it, it discharge it into the atmosphere. It's kind of a stripping process where we actually strip by bubbling clean air from the groundwater and extract it from the surface.

There actually is another groundwater alternative that is included in the feasibility study report, if you've had a chance to read it, or if you wanted to do so after the meeting, and as mentioned in the proposed plans, it's similar to the air sparging plan. It's groundwater number five, which is very similar to the air sparging alternative, and the proposed plan notes that but doesn't discuss it in detail. If you're interested, take a look at the feasibility study.

And remediate the groundwater at the soil and groundwater, there are a series of criteria that we use under Superfund to evaluate which should be implemented for both the soil and the groundwater. Here are nine criteria that are used to do that evaluation. The last two are happening now, state acceptance and community acceptance. The first seven are actually discussed in the feasibility report and the disclosed plan and Patricia is going to recommend the remedial alternative that the state has agreed to for both the groundwater and the soil based on a balancing judgement on how any of the alternatives satisfy these criteria.

Cost is one of the more important criteria that we look at. Here you see the comparison of the cost to implement the four soil remedial alternatives that I talked about before. Remember S-1 is the no action alternative that we do nothing. It costs nothing. S-2 is institutional controls. S-3 is soil vapor extraction, where we're going to extract vapor from the soil and, over time, reduce the concentration of TEC in the soil.

And S-4 is the excavation of contaminated soil and replace it with clean soil.

And then we have your four groundwater alternatives. GW-1 is no action alternative. It doesn't cost anything to implement. GW-2 is the monitor natural attenuation institutional controls. GW-3 is the extracting the groundwater, treating it in a treatment system and discharging it to Little Valley Creek. GW-4 is the air sparging, where we inject air into the groundwater and bubble all the contaminates and collect them into vapor.

I'm going to turn it over to Patricia and she'll explain to you the recommended remedy.

MS. PIERRE: EPA's preferred soil remedy is, I believe, alternative S-4?

MR. FEENEY: Correct.

MS. PIERRE: And that's excavation and off-site disposal, which involves excavating approximately two hundred cubic yards of contaminated soil from the Cattaraugus County area, backfilling the excavated area with cleanup fill and disposing of contaminated soil at an EPA-approved facility.

EPA's preferred groundwater remedy is monitor natural attenuation with institutional controls, and as Rich said, this would involve periodic sampling of selected groundwater wells to monitor the levels of TEC at the site to ensure that they are continuing to decline.

EPA also intends to conduct a vapor and intrusion study, and the purpose of this study is to determine whether or not TEC vapors from the groundwater are getting into the homes at the site, if they're affecting the indoor areas of the site. So that's something that EPA would also conduct at the site as part of it.

Joel? Before we open the floor up for questions, Joel has a few more comments.

MR. SINGERMAN: The

preferred remedy that Patricia just described, it's just that, EPA-preferred remedy. We wouldn't make a final decision until after the close of the public time period and we hear all the various comments tonight and written comments.

And in terms of the schedule, the period ends July 26th, we hope to select a remedy sometime in maybe early to mid August, and we are also on a very ambitious schedule, we hope to start construction very shortly thereafter. The bottom line is, we hope to wrap up the construction site. So at this point, we will entertain questions or comments.

MR. BASILE: What I'd like to do is ask Richard and Pat and Joel to come forward, and if you have questions, once again, I'm going to ask if you wouldn't mind approaching that microphone one at a time, identify yourself by name and address and spell your name for the stenographer. And we'll pass the microphone among the three of them. I think the three of you are going to have to come over here. Any questions?

AUDIENCE MEMBER: I'll start it off. James Haley, H-A-L-E-Y. I can say my question is, when is the last time it's been tested? My property has two sampling spots on it, one on the north and south side of it, and I haven't seen anybody in at least two years on the testing of it. So how do we know where we're at, or do you just focus on the three areas that we're talking they're on testing the water?

MR. FEENEY: What's the name of your property?

AUDIENCE MEMBER: Haley.

MS. PIERRE: It's not one of the ten on the list?

AUDIENCE MEMBER: No. But both ends of my property you put in two wells to test and I haven't seen anybody, like I say, in two years. So how do we know where we're at on the contamination end of it? I'm right across the street from Luminite, so that's my concern, you know.

MS. PIERRE: The last time we went out to sample Luminite was in 1998.

AUDIENCE MEMBER: 1998.

MS. PIERRE: That would be the Luminite property.

AUDIENCE MEMBER: I'm right across the street and you'll throw a stone and hit my property.

MS. PIERRE: The purpose of the remedial investigation was to gather information and try to identify a source, so that's what we've been doing. Do you have a residential well?

AUDIENCE MEMBER: Yes.

MS. PIERRE: And do you have a system on your well?

AUDIENCE MEMBER: Half a system. There was a whole system put in there and you came in and took out half of the system. All I have now is the two vapor tubes with the blue light.

MS. PIERRE: Initially

you had an air vapor and a carbon unit, a polishing unit, we since then went in and replaced the air stripper with another carbon unit. So it is a complete system. These two units work in series. So you do have a complete system and those wells are tested on a regular basis, once a year.

AUDIENCE MEMBER: Okay.

MS. PIERRE: So the last time would have been October of last year.

AUDIENCE MEMBER: All right. What was the results of that, do you know?

MS. PIERRE: I don't know the results of your specific property, but my understanding is that those results are sent to the residents. Is that right, Mike?

AUDIENCE MEMBER: No.

MS. PIERRE: Anybody from the state?

AUDIENCE MEMBER: Patricia, if Cameron is with the state health department, if he can get your name and address tonight, we'll make sure those results are sent right to you.

They will come from the state health department.

AUDIENCE MEMBER: I'm sure that's a concern all the way down the valley here. That's why there's only a few of us here and I don't understand why there's only a few. We all have concerns down through here. I have two young children to think about and Luminite is across the street and I didn't receive any.

AUDIENCE MEMBER: Marty, we do not send the results to Little Valley. That has always been done by other agencies. I'm sure we can get the results to the homeowners. But typically, when the state health department and the county health department were doing the sampling, the counties got the analyses and sent them out. When EPA took over the project, they took the samplings and I'm not quite sure who was responsible to get the actual reports to the homeowners out, by we were not.

AUDIENCE MEMBER: We'll make sure that gets done.

AUDIENCE MEMBER: Yes.

AUDIENCE MEMBER: I guess the only other follow-up is, who is responsible for the funding of everything that's going on? Is that a --

MR. SINGERMAN: Well, at this point, since there really aren't many viable parties out there and if we can't find anyone to do the work, that the Superfund would finance it.

AUDIENCE MEMBER: Well, what about the places that are contaminated the most, the ones that are listed all the time?

MR. SINGERMAN: Well, the Cattaraugus County area, that property, I believe, was contaminated by the predecessor in the industry that was there. The current owners, we don't believe, were responsible for that, so the Superfund would pay for that. And the estimated cost is a hundred and thirty-six thousand for remedy. The national groundwater, that would cover at that location and other locations would be funded -- most of it would probably be funded by Superfund. There is no

-- Bush Industries is an active operation, so we would likely enter into negotiations with them to see if they would be interested in doing any of the investigation.

So the bottom line is, we do have money earmarked for the excavation work in the Cattaraugus property. We have currently money earmarked for that to do that work this summer.

AUDIENCE MEMBER: Okay. Thank you.

AUDIENCE MEMBER: I'm Diane Yonker, Y-O-N-K-E-R, and I live at 4116 Center Street in Salamanca. I'm one of those people that are down real close to the City of Salamanca boarder. I guess I just want to know that you found TEC in private wells in 1982 and in 1996 something was decided, that's when some sort of treatment wells were installed, that's fourteen years. I've lived in my property since 1970, so I've been there thirty-five years. So for thirty-five years has my family and my children been drinking contaminated water without knowing it? Probably. I'm curious as to what the health effects are.

MR. SINGERMAN: We have a risk assessor.

MIKE SIVAK: I'm Mike Sivak and I'm an EPA toxicologist and risk assessor who is working on the project with the rest of the team. Your question was, if I understand it correctly, when the site was originally discovered, when TEC contamination was originally discovered in 1982, that state health department and the state DEC then started to notify individual property owners?

AUDIENCE MEMBER: I don't believe we were ever properly notified.

MIKE SIVAK: As they started to discover how far reaching the problem was, more and more people were notified and they were found to contain these contaminates above safe drinking levels. They take some time --

AUDIENCE MEMBER: Fourteen years.

MIKE SIVAK: Not necessarily fourteen years. It was fourteen years from the time of discovery until the site was listed on the National Priorities List. It wasn't fourteen years from the time TEC was discovered in private wells until they went out to private wells saying those wells were affected.

As -- whenever those instances happened, whenever unfortunately it's found that private wells are contaminated, all the agencies that are here tonight, whether it's the federal EPA or state health department or DEC, acts immediately to ensure that public health is protected and people are not drinking water that is contaminated above these levels. So although we have these very large lapses in time, from the time the site was discovered, all the time was listed on the APL. And then from the time it was on the APL in '96 until tonight, there's a lot of activity that's been happening.

Throughout that whole time

there has not been exposure, ongoing exposure for anyone drinking the water to levels of these contaminates that are above the federal and state drinking level standards. And that's very very important for everyone in this room to understand.

As soon as any private well was found to have TEC above those federal or state MCLs, the safe drinking level wells, the property owner was notified and then one of these POUT systems was put in place, and Patricia described what the systems were to the other gentleman.

AUDIENCE MEMBER: We have that in our home, obviously, so we must have been one of those places, but we didn't have it installed until 1996.

MIKE SIVAK: That may have been when the contamination was discovered at your property. You can see that there are many areas along that whole eight-mile long stretch where we did some investigation where we thought there might have been historically sources to this groundwater site. The groundwater does move relatively slowly, so just because the source area may have been a little bit further -- a little bit further upstream than where you live, it may have taken that long for it to reach --

AUDIENCE MEMBER: When you say groundwater, are you saying wells?

MIKE SIVAK: Yes, the water under the ground that feeds the private wells.

AUDIENCE MEMBER: Okay. My next question is, I certainly think you're taking an aggressive approach on the soil contamination when you go with the S-4, it sounds like that's a viable solution, but I don't necessarily agree with the groundwater solution. It's a very laissez-faire thing. You're just sitting back and looking at it, monitoring it, and I don't know that personally I agree with that. I believe we should be taking a more aggressive approach.

We're looking at human lives

here, and if there's any kind of health hazard, personally, I believe we should be looking at the three or four stage. I know you're looking at money, but what price do we put on money when you're talking about human lives and our properties and our drinking water? You bathe in it, you cook in it and you're talking about now -- I always wondered about that, when they say they said this thing, this great big plastic pipe that goes out and pumping all of the TEC out of my system and into the air, well, that's the air that we're breathing and that's in my home, so what is that doing to our -- the air that we're breathing in the environment?

MR. SINGERMAN: No one is drinking contaminated water. Everyone that has a contaminated well, the POUT systems were installed, we installed approximately ninety treatment systems in '97.

AUDIENCE MEMBER: But we probably drank contaminated water, I don't know at what point that happened, but I've lived in that house since 1970 and nothing was done until '97.

MR. SINGERMAN: Okay.

AUDIENCE MEMBER: So -- and that's not your fault. I realize you didn't contaminate it.

MR. SINGERMAN: We can't speak for prior actions, but basically as soon as the site was listed on the National Priorities List, we did a feasibility study, and very shortly thereafter we were out there putting the systems in. So it was a matter of I think approximately a year, the same year that we installed treating systems.

So in regard to the remedy you're talking about, you know, the ones we're selecting or proposing is, basically, first of all, it's recognizing the fact that no one is drinking contaminated water and also we're looking at the data over the years and we see there's a downward trend. And there is, you know, one existing contaminated soil search that we believe has to be removed. But overall, the average concentrations have diminished significantly. And I think the average concentration is five point nine parts per billion, years ago is was significantly greater than that. The maximum concentration is twenty-two parts per billion when the parts years ago were fifty, so we're seeing a downward trend.

AUDIENCE MEMBER: What's the acceptable level?

MR. SINGERMAN: Well, the drinking water standard is five.

AUDIENCE MEMBER: We're almost a point over.

MR. SINGERMAN: There's quite a number of wells, I don't know the exact number, at least half the wells contaminated in the past have reached that standard, and a large portion of ones that have not are marginally above it, between six and ten. There's only, I believe, a dozen or so wells between ten and twenty-two. So the vast majority of the wells are either at the drinking water standard or close to it. And we're talking about an eight-mile plume.

We have much higher contamination at the Cattaraugus Cutlery property and the Bush Industries property, but again, considering that, you know, the fact that really no one is being exposed to groundwater. The fact that it's attenuating naturally by itself and natural processes that occur, that we've estimated in about ten years that the groundwater will achieve three quarter standards. That's in conjunction with the removal to the Cattaraugus property.

The cost is one of the factors, not most important. Protection of the public health is most important, and complying with the regulations is the other most important one. Those are to be met before. If they don't -- if an alternative doesn't meet those, then we cannot even consider it any further.

So we believe that attenuation is allowing the groundwater to naturally continue through its natural processes and observing it and monitoring it and making sure it's continuing to do that is an appropriate remedy.

The thing is, if the levels would happen to go up, we would consider another approach. We do have what we call a five-year review. We re-evaluate the remedy to make sure it's doing what's it's intended, and if not, then we have the option of modifying or doing something to further protect the public health, if necessary. We don't feel that's the case.

AUDIENCE MEMBER: Don't you think five years is a little bit too long, I mean, to monitor it?

MR. SINGERMAN: We will be monitoring it on a routine basis, maybe once a year. Every five years we will assess where we are and determine whether or not we need to do anything further. It's not to say we're going to be sampling once every five years. We will be sampling on an ongoing basis over the years. We're in the process of evolving a plan and I think take samplings once a year.

MS. PIERRE: Yes.

MR. SINGERMAN: And based upon that, we hope to continue to see a downward trend. And as I said, in ten years we expect the groundwater to reach the drinking water standard.

MIKE SIVAK: I just want to clarify. Joel cleared it up at the end. We will be sampling the groundwater at these monitoring wells on a regular basis. Right now we're thinking on a yearly basis, which is the same frequency we're sampling the treatment systems that are in place. That's proven very effective for us to do it on a yearly basis and that's what we're thinking of doing here.

When those data come back, when we analyze the monitoring wells, we're going to be looking at that. We're going to see if we're continuing to see downward trends or maybe something happened, for whatever reason, and the concentrations start to go up. This five-year review that Joel talked about, that's more of a formal review. We're going to look at the data every year. Under the Superfund law we have to summarize everything and report after five years, and they're big on reports, and we have to summarize them in a report and look at the whole remedy and look at what we have and write everything up as kind of the state of the system that's in place. We will be reviewing everything that comes in and providing recommendations to Patricia and Joel, the project manager and section chief, and is everything performing the way we expect it to perform.

But it's every five years that we take that evaluation a step further and do a comprehensive evaluation of what happens over the next five years.

Does that make sense to you a little bit?

AUDIENCE MEMBER: Yes. We do have our wells sampled once a year, but I never any results back and I've always assumed that that was a good thing. But still in all, it would be kind of encouraging and ensuring to us if we could receive something back to state what the level of the well is. Thank you.

MR. SINGERMAN: Just one thing to note. You should be receiving results. I guess, you know, we'll make sure that that at least happens.

AUDIENCE MEMBER: But the thing is, the sampling the -- I guess it's conducted to make sure that the treatment system is functioning properly, so the fact that if there was a problem that they would fix it. The bottom line is, you're not drinking contaminated water, the treatment system is working properly. What is being sampled is checking the water before treatment and after treatment to make sure that the end result is fine and also for us to gauge what's going on in the groundwater.

So you don't have to worry that you're being exposed to contaminated water, because you're not, based on the sampling done that we've been receiving.

AUDIENCE MEMBER: Joel, I'd like to address your initial question a little further about the time frame. There's two important points I'd like to make. Yes, the first contamination was first discovered is that routine water sampling at the well at the Luminite property, and then over the course of the next couple years there was dozens and dozens of additional samples taken to identify the extent of the contamination in the groundwater. And it took a couple years to establish that it basically extended all the way from Little Valley to Salamanca.

And at that time the legal drinking water standard or TEC was fifty, so even though the contamination was discovered, legally, that wasn't considered a health risk, because the legal standard was fifty. It wasn't until 1989 or '90, that's what I just asked Cameron, that the legal standard to TEC in drinking water was lowered to five. Once that happened, so then it wasn't until 1989 or 1990 that the official request went to DEC to investigate the source of the contamination, then it was considered a health risk and a possible hazardous waste site.

And of course, then DEC spent lots of money doing an investigation. I remember when the drill rigs came out and they were punching holes all over the community to find out where the TEC was coming from, and of course the sampling tubes and their study took years. And it was ultimately determined that they couldn't identify a single primary source where this was coming from. And I think there was an issue, I think, with the legal definition in the state Superfund law, you can correct me, it wasn't until, whatever it was, 1996?

MR. BASILE: '96.

AUDIENCE MEMBER: Then the DEC referred it to EPA and was successful in getting it on the National Priorities List. There was a lapse between '82 and '89, because the standard was still at fifty. So things changed in 1990. But there was been -- there's been millions of dollars spent studying this by the DEC and the EPA.

Ultimately, once the standard was dropped from fifty to five, that's when all the notices went out to all the residents, hey, there's a possible health risk associated with this and you shouldn't be drinking it without treatment.

AUDIENCE MEMBER: I've got one quick thing to add there, if you don't mind me interrupting. You did an excellent job on her questions, other than the fact that nobody answered whether there's been any issues of sickness with anybody. That was kind of skipped over.

AUDIENCE MEMBER: Our office has never been contacted by anybody's physicians.

AUDIENCE MEMBER: Nobody's office has?

AUDIENCE MEMBER: No.

AUDIENCE MEMBER: I think that was one of her questions that wasn't answered.

AUDIENCE MEMBER: It was interesting, you know, what health hazard is there.

AUDIENCE MEMBER: Fifty to five is quite a drop.

AUDIENCE MEMBER: Relatively speaking, these levels are very low.

AUDIENCE MEMBER: That's good for you.

MR. BASILE: Yes, sir.

AUDIENCE MEMBER: Dennis Sibley, S-I-B-L-E-Y, 5343 Windship Circle. About eight or nine or ten years ago, we sat in this same auditorium and discussed alternatives and at that time one of the alternatives -- I'll back up. The statement was made if the source was not found and contaminates was not removed, and I believe it was five years, that the alternative would be to install water mains from Little Valley to Salamanca. The point source obviously has not been found, other than the four hundred yards that you're going to remove. I guess my question is, why is an alternative of a water main not on the list now?

MR. SINGERMAN: Well, back in '96 when we looked at alternatives, we looked at using treatment systems and village treatment systems and also waterlines and we also decided the use of treatment system was appropriate. We also decided at the time in five years to reassess the situation to see whether or not a waterline would be appropriate. That occurred -- it's 2002, five years later.

We basically made a determination that at this time that it appeared that the treatment system was still working and continued with that. We decided to go to carbon units, because the levels had gone down, but we basically said we would defer the ultimate decision regarding a waterline, until we made a decision regarding this particular remedy for the source control.

So at this point, we've looked at the levels that we have and the estimated time frames and cost and I believe the cost was somewhere in the neighborhood of three and a half million dollars. And based upon the fact that the levels of contamination were going down and we really didn't think it was really appropriate to put a waterline in, because, you know, a waterline is really only appropriate if we have to put a treatment system on for a long period of time.

Again, we estimate in ten years the treatment systems can be removed, because we reached the three water standard. That's basically the logic behind that. We don't think it's appropriate to put a waterline in primarily because of the fact the levels are going down and the average concentration is five point nine and the maximum concentration is twenty-two. If the levels were going up, perhaps we would consider it, but really these levels we have at present don't justify it.

AUDIENCE MEMBER: It's a judgment call when it hits five for the MCL and that's the point where we don't worry about it anymore? When Eric said the MCL was at fifty parts per billion, to correct that, there was no standard in private water supplies, so it doesn't matter if it was five, fifty, a hundred in the water supplies from here to Salamanca, there was no standard in private water, only public water. When it was to five, that was a pretty routine drop across the board, not just TEC, but other things.

The fact remains, it's a chemical that's in the water that shouldn't be there. You can say when it gets down below five, that's okay, but it's not supposed to be in water. So to say that at four or four and a half or four point nine, it's okay, drink it the rest of your life versus putting in a water main, which would ensure that it not be there -- and I did a lot of the sampling when this first started in 1984. I sampled everybody from one end to the other, because I worked for the health department for twenty-four years, and yes, there were some higher levels than there are now.

I take exception to the fact that they're not reporting the levels. I just happen to live there. I lived there for probably ten years before we discovered TEC in the water. But now we get a letter that says the level has reduced. It doesn't mention anything about levels. I took enough sampling to know that in some places it was twenty-two and other ones it was four and the next time it was twelve and sixteen, and they varied up and down, up and down. So to say it was okay because it's four in my neighbor and six down the road and it's two in mine, well, what's it going to be tomorrow? It moves through in chunks. It's not a constant thing. This wasn't introduced there in parts per million, this was introduced in barrels and it goes through in higher and lower levels.

I just -- I guess I've said all along, and I like the job that you're doing, I'm thrilled that somebody put an air stripper in my house and eventually charcoal filters. Either one works. Actually, I put my own charcoal filters in seven or eight years before the EPA came in and put the air strippers, because we knew it was there and it was the best thing I could do and I did.

But the fact remains, I've got to say it again, it's a chemical that's foreign to the water. It shouldn't be there at any level. I don't care whether it's green dye or TEC or orange juice, it isn't supposed to be in the water supply. And whatever you can do to remove any -- whether anybody has been ill because of this, I have no idea.

I remember doing studies out through the Town of Otto where we had complaints of strips of roads of people that had cancer and we did studies up and down and there were twenty different kinds of cancer and some were environmental and some were hereditary, so you can't say yes, somebody got cancer from drinking water. I know it will never be proven that they did. But also, again, it's not supposed to be there.

MR. SINGERMAN: Again, the

standards are selected for drinking water, whether public or private water. Just because it's a public water supply, doesn't mean it's non-detected in public water supply as well.

AUDIENCE MEMBER: The same standard applies for public water. There could be potential contaminants in other public water that could meet the standard and still be present. There's no way to get pristine water anywhere. There's natural background amounts, that we put quotation marks around. So putting in a public water supply doesn't mean we have pristine water. As long as it complies to the standard, that's acceptable.

AUDIENCE MEMBER: The Village of Little Valley water supply is on Tenth Street at the north end of the village and there is zero TEC in the water. Zero. And on this end of the village, I've seen two hundred and forty-seven parts at Bush Brothers. I remember -- I can remember when it was hundreds when they pulled it out of the wells. So it's somewhere between the north end of the village and it's picking it up in the village or between here and Salamanca.

MR. SINGERMAN: The bottom line is, we believe that -- overall, it's a downward trend, some may go up and some may go down. Overall the level is going down and, you know, the best we can do at this point is strive for the drinking water standard, which is -- which is a regulatory value, which is deemed to be protective of the public health.

AUDIENCE MEMBER: Don't get me wrong, I'm pleased that there's a treatment system in my house and I do trust the results that they're getting that they are lessening, but I think it would be good to see results and see actually what Cameron does do. We used to get reports and it would be nice to see -- I can remember when mine was fifteen and sixteen and it went to twelve. And I was pleased that it was going down, and now I get a letter that says it's less than it used to be.

MR. SINGERMAN: Well, the homeowner should be receiving results from the wells, so we'll have to find out why it's not happening and make sure it does.

AUDIENCE MEMBER: Thank you very much.

AUDIENCE MEMBER: Harriet Schauman, S-C-H-A-U-M-A-N. I'm on 8224 Route 242, Little Valley. Just for clarification, maybe it's in here, but I have not read the thing, because it's just too complicated to read. What is the Superfund site? What's that mean?

MR. SINGERMAN: The site is defined as -- well, normally a site is defined as the source of contamination and the extent where the contamination migrated to. Here it's backwards. The site is defined as basically wherever there was groundwater contamination and we included whatever source water we identified. Basically, all the whole area along Route 353 is the site. Anywhere we have contaminated groundwater or soil, Cattaraugus Cutlery is the site and Bush Industries and plus all the other areas that were listed and the whole plume, which includes the wells that are impacted.

AUDIENCE MEMBER: Okay. It's still very difficult to understand you, because I guess you talk too fast. I was sitting over here and when I'm standing here, I can hear you better, but when you're there, I can't. The other question is, please explain to me what present cost -- present worth cost on these different alternatives mean.

MR. SINGERMAN: Okay. Present worth cost is basically a calculation to determine what the present value of money would be over a period of time. So like, for example, if over a ten-year period, if you invested money at seven percent interest, how much money would you have to invest so you would have enough to cover over the period of the life of the project. Generally, operation maintenance operations are an annual cost, and I think the annual cost was thirty-seven thousand dollars. So that, calculated over ten years, gives you the present worth cost. It's basically the capital cost, whichever cost of construction or anything related to construction activities plus the annual cost over the life of the project. That's what present.

MIKE SIVAK: Is that clear?

AUDIENCE MEMBER: It's clear, but you're still speaking too fast.

MR. SINGERMAN: Sorry.

AUDIENCE MEMBER: He is.

AUDIENCE MEMBER: Merle Burger, B-U-R-G-E-R, 5444 Route 353. Myself, I don't believe that you are monitoring the wells sufficiently. I would think it would be more appropriate to at least monitor the homes on a quarterly basis and you're monitoring wells at least once a month, because our water table changes drastically. It's changed six feet within the last three weeks here. So we're certainly going to get surges from that. And I just think you'd keep a better track of it. We would know where the hot spots are. We can identify more appropriately, to do it and say everything is fine, we can all pick a date once a year and get a good result.

MR. SINGERMAN: We're not trying to get good results, we're trying to get a snapshot in time of what we see there. Even if we were to sample on a quarterly basis, really what would the value of that information be? By sampling annually, we're seeing a downward trend. So sampling four times a year would complete the same thing, we're seeing a downward trend, but we would have three more pieces of data a year.

Also there's a manpower, you know, matter related to that as well. We're talking about sampling quite a number of wells and it costs a lot of money, so there's only limited funding, and we try to get the most bank for the buck for the most money we have. So really we believe that the sampling program we have now is protective.

And first of all, the individual wells are protected, they have treatment systems on them. Regardless of whether we sample or not, there's system protection. It's a sampling once a year to make sure that the treatment system is working properly.

MS. PIERRE: And sampling at the same time each year.

MR. SINGERMAN: Yes. It's an annual event. Usually in October.

MIKE SIVAK: Can I add something to that? I think one of your concerns was, sir, was that if there's sort of a surge of contamination that may go through at a certain time, but only sampling once a year, are we potentially missing that? Is that part of your concern?

AUDIENCE MEMBER: I think any time out of a day or week, the way this water table fluctuates and that, we're going to have higher concentration at different times, at different places, from different sources.

MIKE SIVAK: And I think what's important to remember that the water that you're drinking is being treated through those filters or through those units, through those points of treatment systems. Even if there's a surge of something coming in, that water is still being treated before it goes to your home and that's, I think, what we all need to focus on here.

In homes that we identified there is a problem, whether there's a surge that comes through or not, it's -- that water is being treated before you drink it and the treatment in place has the capacity to treat a surge that would come through.

AUDIENCE MEMBER: Okay. But have you established in this eight-mile stretch, is there a pool in different places of that contamination or are we all assuming it's coming from Cattaraugus Cutlery and Bush Brothers? Those are the basic sites and it just continues to filter down the valley? Is it pooled someplace else?

MR. SINGERMAN: Those are the only two sites that we identified as current sources. We identified an additional three sites that were probably prior sources in which the levels are low, you don't -- I mean, there may have been other sources. The problem is over time all the contamination gets flushed out as a result of rain. To be such a long plume, there may be other sources, but we can only identify the two we identified, and it's not likely that these two locations are the primary -- are the sole source of the whole contamination for eight miles. There may have been some other sources, but the ones we identified were the only ones we could identify based on the data now.

We can't look at the past and see what we had. We can only look at soil samples we collect now and groundwater samples we collect now. You can't hypothesize what happened then. If there's a sample fifteen or twenty years ago and the TEC is long washed out, there's no way to say it was really a source.

AUDIENCE MEMBER: I've noted

from several of the comments that people aren't comfortable because they're not seeing the data. As Cameron mentioned, early on when we were using the state laboratory to do all the testing, then letters always went to the homeowners and you knew what your results were. It sounds like there's a problem. And the EPA is contracting with a company to do the testing, you get the data from the company, but it sounds like the data is not going to the homeowners. I'm sure -- they can plot all of your data over fifteen years and what they're saying is, yeah, there may be a little fluctuation up and down and the general trend is decreasing, and I think it was probably satisfactory to their need to, if they could see that data.

So I don't know if that was part of your agreement with the contractor to send out results or if that just may be something that your office needs to compile and get out. I don't know there were like ninety homes, weren't there, that have the treatment units? So it would be a chore to pull all that data together.

MR. SINGERMAN: Well, you people don't want to see all the start-up data, just current data.

AUDIENCE MEMBER: We want to know where the water is at. We have Mr. Sibley here that says the water up the road here is zero and we're seeing that it's drinkable after it goes through these filtration systems in our home. How do we know it's drinkable? Do you understand? Is that taking everything out of our water, so once it goes through these filters in your basement, is there zero there, zero contaminants? How many wages are being paid compared to running a waterline down through here for the next ten years or the past fifteen years? I'm sure that was all determined. But where are we at financially, as far as having no contamination in our water? There must be something to it, if Mr. Sibley said --

AUDIENCE MEMBER: I think the

charcoal is taking it out. I don't think the charcoal is removing it up to the point of the -- I think it's down to zero.

AUDIENCE MEMBER: Once it comes through our filters, it's zero?

AUDIENCE MEMBER: Yes, and then non-detectable.

MIKE SIVAK: I'm sorry, I need to interrupt. We keep running around this number of zero and that's a bad number to throw around. We can never detect zero. For any chemical out there, we can never detect zero. We don't have the instrumentation or capabilities to detect zero. Zero could be point zero zero zero zero zero point one. There's always another decimal place that can be entered in and that's very very bad for any of us in this room to think. We have to keep thinking in terms of detection limits, because different chemicals have different detection limits.

We can detect different amounts in different chemicals based on the properties and analytical methods that exist that the labs can use to test drinking water, but you will never see a lab report that says zero. You will see non-detect, you will see less than a amount, but you will never see zero. And that's okay, that's absolutely okay. I think it's very self-defeating to think unless I see zero, then I'm not going to be satisfied. Because we can't get zero for any chemical that's out there.

So I think that this is kind of like a big thing for me, because this is part of my job to say these levels are protective of public health, and when I say things to my project managers or Joel or to you guys here tonight, you will never hear me use the words zero is the only good amount. You will never hear me say that. We think less than a protection limit or non-detectable concentration or concentrations below drinking water standards, those are the goals we are trying to reach. Thank you.

MR. SINGERMAN: Anymore

questions?

AUDIENCE MEMBER: Was it determined about the waterline, I guess, you know, and the cost between the two?

MR. SINGERMAN: You mean whether or not we would implement it or not?

AUDIENCE MEMBER: It's been this long now since everything has happened.

MR. SINGERMAN: In the proposed plan there's an analysis where we presented the fact that we decided that we believe it's appropriate to continue with the treatment systems rather than putting the waterline in, because of the cost, which I said it about three and a half million dollars, and the fact that the levels are going down and the fact that in ten years we expect the drinking water standards to be obtained and we really didn't -- it didn't make a lot of sense to put a waterline in for those reasons.

I guess I wanted to say one thing that Michael said. Air stripping and air absorption technologies are very effective in removing volatile contaminates, which TEC is one. I have sites that use active carbons to remove TEC or other carbons like that, unless the carbon is spent, in other words, come to the end of its usable life.

AUDIENCE MEMBER: We almost always say to the level of non-detectable that Michael talks about. It's not always effective. I know you feel better if you had actual numbers and I understand that you are going to get the numbers. I think you can be reassured in knowing that this particular contaminant is really easy to treat by these technologies and other technologies.

AUDIENCE MEMBER: Norman Marsh, M-A-R-S-H, 121 First Street, Little Valley. I guess I got a question. If you want to do the S-4 site and remove the soil and everything and replace it with new soil, and I know it's probably hard to answer, but what percentage of reduction in the TEC do you assume that we would reach over a period of years, do you think, without doing anything with the Bush site? Do you think these people would ever be able to get off the air filters and carbon filters and stuff?

MR. SINGERMAN: Yes. We believe that by removing the soil contamination of the property, that's a source -- one of the sources of the contamination that we identified. Within ten years, all of the affected wells will have reached drinking water standards and the treatment systems can be removed at that time.

AUDIENCE MEMBER: That's without doing anything with the Bush site?

MR. SINGERMAN: The Bush site we have basically seen no migration of contamination off-site. The wells just off the property are at acceptable levels. We don't see today migration off site. We believe in the past it was a source, but we don't presently. It's not a source.

AUDIENCE MEMBER: So you're mostly concerned with just the Cattaraugus Cutlery site, then?

MR. SINGERMAN: We're concerned about all, but we believe that moving the source of Cattaraugus Cutlery area and allowing the natural process to continue, the ground will reach the standard in ten years. So the levels of groundwater contamination at the Bush Industry standards are not acceptable at the present, but over time that would attenuate to acceptable levels in the groundwater.

AUDIENCE MEMBER: And that's the same thing with the groundwater, it would reach non-detectable levels --

MR. SINGERMAN: Well, initially it will reach the five parts per billion, which is the drinking water standard. Eventually it would reach non-detect.

AUDIENCE MEMBER: But that would be over a long period of years? It may be never?

MR. SINGERMAN: We don't -- we didn't really calculate how long it would take from five down to non-detect, but, you know, I mean, I presume we can determine -- basically it's a mathematical calculation, you can, based upon various factors, you can calculate what the concentration would be over a period. We didn't do a calculation, but as I said, five parts per billion is a drinking water standard and it's a health-based level. It's not an arbitrary number picked out of the air. There's a scientific basis for the number.

AUDIENCE MEMBER: If the federal government wanted to ante up money, we would be more than interested, the village, to drill another couple wells and put in a pump station and run the waterlines clear to Salamanca, if they wanted to, with the federal government's full cooperation.

MR. SINGERMAN: Well, as I said, we really didn't think it was necessary to put a waterline in. The fact that the levels are going down and the fact that in ten years it will reach the drinking water standard, that really, the water line is not really appropriate.

AUDIENCE MEMBER: Like I said, there's been no records of anybody getting sick or anything from any of this contamination so far, or not that anybody knows of, but just from listening to some of the people talk, I think they'd feel a lot better with a waterline from the village running down through. It sounds like they'd feel a lot safer than carbon filters. But I think that's just psychological.

MR. SINGERMAN: You have two carbon fillers. It's a two-step process. So the thing is, it's basically a double treatment. So like I said, the levels of contamination that are occurring is non-detect in what's coming out of the tap after treatment.

AUDIENCE MEMBER: I don't recall anyplace in the report where it really explained to these people what natural attenuation is and I don't know maybe, Rich, if you want to take two minutes, because it's in the presence that everybody might not understand that there are natural processes that can break down this chemical in nature. I don't know if that would be helpful for people to understand a little better what you're proposing as a groundwater alternative in monitoring natural attenuation.

MR. SINGERMAN: Basically it's three Ds, dilution, dispersion and degradation. Dilution is basically you have certain concentrations, for example, imagine dropping a dye into a swimming pool, you initially drop it and it's a red dye, at the point of impact it would be red, and over time, eventually it would start dissipating and be pink in some areas and eventually you won't see anything. That's dilution. Basically moving -- it's being mixed up with a clean water.

Dispersion is basically the same situation, you drop the dye in and it eventually will spread out over the entire pool. It's basically -- it's not basically staying in one spot. It's moving out and being dispersed over the whole process.

And the last process is degradation. Where you have natural microbes in the soil that I would use as a food process, and they convert it into other -- other compounds, which eventually become carbon dioxide and water.

In a nutshell, that's basically what the natural attenuation process is. Natural processes that causes contamination to go from initial concentration where it starts out to much lesser concentrations as it moves away from the site.

MR. FEENEY: Just to add to what Joel said, again, I don't know if you've had a chance to read the feasibility study. It's a big book and maybe intimidating and there's big numbers and small numbers that may be hard to comprehend. We didn't come to the conclusion that natural attenuation is a viable remedy. We evaluated it. We picked nineteen wells out of the valley. EPA has a very detailed procedure to follow to go and sample the wells, which we did in 2003, and analyze with a complex analysis that we do, not chemical, we do physical, oxygen, hydrogen, ph, things like that, and they're all part of an analysis and scoring system that has developed that we went through to determine, number one, that natural attenuation is already happening, and number two, is it happening at the rate that we would like to happen, and going forward, is this a viable remedy for the site. I invite you to read the report. It's not too complicated but it explains in more detail what Joel explained in summary, and we are sure that natural attenuation is a viable remedy for the site.

AUDIENCE MEMBER: And that report it available at the two repositories.

MR. FEENEY: It's appendix C or D. There's a lot of pages in there about the complicated sampling and analogies and the wells that are sampled and why we picked them and the plume downgrading and things like that, and the scoring that determined that natural attenuation was occurring and could expect to be occurring in the future at a rate that we would like it to.

AUDIENCE MEMBER: My name is Bob Milks, M-I-L-K-S, 5035 Route 353, Salamanca. My question is more to the remediation of the soil. Not because I want to argue it, I was just curious. You intend to take out so many cubic yards of soil -- and forgive me, I didn't read the whole thing -- are you going to test periodically when you take the soil away until you get down to a certain level and what is that level?

MR. SINGERMAN: The level that we're using there's a state level which is seven hundred micrograms per kilogram, which is basically seven hundred -- again, I can't really explain what it is, but basically, that's the concentration. At the Cattaraugus Cutlery, just as a point of comparison, right now we have seventy-two thousand parts -- micrograms. As we excavate -- and basically we estimate four or five feet and two to three hundred yards in cubic areas. After we excavate down, until we reach the bottom, we'll take samples from the bottom and the sides to make sure we have got it all. If we haven't, then we continue to dig.

AUDIENCE MEMBER: Thank you. That's my question.

MR. SINGERMAN: Anymore questions?

AUDIENCE MEMBER: My name is Jane Sibley, and I live at 5343 Windship Circle. And it seems there is an attenuation with the information that we get from the folks that are collecting the data. And it does seem like we -- if we could have the information, I think it would help to clarify a lot of things and maybe put our minds at ease.

But back to the health situation. Wasn't there a survey that was done a few years back of what health concerns people had, maybe what their health issues were?

MIKE SIVAK: Was that the state's VOC registry, the Department of

Health's VOC registry?

AUDIENCE MEMBER: She probably wouldn't know.

MIKE SIVAK: You're from the Department of Health.

AUDIENCE MEMBER: I would have to check. There was something in our health consultation where we -- the New York State Health Department did a health consultation and that was one of the reasons why EPA was able to come in and do what they did. One of our recommendations was we had -- there's a registry that goes on out of our central office and it's relatively exposures to volatile organic chemicals. That was quite a few years ago, but I will check into it to see what was done, because that would have been handled through the Troy office. So I can -- we have your name and I can get back to you on that.

AUDIENCE MEMBER: Through the State Department of Health?

AUDIENCE MEMBER: This is the New York State Department of Health. And I can clarify that for you. That was one of the things that we had mentioned in the health consultation, but recognize it was not any sort of a health study, where we went and took medical histories throughout the neighborhood. It was not that refined whatsoever. This was more of a registry, which I will get back to you on.

AUDIENCE MEMBER: That would be something that could be publicized, what the survey was?

AUDIENCE MEMBER: A lot of that is going to be confidential.

AUDIENCE MEMBER: But in numbers of percentages of how many maybe had, who knows what, kidney disease or, you know --

AUDIENCE MEMBER: I don't think we're going to have that information and I don't want to get into it anymore, because I'm not involved in anything with that registry and I don't want to misspeak.

AUDIENCE MEMBER: Okay. I understand.

AUDIENCE MEMBER: But I will find out as much information as I can for you and get back to you on that.

AUDIENCE MEMBER: Thank you.

MIKE SIVAK: Can I just add a little bit to that? When the site is proposed to the National Priorities List and an agency that is independent of EPA but works in conjunction with EPA is an agency called The Agency for Toxic Substances --

AUDIENCE MEMBER: Hold it closer. We still can't hear you.

MIKE SIVAK: You guys want to move down a little bit?

AUDIENCE MEMBER: No.

AUDIENCE MEMBER: Just speak up a little bit.

MIKE SIVAK: There's an agency called The Agency for Toxic Substances and Disease Registry and they're affiliated with the Centers for Disease Control and the Department of Health and Human Services. When a site is proposed they develop what is called a public health assessment that goes out to the public for public comments and ultimately published and sent out to the community. There would be copies of that at the repositories and they're listed inside the proposed plan, two of them, one in Little Valley and one in Salamanca at the library.

MR. BASILE: Correct.

MIKE SIVAK: There should be a copy of it in there. And there will be contact information in the Public Health Assessment for regional ATSDR representatives, as well, and we can also get you some of their names. Their job is to look at past exposures and past historical information and that report should document that.

AUDIENCE MEMBER: That was my next question, as to what other areas have health concerns that come up with other areas that have this TEC in their water? What main health problems have they experienced, if they have been able to define health problems, because of the TEC? At one time, weren't there some things that were kind of posed to us, you know, you could have these problems or these problems because of the vapor or the ingesting of the water itself or the vapor?

MIKE SIVAK: That would be the ATSDR. As far as potential health effects associated from exposure to TEC, we have some good information on that, but from epidemiological studies, as well as from animal studies, that tells us the TEC does affect the kidneys and the liver. It is a suspected, likely to be known -- excuse me, likely human carcinogen, and we do have some good information on what kinds of health effects we could expected to see from exposure to this chemical, as well as chemicals like this will be called these chlorinated volatile chemicals. They are sort of very similarly found together at sites, and so we have pretty good information on that.

AUDIENCE MEMBER: And that's what you're saying would be available at the library?

MIKE SIVAK: In the library should be the ATSDR, Agency for Toxic Substances and Disease Registry, there's the public health assessment for the Little Valley site. Again, that document is developed when a site is proposed to the NPL. So that site looks at all the data listed at the time for the listing. It looks at past exposures and likely sources of contamination and how people may have been exposed and makes recommendations to prevent future exposures or mitigating future exposures and cut down any health effects that we would see.

Our agency comments on that. There are independent agencies as well. We look at those recommendations and evaluate how we can incorporate them as well as follow the recommendations of our own people who are involved in the site to limit exposures.

We've all talked about and heard tonight how we feel we've done that by testing the wells and putting the POUT systems on those wells so no one will be drinking contaminated water. But that might be a document, that ATSDR public assessment might be a document that you could look into and it would be in the repositories.

AUDIENCE MEMBER: In Salamanca or Little Valley.

MIKE SIVAK: It's listed on the second page, the Town of Little Valley Municipal Building and the Salamanca Public Library. We also have a repository in our offices in Manhattan, and if anyone is interested in that, you need to make an appointment and contact Patricia and she'll help you coordinate an appointment, if anyone is in Manhattan and wants to stop by.

AUDIENCE MEMBER: Not likely.

AUDIENCE MEMBER: Probably not.

MR. BASILE: You also can contact, if you take this number down, I know the number by heart, because I get calls all the time. New York State Health Department has an excellent toll free number, 1 (800) 458-1158. You will be talking to some very qualified folks in New York State Health Department's Office of Epidemiology and Environmental Health. All you have to do is call that number and say you'd like to know what the health effects of TEC contaminations are and they will be happy to help you.

AUDIENCE MEMBER: Thank you.

AUDIENCE MEMBER: To add to that number, because you'll get bunch of prompts when you call an eight hundred number and they'll say, if you know the five digit extension, please press, I'll give it to you.

AUDIENCE MEMBER: All right.

MR. BASILE: What's the five digits?

AUDIENCE MEMBER: It is 27900.

AUDIENCE MEMBER: That's a long one. 27900?

AUDIENCE MEMBER: 27900. It's a five digit extension who you wish to contact.

AUDIENCE MEMBER: Okay. Thank you.

MR. BASILE: All right.

AUDIENCE MEMBER: I have a couple other questions. I'm a little confused. We started with EPA and then we went to DEC and now we're back with EPA. So DEC is really not involved?

MR. SINGERMAN: In the history or what? What are you talking about?

AUDIENCE MEMBER: The folks that were in charge first were EPA, right?

MR. SINGERMAN: No. Originally I think it was county and they were originally investigating Luminite.

AUDIENCE MEMBER: County, okay.

MR. SINGERMAN: And then it went to DEC and DOH and it was listed on the National Priority List in 1996, and then it became EPA's lead. They were responsible for putting the treatment systems on back in '97, and after five years of operation we turned it over to the State of New York and they're maintaining it right now. But to begin, even though the EPA is the lead, the state and county, they're all involved with it.

AUDIENCE MEMBER: So DEC is still involved?

MR. SINGERMAN: Yes. But we have the lead now, it's a federal Superfund site.

AUDIENCE MEMBER: When the air strippers were put on and the white pipe coming out and the air coming off the that, then that was a contaminate?

MR. SINGERMAN: It was stripped. It's basically going up. It's not being released at a breathable level but a higher level and it basically dissipates in the atmosphere.

AUDIENCE MEMBER: Even though it was coming out of my basement?

MR. SINGERMAN: Where was the pipe discharging to? The outside.

AUDIENCE MEMBER: Right.

MR. SINGERMAN: Once it goes outside, it dissipates.

AUDIENCE MEMBER: So that wasn't harmful --

MR. SINGERMAN: Not unless you sit there and breathe into the pipe. We do have systems where if it is a concern, we can carve our treatments in the amounts that are coming out. It's not a risk to public health.

AUDIENCE MEMBER: Then why are those taken off?

MR. SINGERMAN: Originally the levels were much higher and we put the strippers on based on those levels and we put a carbon unit in addition to that to polish it. And then after when we reassessed what was going on in the I think -- I believe it was 2001, 2002, what we saw is the levels had gone down and the actual operating expense would be much less expensive using carbon, so that was one of the reasons we switched to carbon.

Basically we have two carbon systems in series, so if one should eventually become saturated with contaminates, the next one would pick it up. There's never a threat that the carbon is not working.

Basically what happens, once of the carbon absorbs all the contamination and can't absorb any more, they pass on to the next one. That's why they are in series. Once they come through to check the systems and they see it has reached the contamination limit, they will replace the carbon. So it's basically to reduce the operation expenses, primarily because of the fact the contamination levels have gone down.

AUDIENCE MEMBER: Okay. If we were to hook up to the big water main in the village, which it doesn't sound like you want to go for, because you see it decreasing, but what would a time frame be to hook up to something like that?

MR. SINGERMAN: If we were to select that as a remedy, first of all, it would take a number of years to design. It would take probably a while to connect. Also assuming we have the money available to fund it. The Superfund really has diminishing funds at this point in time. A hundred and thirty-six thousand dollars to do an excavation is fairly easy to come by, but three and a half million dollars to hard to come by.

AUDIENCE MEMBER: Three and a half --

MR. SINGERMAN: To put a waterline in and hook everyone up. You also have to keep in mind, you would also -- the expense of the water, you would have to pay for the water, which apparently, right now, the only expense is related to operating your pump. You would -- all the individual homeowners would be responsible for paying for the water and also responsible for the pipe from the house to the street. So you'd pick up responsibilities for that.

AUDIENCE MEMBER: Aren't the village --

MR. SINGERMAN: The way it works, the water company is responsible for the pipeline in the street but the homeowner is responsible from the street to the home. The individual homeowners would be responsible for the pipeline from the house to the street, and if this pipe broke, you would be responsible for it and also responsible for paying for the cost of the water.

In other words, sometimes insurance reductions, because of the fact that you would normally put in fire plugs, so that would sometimes reduce the cost of the homeowner's insurance because of the fact that makes it more attractive to insurance companies because of the fact that you could bring a fire truck in there to hook up to the fire plug. In addition, sometimes it improves the value of the property, but then you have to weigh a lot to see whether or not the cost is actually receiving a bills -- the frequency of receiving the bills for the water, which is not free, so you have to weigh that and the cost of constructing the waterlines, which I said a number of times. We received diminishing levels and we think the systems are doing the job and continuing to do the job in the ten years when we reach the standard.

AUDIENCE MEMBER: Okay. Thank you very much.

AUDIENCE MEMBER: I brought part of my file with me and I found a copy of the state health department's public health assessment that was prepared back in December, 2000, and I had copies of letters and memos here and a draft of this was distributed to the residents in the study area. I don't know if you recall this. And it was finalized and copies were sent out to all the municipal officials and it says here, and numerous residents. I don't know if it went to all the residents. It says in item three, residents who were exposed to the fact of TCEs in drinking water will be asked to participate in the exposure register. There might have been a mailing that went out. Is there something that you think you responded to?

AUDIENCE MEMBER: It was something that we filled out and sent in that had health concerns on it.

AUDIENCE MEMBER: We're not sure what kind of follow-up there would be to that down the road in future years. There's something that you can ask the question and find out.

AUDIENCE MEMBER: Okay.

AUDIENCE MEMBER: I think all they do is enter you in a big state database along with other residents and other communities in the state where people were drinking TCE contaminated water too, and ten years down the road they may send a follow-up questionnaire to see if anybody has developed any diseases or carcinogens.

AUDIENCE MEMBER: It would be interesting to see what other people have come up with health problems and you can think, ugh, I have that.

AUDIENCE MEMBER: The state has a cancer register and hopefully they follow people decades down the road and see if they develop any complications or health effects from being exposed over the long term.

AUDIENCE MEMBER: Okay. Well, it's just a length of time in between when we get mailings, I've forgotten what we did, but it seems we filled out something with health concerns.

AUDIENCE MEMBER: And I'm sure there's no reports generated. They simply entered you in the database.

AUDIENCE MEMBER: Yeah, I'm sure they don't want to say, John Doe down the road --

AUDIENCE MEMBER: When we did the sampling, your individual samplers are also considered confidential. Your results have never been shared with other residents. All that data is considered confidential.

AUDIENCE MEMBER: Other than the big places, Bush and --

AUDIENCE MEMBER: Right. For purposes of their investigation, they have to identify some of that data, so they can justify their conclusions and their selected remedies.

AUDIENCE MEMBER: Okay. Thank

you very much.

AUDIENCE MEMBER: Just a couple quick things. One correction, it's the Village of Little Valley Municipal Building, not the town.

MIKE SIVAK: I apologize. That's my mistake.

AUDIENCE MEMBER: And do you guys have a website or something that people could go on and look up a lot of this information?

MIKE SIVAK: The site information?

AUDIENCE MEMBER: Yes. Do you have a website to go on and bring up on the Net?

MR. SINGERMAN: About the site or health effects?

AUDIENCE MEMBER: About anything in this report.

MR. SINGERMAN: Well, the site -- there's a website that has a summary about the site, but really, the document you have there pretty much summarizes more information than the website, about the site. Basically, this summarizes all the documents that we had that led to the basis of our preferred remedy.

AUDIENCE MEMBER: The best thing somebody can do is go to the repositories.

AUDIENCE MEMBER: People love to read stuff on the Internet.

MR. BASILE: The document you have is probably the most official document and the most in-depth, but if you want general information about EPA activity, you can go to www.epa.gov and it gives you a variety of different prompts. You can go to Superfund sites and you can look at a variety of different activities that we're involved in. To answer your question. That's our general website.

Again, if you had any additional comments between now and the end of the public comment period, you have the agenda, you can address them to Patricia Simmons Pierre. If there are no further questions, we will definitely continue to keep you in the loop and we thank you for your participation this evening.

AUDIENCE MEMBER: I got one more thing. Where you guys proposed to dig up those two sections, is there anything there that you found in testing? Has there been sampling dug up or barrels buried or what is it? It's like a mystery.

MR. SINGERMAN: It's --

AUDIENCE MEMBER: I understand what it is. There's barrels buried there.

MR. FEENEY: We don't know that yet. We know that soil samples are collected from borings above the state cleanup levels. When we do get to excavating, we may find barrels.

AUDIENCE MEMBER: You're assuming that the areas that you did testing on --

MR. FEENEY: We have one

or two samples that exceed the state standards, so we know we have to excavate. We decided to excavate an area twenty-five by twenty-five, which Patricia said earlier, when we get to twenty-five to twenty-five and four to five feet that we plan, we're going to see if we're exceeding the level or not, the state level. If not, we're done, or we'll keep going sideways or deeper. And if we find drums, maybe there's more sampling we missed and we need to do more sampling, but at this point we don't think there is.

AUDIENCE MEMBER: Okay. Thank you.

MR. BASILE: Thank you very much and have a good evening.

* * * * *

STATE OF NEW YORK)

SS:

COUNTY OF ERIE)

I, SANDRA SMITH LIPKE, a Notary Public in and for the State of New York, County of Erie, DO HEREBY CERTIFY that the proceedings were taken down by me in a verbatim manner by means of Machine Shorthand. That the proceedings were taken to be used in the above-entitled action.

I further CERTIFY that the above-described transcript constitutes a true, accurate and complete transcript of the testimony.

SANDRA SMITH LIPKE,
Notary Public.

RESPONSIVENESS SUMMARY

APPENDIX V-e

E-MAIL SUBMITTED DURING THE PUBLIC COMMENT PERIOD

EPA CLEAN UP - Lotus Notes

File Edit View Create Actions Help

Address

Region 2 Welcome Page | Patricia Pierre - Inbox | Re: Are you here? | EPA CLEAN UP

New Memo | Reply | Reply To All | Forward | Delete | Follow Up | Folder | Copy Into New | Chat | Tools | Report SPAM

Annette Gade <satgade@aapt.net.au>

07/03/2005 01:32 AM

To Patricia Pierre/R2/USEPA/US@EPA

cc

bcc

Subject EPA CLEAN UP

History: This message has been forwarded.

To Ms Pierre,

Your state is to be congratulated in regard to the action being taken.Our State has a large problem in regard to PCB's the only one's classing it as a concern is the communities.Our government intends to construct houses Where a power plant once stood,which is full of PCB's & many other toxins.Keep up the good work at least the US EPA are doing what is correct and are taking the initiative to rectify the problem.

Anne Gade

start | EPA CLEAN UP - Lot... | Disconnected | Office | 3:31 PM