Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision
American Felt & Filter Company Site
Town of New Windsor, Orange County, New York
Site Number 3-36-036

March 2004

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* ERIN M. CROTTY, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

American Felt & Filter Company Inactive Hazardous Waste Disposal Site
Town of New Windsor, Orange County, New York
Site No. 3-36-036

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the American Felt & Filter Company site, a Class 2 inactive hazardous waste disposal site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the American Felt & Filter Company inactive hazardous waste disposal site, and the public's input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

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

Description of Selected Remedy

Based on the results of the Remedial Investigation and Feasibility Study (RI/FS) for the American Felt & Filter Company site and the criteria identified for evaluation of alternatives, the NYSDEC has selected a dual phase extraction or DPE system. The components of the remedy are as follows:

- Installation of a dual phase extraction or DPE system, which is a soil and groundwater contamination treatment system.

- Installation of three bedrock monitoring wells on the eastern perimeter of the site.

- Implementation of a groundwater monitoring program to assess the effectiveness of the DPE system.

- Implementation of a soil gas monitoring program that would include a baseline and annual soil gas sampling of the area of impact beneath the building.

- Development of a soils management plan in order to address any residual contaminated soils that may be excavated from the site during future redevelopment.

- Imposition of an institutional control in form of an environmental easement that would: (a) require compliance with the approved soils management plan, (b) limit the use and development of the property to commercial or industrial uses only; (c) restrict the use of groundwater as a source of potable or process water to that which has the necessary water quality treatment as determined by the Orange County Department of Health; and, (d) require the property owner to provide an annual certification of compliance with the above.

- Operation and maintenance of the components of the remedy until the remedial objectives have been achieved, or until the NYSDEC determines that continued operation is technically impracticable or not feasible. At the time of this determination, a workplan would be developed to perform a post-remediation evaluation of the effectiveness of the DPE system in eliminating potential exposure from sub-slab vapor impacts. Once the system is shut down, this evaluation of sub-slab vapor would be completed. If the evaluation indicates that contamination remains, mitigation of contamination would be necessary through a depressurization system. The DPE system under the building could be modified for that purpose.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy selected for this site is protective of human health.

Declaration

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

MAR 31 2004
Date

Dale A. Desnoyers, Director
Division of Environmental Remediation

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RECORD OF DECISION

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Town of New Windsor, Orange County, New York
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SECTION 1: SUMMARY OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has selected this remedy for the American Felt & Filter Company site. The presence of hazardous waste has created significant threats to human health and/or the environment that are addressed by this remedy. As more fully described in Sections 3 and 5 of this document, releases from historical mishandling of solvent drums have resulted in the disposal of hazardous wastes, including volatile organic compounds (VOCs), especially 1,1,1-trichloroethane (TCA). These wastes have contaminated the soil, groundwater and indoor air at the site, and have resulted in:

- a significant threat to human health associated with potential exposure to indoor air, soil and groundwater at the site.
- a significant environmental threat associated with the impacts of contaminants to groundwater.

To eliminate or mitigate these threats, the NYSDEC has selected the following remedy:

- Installation of a dual phase extraction or DPE system, which is a soil and groundwater contamination treatment system.
- Installation of three bedrock monitoring wells on the eastern perimeter of the site.
- Implementation of a groundwater monitoring program to assess the effectiveness of the DPE system.
- Implementation of a soil gas monitoring program that would include a baseline and annual soil gas sampling of the area of impact beneath the building.
- Development of a soils management plan in order to address any residual contaminated soils that may be excavated from the site during future redevelopment.
- Imposition of an institutional control in form of an environmental easement that would: (a) require compliance with the approved soils management plan, (b) limit the use and development of the property to commercial or industrial uses only; (c) restrict the use of groundwater as a source of potable or process water to that which has the necessary water quality treatment as determined by the Orange County Department of Health; and, (d)

require the property owner to provide an annual certification of compliance with the above.

- Operation and maintenance of the components of the remedy until the remedial objectives have been achieved, or until the NYSDEC determines that continued operation is technically impracticable or not feasible. At the time of this determination, a workplan would be developed to perform a post-remediation evaluation of the effectiveness of the DPE system in eliminating potential exposure from sub-slab vapor impacts. Once the system is shut down, this evaluation of sub-slab vapor would be completed. If the evaluation indicates that contamination remains, mitigation of contamination would be necessary through a depressurization system. The DPE system under the building could be modified for that purpose.

The selected remedy, discussed in detail in Section 8, is intended to attain the remediation goals identified for this site in Section 6. The remedy must conform with officially promulgated standards and criteria that are directly applicable, or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, criteria and guidance are hereafter called SCGs.

SECTION 2: SITE LOCATION AND DESCRIPTION

The American Felt and Filter Company site (hereinafter, "the site") is located at 361 Walsh Avenue on the northern border of the Town of New Windsor, Orange County, New York (Fig. 1). The first on-site manufacturing building was constructed and began operation at this location in the late 1800's.

The site is an industrial complex (Fig. 2) located along the south bank of Quassaick Creek, which forms the dividing line between the City of Newburgh to the north and the Town of New Windsor to the south. The site is relatively flat on its northern and eastern sides, but relatively hilly on its southern and western sides.

The site is approximately eight acres in size, and contains four principal buildings: the laboratory building (now vacant) in the southeast corner of the property, the materials receiving building just west of the laboratory building, the main building near the center of the site, and the piano felt building located on the north side of the main building. The Hudson River lies approximately 1000 feet to the east of the site.

The area surrounding the site is mostly undeveloped. A large steeply sloping vacant property lies to the south and is used to store motor vehicles. An asphalt plant lies to the west of the automobile storage facility, while additional commercial properties (including a former gasoline station operation) are located further west (along Route 9W).

East of the site lie vacant lands stretching down to River Road, further east of which lie a series of industrial properties, mostly bulk oil storage, lining the Hudson River. North of the site is vacant wooded property (zoned for residential use by the City of Newburgh), west of which lies industrial property and north of which lie railroad tracks and single-family homes on a hill overlooking the site.

The area around the site generally slopes down from west to east, from Route 9W to the Hudson River. However, the site is flat in the vicinity of its buildings, but slopes steeply up to Walsh Avenue on its south side and more gently so on its west side (where a series of constructed ponds exist, which constitute part of the site's former water supply). The elevation of the flat central area of the plant site is approximately 20 feet above sea level.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The site has been used for the manufacture of felt and felt products since the late 1800's, when the American Felt Company began manufacturing felt fabrics for general use. The Company changed hands several times over the years, but its original name was retained until 1978, when the GAF Corporation sold the Company, at which time the "American Felt Company" became the "American Felt and Filter Company". The present owners bought the property in the early 1990's, and retained the new name.

The felt products currently manufactured at the site include felt fabrics and felts that are impregnated with chemicals for various products and mechanical uses, including filtration. For example, the felt manufactured at the site is used in piano hammers and dampeners, felt-tipped marking pens, and portable face filters used in the mining industry. Felt-tipped marking pens use felt impregnated with phenolic resin, while portable face mask filters use felt impregnated with a zinc compound. Felts are also dyed at the site with a variety of organic and synthetic dyes.

Two phenolic resin storage tanks were formerly located in the south part of the site between the laboratory building and the receiving building. These tanks were taken out of service in the mid-1990's. Phenol is no longer used or stored at the site.

Filter masks were manufactured by dissolving a zinc compound in TCA, then soaking felt sheets in this mixture. The solvent was extracted from the felt by first squeezing the liquid out of the felt. The felt sheets were then heated in a low temperature oven, after which the sheets were pressure-formed into masks, and cut for packaging.

The water supply for the site was originally the Quassaick Creek. Here a low dam, at the northwest corner of the site, was used to divert a portion of the creek flow via a sluice into a channel leading to a storage pond, which is the "coagulating basin" shown in Fig. 2. Water was drawn from this pond, after settling, to a water filtration system and the treated water was pumped to one of two storage areas with a total capacity of 150,000 gallons. This treated water was then available for distribution throughout the site.

In 1940's, several wells were installed to supplement the water supply for war production activities at the plant. However, the use of site well and creek water for process water ceased in 1994, when the site was connected to the Town of New Windsor's municipal water supply. The processing pond ceased to be used for storage prior to 1994, when felt production decreased (but was never discontinued) at the site. However, the 268,000-gallon coagulating basin continued to be used for storage of untreated water for fire protection purposes, and as a source of untreated water for the two-stage water treatment system, until the site connected to town water in 1994. At this point, the creek diversion and the water treatment systems were closed, and the coagulating basin and water tower ceased to be used for water storage.

Process water at the site is used as steam to produce felt from natural and synthetic fibers, and for dying felt fabrics. Since the early 1990's, the site's highly acidic wastewater (due to the use of hydrochloric acid during the dying process) has been neutralized with sodium hydroxide prior to discharge. The treated wastewater is combined with condensed steam from the felt production process before being discharged to the Town of New Windsor's wastewater treatment plant. Stormwater from the site, however, enters Quaissack Creek through a system of yard drains. In the past, traces of phenol and TCA have been detected in this stormwater discharge, which is now regulated under a NYSDEC SPDES permit.

TCA was historically delivered in 55-gallon drums to a storage area on the northwest side of the main building, where it was pumped via a pneumatic pump to a tray just inside the northern wall of the main building, where a zinc compound was added to the TCA as part of the felt manufacturing process for face filters. Based on interviews with past employees, there were numerous spills inside and outside the main building in this portion of the site. This oral history correlates with the findings of the remedial investigation, in that the highest concentrations of TCA have been found in the soil and groundwater in this north central portion of the site, immediately south of Quassaick Creek.

The use of TCA at the site was discontinued in the early 1990's, when this part of the felt manufacturing process was contracted out to a facility that could recycle TCA economically. Therefore, while felt manufacturing continues at the site, manufacturing is limited to physical manipulation and dying of felt products, since the felt material now comes to the site already impregnated with a zinc resinate.

3.2: Remedial History

In 1991, the NYSDEC listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

The contamination at the site was discovered during the sampling of a storm water discharge from the site into the Quassaick Creek in 1987. Because of the VOC contamination detected in the storm water, a groundwater study was made a condition of a SPDES permit for the site. The groundwater study, performed in 1988, found an area of shallow TCA groundwater contamination centered on the northwest corner of the main mill building. A deep water supply well in that portion of the site, E-1, was also found to be contaminated with TCA. On the basis of these findings, an initial remedial investigation was performed in December 1988. This study included additional sampling for groundwater contamination delineation purposes. A soil gas survey was also conducted in the northwest quadrant of the site. Soil samples were taken at locations with measurable levels of VOC contamination in the soil gas samples. TCA soil contamination was found concentrated inside and outside of the northwest corner of the main mill building, which correlated with the area where TCA was historically stored and used. Based upon the above the site was listed.

The contaminants of concern at the site are limited to VOCs. Although zinc was utilized in the manufacturing process, it is not of significant health or environmental concern. Therefore, no metals, including zinc, have been sampled for at the site.

SECTION 4: ENFORCEMENT STATUS

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

The NYSDEC and the American Felt and Filter Company entered into a Consent Order on March 31, 1998. The Order obligates the responsible party to implement an RI/FS remedial program. Upon issuance of the ROD the NYSDEC will approach the PRPs to implement the selected remedy under an Order on Consent.

SECTION 5: SITE CONTAMINATION

A remedial investigation/feasibility study (RI/FS) has been conducted to evaluate the alternatives for addressing the significant threats to human health and the environment.

5.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between January 1988 and November 2002. The field activities and findings of the investigation are described in the RI report.

The following activities were conducted during the RI:

- Groundwater sampling was conducted during August 1998 to assess the extent of groundwater contamination in the shallow and deep aquifers underlying the site (see Fig. 2). Nine shallow wells and five bedrock water supply wells were sampled. These shallow wells were installed as one-inch diameter slotted well casings placed within the two-inch diameter holes that remained after soil samples were taken at these locations with "geoprobe". No sand packs were installed around these temporary well casings and no development of these wells was performed. However, the wells were purged prior to sampling.

- Surface water sampling was conducted at four locations on Quassaick Creek in 1998 (Fig. 3).

- Soil gas surveys were conducted at 113 locations during 1998 and 2001 (Figs. 3, 4), in order to assess the extent of TCA contamination in the soil. A greater density of soil-gas samples was taken in the north central area of the site where TCA was stored and used.

- Soil sampling was conducted during 1998 and 2001 in order to delineate soil contamination levels (Fig. 4).

- Indoor air sampling was conducted at three locations in the northwest corner of the main mill building during December 2002, in order to evaluate the impacts on indoor air from subsurface contamination.

- A survey of public and private water supply wells in the area around the site.

To determine whether the soil, groundwater, and indoor air contain contamination at levels of concern, data from the investigation were compared to the following SCGs:

- Groundwater, drinking water, and surface water SCGs are based on NYSDEC "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.

- Soil SCGs are based on the NYSDEC "Technical and Administrative Guidance Memorandum (TAGM) 4046; Determination of Soil Cleanup Objectives and Cleanup Levels".

- Indoor air SCGs are based on the New York State Department of Health Database (NYSDOH Database) which is a summary of indoor and outdoor air sample results in control homes collected and analyzed by the NYSDOH from 1989 through 1996.

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

5.1.1: Site Geology and Hydrogeology

The site is located in the northern portion of Orange County, and is characterized by gentle rolling hills and valleys. Bedrock beneath the site consists of alternating layers of hard sandstone and softer shale which have been folded so that the originally horizontal beds now dip at steep angles.

A 20-55 foot thick layer of glacial till overlies the bedrock. The till unit, which is found throughout much of Orange County, is a compacted, unsorted mixture of boulders, sand, silt and clay, which in general does not transmit water readily. A glacial outwash deposit overlies the till. The outwash is made up of fine-to-coarse grained silty sand deposited by glacial melt water. It transmits water much more readily than the till and is considered a potential aquifer. Its thickness ranges from 10 feet to over 50 feet at the western perimeter of the site.

Figure 2 shows the location of the nine shallow overburden monitoring wells (i.e., S-1 through S-9), the new bedrock monitoring well (i.e., E-1 New), and the five historical bedrock wells (i.e., E-1 through E-5). E-1, 2 and 4 are deep bedrock wells that range in depth from 225-305 feet below ground surface (bgs), while E-3 and E-5 are shallow bedrock wells that go about 50 feet bgs.

The shallow monitoring wells S-1 through S-9, which range in depth from 2-13.2 feet, were installed in the glacial outwash deposits above the till layer to monitor the groundwater, which generally lies within five feet of the ground surface.

Overburden groundwater appears to flow northeast to Quassaick Creek, based on the 2002 static water elevation data. The estimated discharge of overburden groundwater to Quassaick Creek is 44,000-440,000 gallons per day. During high-water periods, the relatively shallow overburden groundwater can actually be seen seeping from the steep hillslope on the southern perimeter of the site along Walsh Avenue.

Permeability tests have not been performed on the glacial outwash deposits, however, the permeability of these outwash deposits can be estimated to be between 100 to 1000 gallons per day per square foot, based on reference values from tests done elsewhere on similar deposits. In a similar fashion, the site's underlying till has an estimated permeability of 0.01 to 1 gallons per day per square foot, which makes it highly impermeable.

Since the original TCA source was due to TCA handling on the surface of the site, and since this TCA contamination has been found in bedrock well E-1, there appears to be a hydraulic connection between the overburden and the bedrock groundwater. Also, during the 1963 installation of E-1, the water elevation changed from 40 feet bgs to 72 feet bgs. Thus, the vertical hydraulic gradient appears to be down instead of up, and groundwater recharge appears to be a low flow process.

Water elevation measurements were recorded in all on-site wells during November 2002. An analysis of these measurements revealed that the deep rock aquifer was at a higher (or artesian) pressure as compared with the shallow glacial outwash aquifer, especially since several of the deep wells were discharging water to the ground surface. Therefore, it now appears that the deep rock aquifer exhibits artesian properties during wet periods, but this may not be the case during drought conditions.

Carbonate rock occurs throughout Orange County along with shale. The solubility of the carbonate rock results in solution channels that can cover large distances, and for which no maps are currently available. However, the most likely source of TCA contamination within the carbonate portion of the bedrock below the site is the TCA contamination that was released into the overburden groundwater at the site. Also, the TCA contamination of the bedrock groundwater appears to be greater than that for the bedrock groundwater, which is probably due to the hydraulic connection between the two.

5.1.2: <u>Nature of Contamination</u>

As described in the RI report, many soil and groundwater samples were collected to characterize the nature and extent of contamination. As summarized in Table 1, the main categories of contaminants that exceed their SCGs are volatile organic compounds (VOCs).

The VOCs of concern are TCA and its breakdown products. TCA is a colorless liquid with a sharp, sweet odor; and is found in many common products, such as glue, paint, industrial degreasers, and aerosol sprays. TCA is also used as a solvent for textile processing and dyeing.

TCA is a concern in both drinking water and as a result of volatilization into soil gas which may subsequently impact the indoor air of buildings.

The breakdown products of TCA include various organic compounds, such as 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethene (1,1-DCE), 1,1,2-TCA, 1,2-DCA, chloroethane, 1,2-DCE, TCE (trichloroethene), and vinyl chloride.

5.1.3: Extent of Contamination

This section describes the findings of the investigation for all environmental media that were investigated.

Chemical concentrations are reported in parts per billion (ppb) for water; parts per million (ppm) for soil, sediment and soil gas; and micrograms per cubic meter ($\mu g/m^3$) for indoor air samples. For comparison purposes, where applicable, SCGs are provided for each medium.

Tables 1A and 1B summarize the degree of contamination for the contaminants of concern in groundwater, surface water, soil, and indoor air, and compare the data with the SCGs for the site. The following are the media which were investigated and a summary of the findings of the investigation.

Subsurface Soil

The 1998-2002 exceedances of the soil TAGM contaminant guidelines were mostly for TCA, and occurred in 8 of the 30 soil samples (Table 1B). TCA concentrations ranged from 0.002-960 ppm, with the maximum value being about three orders of magnitude above the TCA TAGM value of 0.8 ppm. The 15 soil-sampling locations can be found in Fig 4. All samples except one were taken at a depth of no more than 11 feet. The exception was one sample at E-1 New taken at a depth of 23-25 feet. The latter sample did not exceed soil TAGM contaminant guidelines.

In contrast, the 1988-1994 exceedances of the soil TAGM contaminant guidelines (mostly for TCA) occurred in 5 of the 12 soil samples (Table 1A). TCA concentrations ranged from 0.012-2.6 ppm, with the maximum value being about three times higher than the TCA guideline of 0.8 ppm. All samples were taken at a depth ranging from 2-8 feet. The delineation of TCA contamination in subsurface soil is shown in Fig. 6.

Groundwater

The 1998-2002 exceedances of the groundwater standards were mostly for TCA and 1,1-DCA and occurred in 11 of the 29 groundwater samples (Table 1B). TCA concentrations ranged from 1.5-50,000 ppb, with the maximum value (recorded in a one-time sample of temporary well WSG-5 in the source area of contamination) being about four orders of magnitude above the TCA standard of 5 ppb; while 1,1-DCA concentrations ranged from 1-5,400 ppb, with the maximum value being about three orders of magnitude above the 1,1-DCA standard of 5 ppb. The 18 groundwater-sampling locations can be found in Figs. 3 and 4.

In contrast, the 1988-1994 exceedances of the groundwater standards were mostly for TCA and occurred in 15 of the 42 groundwater samples (Table 1A). TCA concentrations ranged from non-detect (with a detection limit of 1 ppb) to 2,800 ppb, with the maximum value being about 2.5 orders of magnitude above the TCA standard of 5 ppb.

Monitoring wells E-1 and S-8 constitute a well couplet at the northern perimeter of the site. In January 1988, TCA contamination in bedrock groundwater was recorded at 2,800 ppb in E-1, while a maximum overburden groundwater contamination of 1,400 ppb was recorded in S-8.

By November 1998, TCA in bedrock groundwater was recorded at 700 ppb in monitoring well E-1, while in November 2001, TCA contamination in bedrock groundwater was recorded at 490 ppb in monitoring well E-1 New (which is a new, shallower, bedrock well replacing E-1). In comparison, TCA contamination in the site's overburden wells decreased more rapidly, with the maximum values of TCA recorded in S-8 being 20 ppb in August 1998 and 9.8 ppb in November 2001.

The delineation of overburden and bedrock groundwater areas of TCA contamination are shown in Fig. 7. A close examination of the figures reveals that the TCA contamination is centered on the northwest corner of the main building (both inside and outside). TCA groundwater contamination peaks at 50 ppm at location WSG-5, which lies about 17 feet north of the perimeter of the main building; while TCA soil contamination peaks at 960 ppm at location "0,2", which lies about 12.5 feet south of WSG-5.

One private well has been identified in a comprehensive well survey that included all properties located within a one-half mile radius of the perimeter of the site. This well, located about 800 feet southeast of the site, is a cistern which collects shallow groundwater. The well, which is side gradient to the northeasterly overburden groundwater flow direction (i.e., towards Quassaick Creek) and easterly of the bedrock groundwater flow direction (i.e., towards the Hudson River), has been sampled twice. Neither sample exceeded the 5ppb standard for TCA in drinking water. While the initial sample contained a level of TCA less than the 5 ppb standard), the second sample was non-detect for TCA.

Surface Water

The maximum value of TCA detected in Quassaick Creek among the four samples taken during the 1998-2002 period (see Fig. 3) was 3 ppb (Table 1B). This value is an order of magnitude lower than the maximum of 33 ppb of TCA detected during the 1988-1994 period of sampling. However, neither value exceeded the NYSDEC ambient water quality chronic (280 ppb) or acute (2,500 ppb) toxicity guidance values for TCA in surface water; and there are no other surface water quality guidance values or standards applicable to Quassaick Creek.

Soil Gas

A soil gas survey was performed throughout the site during 1988 and 1998, but focused on the northwest corner of the main building (both inside and outside) in 2001. The methodology for the soil gas survey was to drive a hardened probe into the soil to a depth of 3 feet, and use a PID meter to record the VOCs concentration in parts per million (ppm). Confirmatory soil samples were taken at selected locations based primarily on the highest soil gas concentrations recorded. The delineation of soil gas areas of TCA contamination are shown in Fig. 6.

During 1998-2002, soil gas concentrations of VOCs ranged from 0-3,041 ppm among 133 samples from 113 locations (Table 1B; also Figs. 3, 4). In contrast, soil gas concentrations of VOCs ranged from 3-1,000 ppm among 35 samples taken during 1988-1994 (Table 1A). However, there are no SCGs for soil gas.

Indoor Air

Three indoor air samples were collected in the western side of the main mill building in December 2002. Concurrently, one ambient outside air sample was collected as a reference background sample. Indoor air TCA concentrations ranged from 11.1 – 1,778 ug/m^3 (Table 1B). It should be noted that the highest TCA level detected (1,778 ug/m^3) was from a below grade covered sump, not normally accessible. The levels of TCA in indoor air exceeded the NYSDOH typical indoor air background range of 2.4 - 6.7 ug/m^3. TCA was not detected in the outside ambient sample above the NYSDOH typical outdoor background range of 1.0 - 2.8 ug/m^3.

5.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS.

There were no IRMs performed at this site during the RI/FS.

5.3: Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Section 5.3 of the RI report.

An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.

The source of contamination is the location where contaminants were released to the environment (any waste disposal area or point of discharge). Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

An exposure pathway is complete when all five elements of an exposure pathway exist. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

Analytical results obtained for the Remedial Investigation sampling indicate that, based on the level and frequency of exceeding recommended cleanup objectives, VOCs are the primary constituent of potential concern at the American Felt and Filter Site.

Potential exposures were evaluated for facility employees, non-employee visitors to the Site (i.e.: construction workers or trespassers) and nearby residents from contaminants in groundwater, soil and soil vapor. The following discussion addresses the potential exposure pathways present at the Site. Due to the low concentration of contaminants in surface water, exposure pathways were not evaluated for these media.

Inhalation:

Inhalation of indoor contaminant vapors is an exposure pathway. TCA and associated chlorinated VOCs present in soil and groundwater may volatilize into soil gases and, consequently, enter buildings through foundation cracks or openings. Volatilization of vapors into indoor breathing areas is a possible exposure pathway for employees and/or site visitors within buildings.

In addition to indoor air exposures related to soil vapor, disturbances of the subsurface soils during construction related activities could potentially expose construction workers to contaminants through inhalation of soil particulates or vapors released from groundwater.

The potential for inhalation of VOC contaminated vapors by nearby residents is remote due to the distance between the homes and the site. VOC vapors would readily dissipate before travelling any distance in air.

Ingestion or Direct Contact:

Exposures of facility employees and site visitors to VOC contaminated soils at the site through ingestion or dermal contact is remote. As previously discussed, contaminated soils and groundwater are at depth and not accessible for direct contact.

During construction activities where subsurface soils are disturbed or removed, construction workers could come in contact with contaminated soil and groundwater, potentially resulting in ingestion or dermal exposures.

The facility and nearby homes are supplied with municipal water. The one exception to this is a home approximately ½ mile side gradient to the site which maintains and uses a private well. Exposures of residents to contaminated soils and groundwater at the site is not expected. However, the extent of the groundwater plume downgradient from the site will be further evaluated.

5.4: Summary of Environmental Impacts

This section summarizes the existing and potential future environmental impacts presented by the site. Environmental impacts include existing and potential future exposure pathways to fish and wildlife receptors, as well as damage to natural resources such as aquifers and wetlands.

The impact of the site on fish and wildlife in Quassaick Creek, which forms the northern border of the site, is believed to be minimal. This assessment is based upon the results from 13 surface water samples, none of which exceeded the NYSDEC ambient water quality chronic (i.e., 280 ppb) or acute (i.e., 2,500 ppb) toxicity guidance values for TCA (Tables 1A and 1B). Therefore, a viable exposure pathway to fish and wildlife receptors does not appear to exist.

Nevertheless, site contamination has impacted the groundwater resource underneath the site.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The remediation goals for this site are to eliminate or reduce to the extent practicable:

- exposures of persons at or around the site to VOCs in groundwater and soil;
- environmental exposures of flora or fauna to VOCs in Quassaick Creek;
- the release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards; and
- the release of contaminants from subsurface soil and groundwater under buildings into indoor air through soil vapor.

Further, the remediation goals for the site include attaining to the extent practicable:

- ambient groundwater quality standards and
- soil and indoor air SCGs.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the American Felt and Filter Company site were identified, screened and evaluated in the FS report which is available at the document repositories identified in Section 1.

A summary of the remedial alternatives that were considered for this site are discussed below. The present worth represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration.

This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved.

7.1: <u>Description of Remedial Alternatives</u>

The following potential remedies were considered to address the contaminated groundwater, soil and air at the site.

Alternative 1: No Action (Except Monitoring of Select On-Site Wells)

Present Worth: *$77,150*
Capital Cost: *$41,600*
Annual OM&M:
(Years 1-5): *$10,400*

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an unremediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2: Soil Vapor Extraction; Monitoring of Select On-Site Wells and Three New Bedrock Wells; Institutional Controls

Present Worth: *$259,300*
Capital Cost: *$130,000*
Annual OM&M:
(Years 1-5): *$37,800*

Under Alternative 2, a soil vapor extraction (SVE) system would be installed. The SVE system would consist of a vacuum pump, a minimum of two extraction wells, and activated carbon treatment for the soil vapor. This alternative would include a groundwater monitoring program, along with an institutional control in the form of an environmental easement that would: (a) require compliance with the approved soils management plan, (b) limit the use and development of the property to commercial or industrial uses only; (c) restrict the use of groundwater as a source of potable or process water to that which has the necessary water quality treatment as determined by the Orange County Department of Health; and, (d) require the property owner to complete and submit to the NYSDEC an annual certification.

Alternative 3: Bio-Remediation; Monitoring of Select On-Site Wells and Three New Bedrock Wells; Institutional Controls

Present Worth: *$174,700*
Capital Cost: *$162,500*
Annual OM&M:
(Years 1-5): *$32,800*

Under Alternative 3, a bio-remediation system would be installed. The bio-remediation system would consist of wells and the quarterly application, for a period of two to three years, of reactive chemicals to stimulate biological activity. This alternative would include a groundwater monitoring program, along with an institutional control as outlined in Alternative 2.

Alternative 4: Dual Phase Extraction; Monitoring of Select On-Site Wells and Three New Bedrock Wells; Institutional Controls

Present Worth: *$318,500*
Capital Cost: *$155,000*
Annual OM&M:
(Years 1-5): *$47,800*

Under Alternative 4, a dual phase extraction system consisting of a number of wells and ancillary equipment to extract groundwater and soil gas would be installed (Fig. 5). The dual phase extraction system would be operated to treat recovered soil- vapor and groundwater with activated carbon. This alternative would include a groundwater monitoring program, along with an institutional control as outlined in Alternative 2.

Alternative 5: Capping; Monitoring of Select On-Site Wells and Three New Bedrock Wells; Institutional Controls

Present Worth: *$105,150*
Capital Cost: *$60,000*
Annual OM&M:
(Years 1-5): *$13,200*

Under Alternative 5, a cap covering an area of about 200 square yards would be installed. The cap would consist of a 2-foot cover of clean fill. This alternative would include a groundwater monitoring program, along with an institutional control as outlined in Alternative 2.

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which governs the remediation of inactive hazardous waste disposal sites in New York State. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the NYSDEC has determined to be applicable on a case-specific basis.

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

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

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

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

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

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

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

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the PRAP have been evaluated. The responsiveness summary (Appendix A) presents the public comments received and the manner in which the NYSDEC addressed the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

In general, the public comments received were supportive of the selected remedy.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based on the Administrative Record (Appendix B) and the discussion presented below, the NYSDEC has selected Alternative 4, Dual Phase Extraction as the remedy for this site. The elements of this remedy are described at the end of this section.

The selected remedy is based on the results of the RI and the evaluation of alternatives presented in the FS. Dual phase extraction would remove and treat contaminated groundwater from the shallow aquifer system and lower the water table sufficiently to create and, thereby, expose a greater expanse of unsaturated soil to the soil vapor extraction process for removal of any residual contamination. The DPE system would be designed to separate the liquid and air streams to allow separate treatment and discharge of each stream. This would be a cost-effective way to remediate the soil and groundwater contamination at the site.

Alternative 4 is being proposed because, as described below, it satisfies the threshold criteria and provides the best balance of the primary balancing criteria described in Section 7.2. It would achieve the remediation goals for the site by remediating the soils that create the most significant threat to public health and the environment, it would greatly reduce the source of contamination to groundwater, and it would create the conditions needed to restore groundwater quality to the extent practicable. Alternatives 2 and 3 would also comply with the threshold selection criteria but to a lesser degree or with lower certainty, while Alternative 5 fails to meet the threshold criteria because it would not treat or reduce groundwater contamination.

Because Alternatives 2, 3, and 4 satisfy the threshold criteria, the five balancing criteria are particularly important in selecting a final remedy for the site.

Alternatives 2 (SVE), 3 (bio-remediation), 4 (DPE) and 5 (capping) all have short-term impacts which can easily be controlled. The time needed to achieve the remediation goals would be longest for Alternative 3 and similar for Alternatives 2, 4, and 5.

Achieving long-term effectiveness could be accomplished by excavation and removal of the contaminated overburden soils. However, the age of the main building at the site would make it impractical to excavate the contaminated soil adjacent to, and underneath, it. Therefore, this alternative was eliminated from further consideration. However, Alternative 4 would be favorable because it would result in the remediation of most of the contaminated soil at the site, including the contaminated soil beneath the building.

SVE, bio-remediation, and capping would be less effective in remediating contaminated soil and groundwater than DPE. SVE would not readily remediate groundwater, while bio-remediation would be difficult to implement effectively for TCA. Furthermore, capping would not treat the source of contamination.

Alternative 4 would be favorable in that it is readily implementable. Alternatives 2 and 5 would also be implementable. However, pilot testing would be required to gauge the implementability of Alternative 3.

Alternatives 2, 3, and 4 would reduce the volume of waste on-site, although Alternative 4 would do it more effectively than Alternative 2 or 3. Alternative 5, however, would have no more effect on the volume of waste on site than Alternative 1, the "no action" alternative. While Alternative 4 would remove most of the contamination on-site, the residual contamination would require restrictions on the use of the property.

Alternatives 2, 3, and 4 would greatly reduce the mobility of contaminants on-site, while Alternative 5 would only slightly reduce the mobility of contaminants on-site. Only Alternatives 2, 3, and 4 would reduce the toxicity of contaminants by chemical/physical treatment; and Alternative 4 appears best able to achieve this in the least amount of time.

The cost of the alternatives varies significantly. Although capping (Alternative 5) would be less expensive than Alternatives 2, 3, and 4, it would not be a permanent remedy. Alternative 4 would be very favorable because it would be a permanent remedy that would eliminate most of a continuing source of soil and groundwater contamination at the site, justifying its expense in comparison to Alternatives 2 and 3.

The estimated present worth cost to implement the remedy is $318,500. The cost to construct the remedy is estimated to be $155,000 and the estimated average annual operation, maintenance, and annual monitoring costs after the first year are $47,800.

The elements of the selected remedy are as follows:

1. Installation of a soil and shallow groundwater contamination treatment system known as a dual phase extraction system or DPE system (Fig. 5). This will include the pre-design delineation of the areas of soil and groundwater contamination to be treated and pilot testing, as necessary, to determine the number and location of the extraction points.

2. Installation of three bedrock monitoring wells on the eastern perimeter of the site.

3. Implementation of a groundwater monitoring program. This program will allow the effectiveness of the DPE system to be monitored, and will include an ongoing review of the bedrock well data.

4. Implementation of a soil gas monitoring program that will include baseline and annual soil gas sampling of the area of impact beneath the building.

5. Development of a soils management plan in order to address residual contaminated soils that may be excavated from the site during future redevelopment. The plan will require soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations.

6. Imposition of an institutional control in the form of an environmental easement that will: (a) require compliance with the approved soils management plan, (b) limit the use and development of the property to commercial or industrial uses only; (c) restrict the use of groundwater as a source of potable or process water to that which has the necessary water quality treatment as determined by the Orange County Department of Health; and, (d) require the property owner to complete and submit to the NYSDEC an annual certification.

7. The property owner would provide an annual certification, prepared and submitted by a professional engineer or environmental professional acceptable to NYSDEC, which

would certify that the institutional controls and engineering controls put in place are unchanged from the previous certification, and nothing has occurred that would impair the ability of the controls to protect public health or the environment or constitute a violation or failure to comply with any operation and maintenance or soil management plan.

8. The operation of the components of the remedy would continue until the remedial objectives have been achieved, or until the NYSDEC determines that continued operation is technically impracticable or not feasible. At the time of this determination, a workplan would be developed to perform a post-remediation evaluation of the effectiveness of the DPE system in eliminating potential exposure from sub-slab vapor impacts. Once the system is shut down, this evaluation of sub-slab vapor would be completed. If the evaluation indicates that contamination remains, mitigation would be necessary through a depressurization system. The DPE system under the building could be modified for that purpose.

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

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

- Repositories for documents pertaining to the site were established.
- A public contact list, which included nearby property owners, elected officials, local media and other interested parties, was established.
- A fact sheet was mailed on 2/23/04.
- A public meeting was held on 3/15/04 to present and receive comment on the PRAP.
- A responsiveness summary (Appendix A) was prepared to address the comments received during the public comment period for the PRAP.

TABLE 1A
Nature and Extent of Contamination
(January 1988-September 1994)

SUBSURFACE SOIL	Contaminants of Concern[a]	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	TCA	0.012-2.6	0.8	5 of 12
	1,1-DCA	0.007-0.19	0.2	0 of 12
	1,1-DCE	0.001-0.058	0.4	0 of 12

GROUNDWATER	Contaminants of Concern[a]	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
VOCs	TCA	ND(1)-2,800	5	15 of 42
	1,1-DCA	ND(5)-400	5	5 of 28
	1,1-DCE	ND(5)-110	5	3 of 28
	1,1,2-TCA	ND(5)	1	1 of 28
	1,2-DCA	4-23	0.6	1 of 28
	Chloroethane	ND(5)-16	5	1 of 28
	1,2-DCE	ND(5)-12	5	1 of 28
	TCE	ND(5)-13	5	4 of 28
	Toluene	ND(5)	5	0 of 28
	Vinyl Chloride	ND(10)	2	0 of 28
	Phenol	ND(5)-540	5	5 of 33

SURFACE WATER	Contaminants of Concern[a]	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
VOCs	TCA	ND(1)-33	5	4 of 9

SOIL GAS	Contaminants of Concern[a]	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Number of Samples
VOCs	VOCs	3-1,000	None	35

[a] ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;
ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
ug/m^3 = micrograms per cubic meter;
1,000 for the soil-gas contaminant range represents the upper limit of the meter used to record the data;
ND = "non-detect", with the lowest or highest detection limit for the summarized data shown in the parenthesis following "ND", depending on whether the ND represents the low end or the high end of the range of contaminant values, respectively. For policy and consistency purposes, an ND reading is never counted as an SCG exceedance, even if the detection limit is higher than the SCG value. Similarly, where the lowest estimated contaminant value is lower than the lowest detection limit, the lowest estimated contaminant value is used for the low end of the contaminant value range.
TCA = 1,1,1-Trichloroethane;
1,1-DCA = 1,1-Dichloroethane;
1,1-DCE = 1,1-Dichloroethene;
1,1,2-TCA = 1,1,2-Trichloroethane;
1,2-DCA = 1,2-Dichloroethane;
1,2-DCE = trans-1,2-Dichloroethene &/or cis-1,2-Dichloroethene;
TCE = Trichloroethene.

[b] SCG = standards, criteria, and guidance values. Note that no SCG for soil-gas has been established statewide.

TABLE 1B
Nature and Extent of Contamination
(August 1998-December 2002)

SUBSURFACE SOIL	Contaminants of Concern[a]	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	TCA	0.013-960	0.8	8 of 30
	1,1-DCA	ND(0.010)-4.9	0.2	1 of 30
	1,1-DCE	ND(0.010)-2.6	0.4	1 of 30
	1,2-DCA	ND(0.011)-ND(0.058)	0.1	0 of 30
	Benzene	ND(0.011)-0.5	0.06	1 of 30

GROUNDWATER	Contaminants of Concern[a]	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
VOCs	TCA	ND(10)-50,000	5	11 of 29
	1,1-DCA	ND(10)-5,400	5	10 of 29
	1,1-DCE	ND(10)-600	5	6 of 29
	1,1,2-TCA	ND(10)-12	1	3 of 29
	1,2-DCA	ND(10)-87	0.6	4 of 29
	Chloroethane	ND(10)-1,400	5	5 of 29
	1,2-DCE	ND(10)-21	5	4 of 29
	TCE	ND(10)-28	5	3 of 29
	Toluene	0.001-16	5	1 of 29
	Vinyl Chloride	2-7.5	2	2 of 29

SURFACE WATER	Contaminants of Concern[a]	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
VOCs	TCA	ND(10)	5	0 of 4

SOIL GAS	Contaminants of Concern[a]	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Number of Samples
VOCs	VOCs	0-3,041	None	133

INDOOR AIR	Contaminants of Concern[a]	Concentration Range Detected (μg/m³)[a]	SCG[b]/ Indoor Air[c] (μg/m³)[a]	Frequency of Exceeding SCG
VOCs	TCA	11.1-1,778	2.4-6.7	3 of 3

[a] ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;
ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
ug/m³ = micrograms per cubic meter;
ND = "non-detect", with the lowest or highest detection limit for the summarized data shown in the parenthesis following "ND", depending on whether the ND represents the low end or the high end of the range of contaminant values, respectively. For policy and consistency purposes, an ND reading is never counted as an SCG exceedance, even if the detection limit is higher than the SCG value. Similarly, where the lowest estimated contaminant value is lower than the lowest detection limit, the lowest estimated contaminant value is used for the low end of the contaminant value range.

TCA = 1,1,1-Trichloroethane;
1,1-DCA = 1,1-Dichloroethane;
1,1-DCE = 1,1-Dichloroethene;
1,1,2-TCA = 1,1,2-Trichloroethane;
1,2-DCA = 1,2-Dichloroethane;
1,2-DCE = trans-1,2-Dichloroethene &/or cis-1,2-Dichloroethene;
TCE = Trichloroethene.

[b] SCG = standards, criteria, and guidance values. Note that no SCG for soil-gas has been established statewide.

[c] Indoor air SCG's are based on the New York State Department of Health Database (NYSDOH Database) which is a summary of indoor and outdoor air sample results in control homes collected and analyzed by the NYSDOH from 1989 through 1996.

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost[1]	Annual OM&M	Total Present Worth
No Action	$41,600	$10,400	$77,150
Soil Vapor Extraction	$130,000	$37,800	$259,300
Bio-Remediation	$62,500	$32,800	$174,700
Dual Phase Extraction	$155,000	$47,800	$318,500
Capping	$60,000	$13,200	$105,150

1. The Capital Cost (except for the "no action" alternative) includes: $6,000 for three new bedrock wells, first-year monitoring costs of $46,000 for four (quarterly) groundwater sampling events at 16 on-site wells, and $3,000 for two (baseline plus annual) soil gas sampling events; while the Capital Cost for the "no action" alternative includes first-year monitoring costs of $41,600 for four (quarterly) groundwater sampling events at 13 on-site wells only.

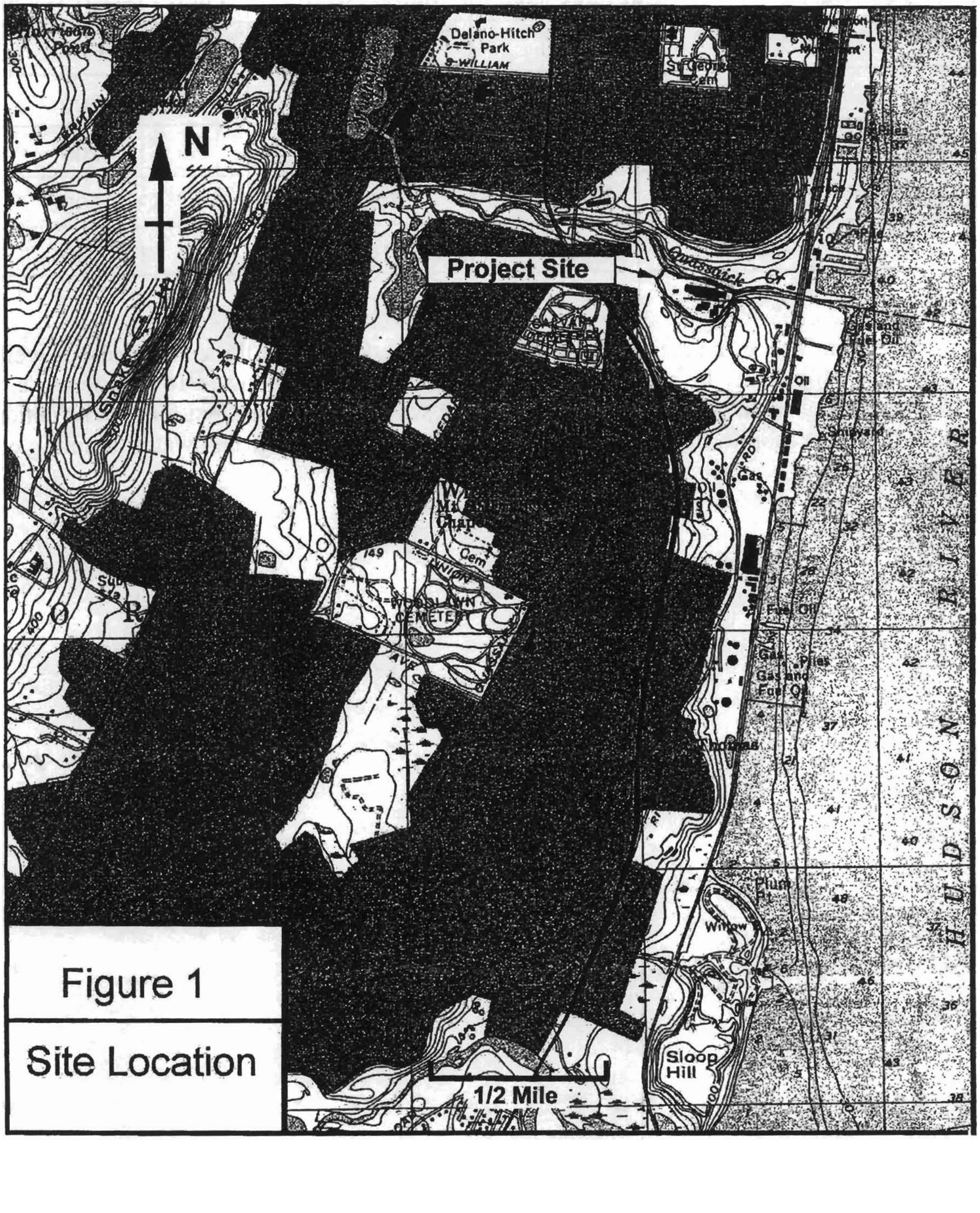
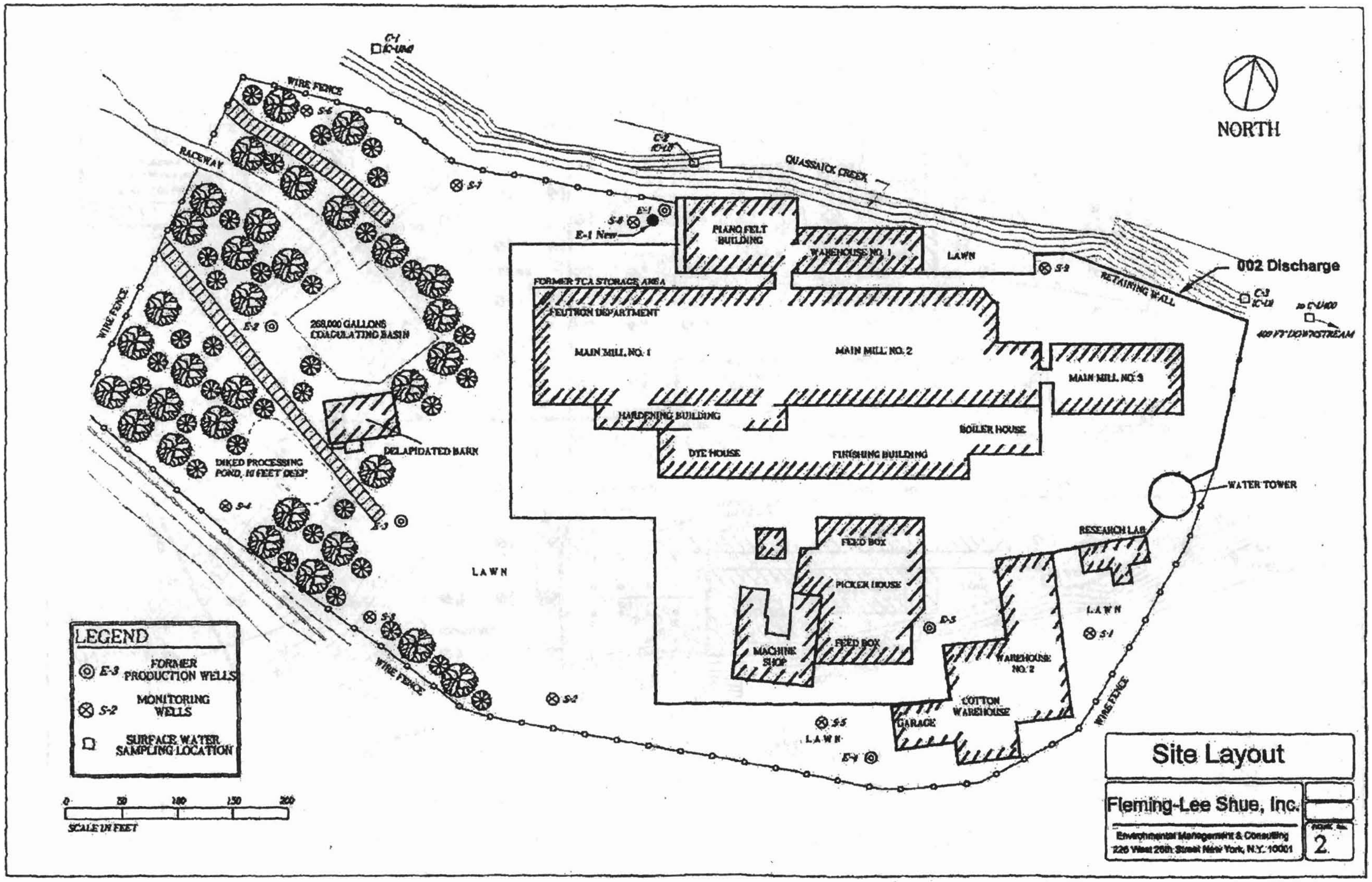
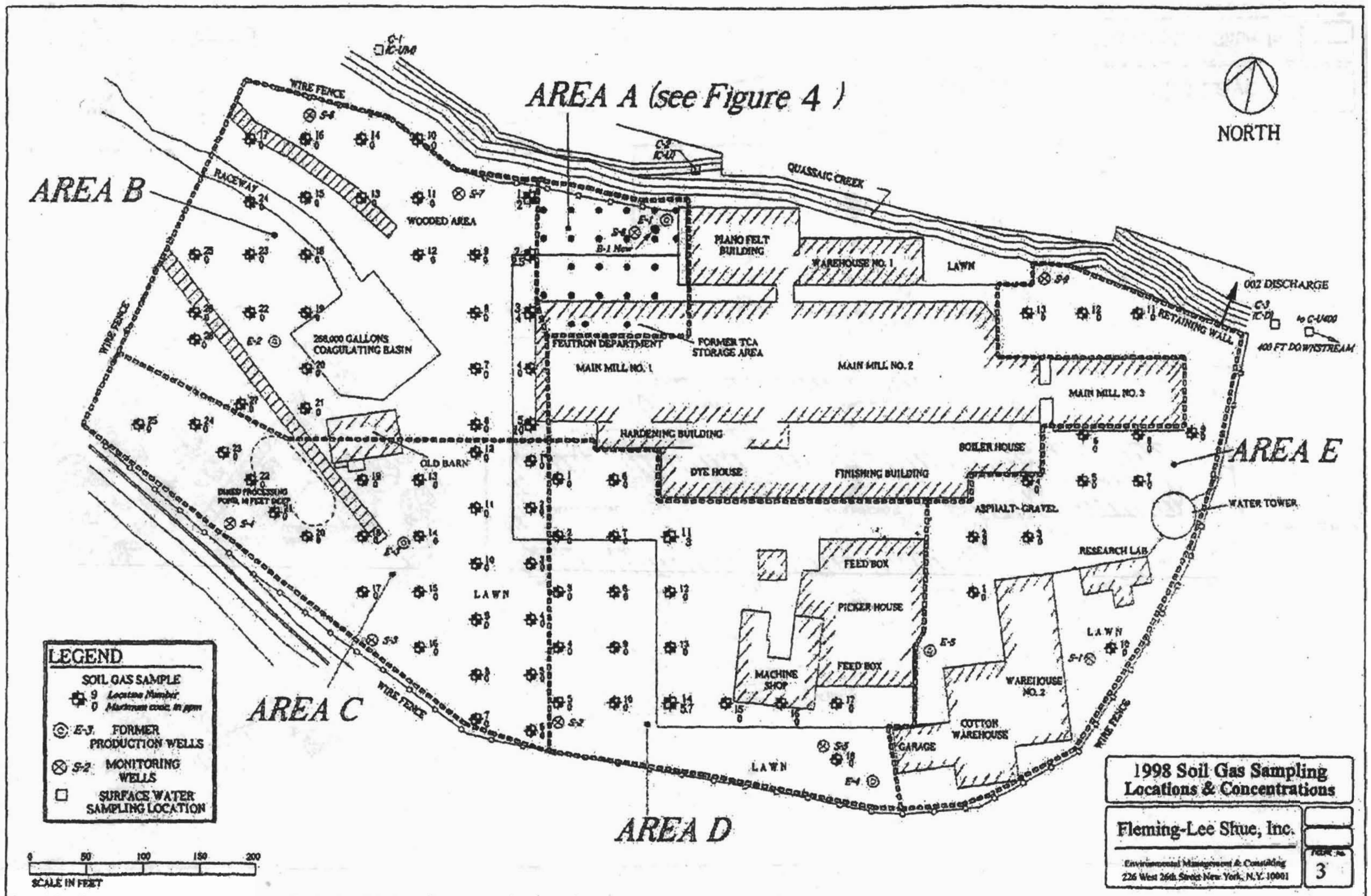
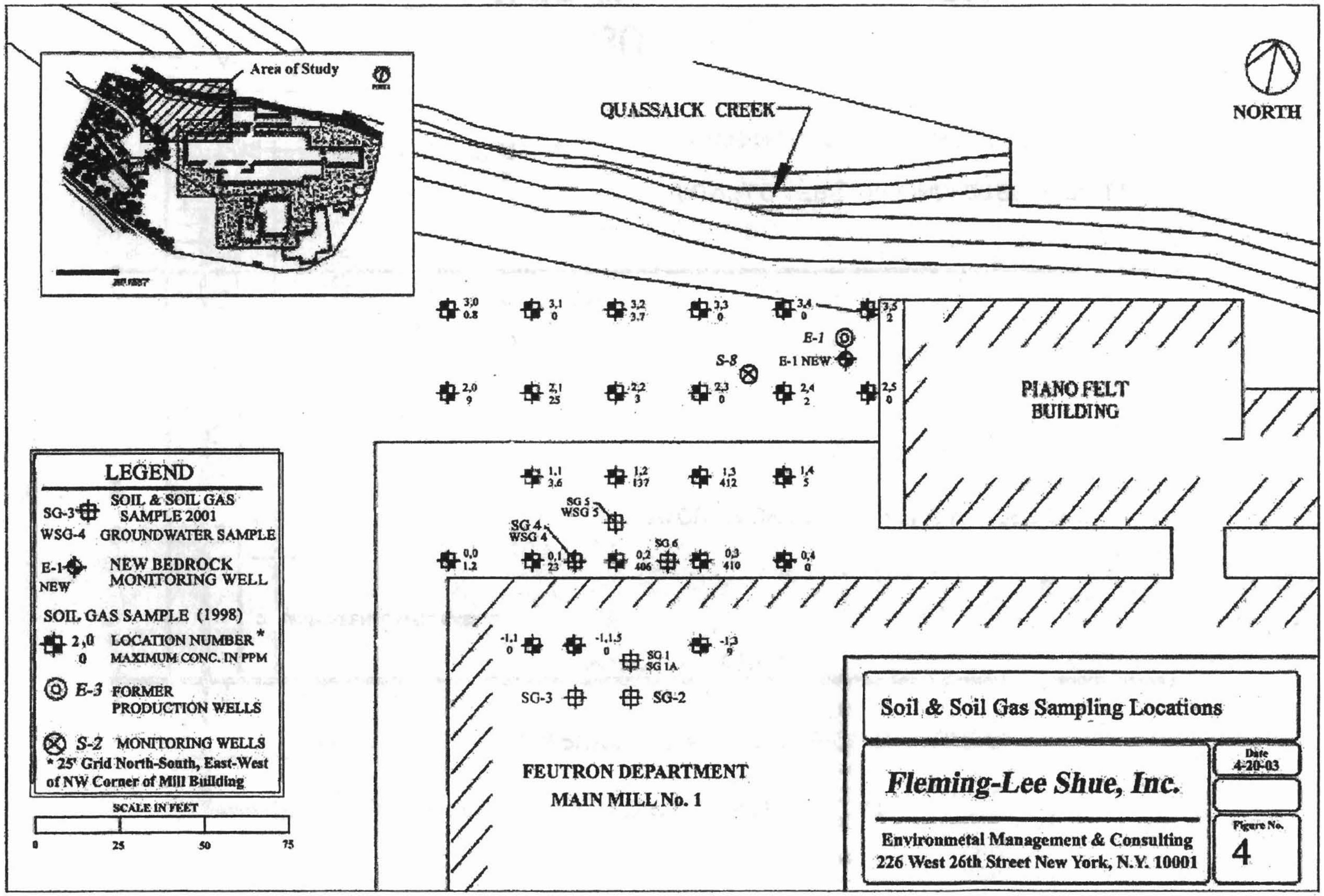


Figure 1

Site Location


NORTH
QUASSAICK CREEK
WIRE FENCE
RACEWAY
C-1
C-2
C-3
S-1
S-2
S-3
S-4
S-5
S-6
S-7
S-8
E-1
E-1 New
E-2
E-3
E-4
E-5
PIANO FELT BUILDING
WAREHOUSE NO. 1
LAWN
002 Discharge
RETAINING WALL
400 FT DOWNSTREAM
FORMER TCA STORAGE AREA
FEUTRON DEPARTMENT
MAIN MILL NO. 1
MAIN MILL NO. 2
MAIN MILL NO. 3
HARDENING BUILDING
BOILER HOUSE
DYE HOUSE
FINISHING BUILDING
WATER TOWER
280,000 GALLONS COAGULATING BASIN
DELAPIDATED BARN
DIKED PROCESSING POND, 10 FEET DEEP
RESEARCH LAB
FEED BOX
PICKER HOUSE
MACHINE SHOP
WAREHOUSE NO. 2
COTTON WAREHOUSE
GARAGE
LEGEND
E-3 FORMER PRODUCTION WELLS
S-2 MONITORING WELLS
SURFACE WATER SAMPLING LOCATION
0 50 100 150 200
SCALE IN FEET
Site Layout
Fleming-Lee Shue, Inc.
Environmental Management & Consulting
226 West 26th Street New York, N.Y. 10001
2


AREA A (see Figure 4)
AREA B
AREA C
AREA D
AREA E
NORTH
QUASSAIC CREEK
WIRE FENCE
RACEWAY
WOODED AREA
250,000 GALLONS COAGULATING BASIN
OLD BARN
PIANO FELT BUILDING
WAREHOUSE NO. 1
LAWN
FELTRON DEPARTMENT
FORMER TCA STORAGE AREA
MAIN MILL NO. 1
MAIN MILL NO. 2
MAIN MILL NO. 3
HARDENING BUILDING
DYE HOUSE
FINISHING BUILDING
BOILER HOUSE
ASPHALT- GRAVEL
FEED BOX
PICKER HOUSE
MACHINE SHOP
WAREHOUSE NO. 2
COTTON WAREHOUSE
GARAGE
RESEARCH LAB
WATER TOWER
RETAINING WALL
002 DISCHARGE
400 FT DOWNSTREAM
LEGEND
SOIL GAS SAMPLE
FORMER PRODUCTION WELLS
MONITORING WELLS
SURFACE WATER SAMPLING LOCATION
SCALE IN FEET
0
50
100
150
200
1998 Soil Gas Sampling Locations & Concentrations
Fleming-Lee Shue, Inc.
226 West 26th Street New York, N.Y. 10001
3



Area of Study
QUASSAICK CREEK
NORTH
3,0 0.8
3,1 0
3,2 3.7
3,3 0
3,4 0
3,5 2
E-1
E-1 NEW
S-8
2,0 9
2,1 25
2,2 3
2,3 0
2,4 2
2,5 0
PIANO FELT BUILDING
1,1 3.6
1,2 137
1,3 412
1,4 5
SG 5 WSG 5
SG 4 WSG 4
SG 6
0,0 1.2
0,1 23
0,2 406
0,3 410
0,4 0
-1,1 0
-1,1.5 0
SG 1 SG 1A
-1,3 9
SG-3
SG-2
FEUTRON DEPARTMENT
MAIN MILL No. 1
LEGEND
SG-3 SOIL & SOIL GAS SAMPLE 2001
WSG-4 GROUNDWATER SAMPLE
E-1 NEW NEW BEDROCK MONITORING WELL
SOIL GAS SAMPLE (1998)
2,0 0 LOCATION NUMBER * MAXIMUM CONC. IN PPM
E-3 FORMER PRODUCTION WELLS
S-2 MONITORING WELLS
* 25' Grid North-South, East-West of NW Corner of Mill Building
SCALE IN FEET
0 25 50 75
Soil & Soil Gas Sampling Locations
Fleming-Lee Shue, Inc.
Environmetal Management & Consulting
226 West 26th Street New York, N.Y. 10001
Date 4-20-03
Figure No. 4

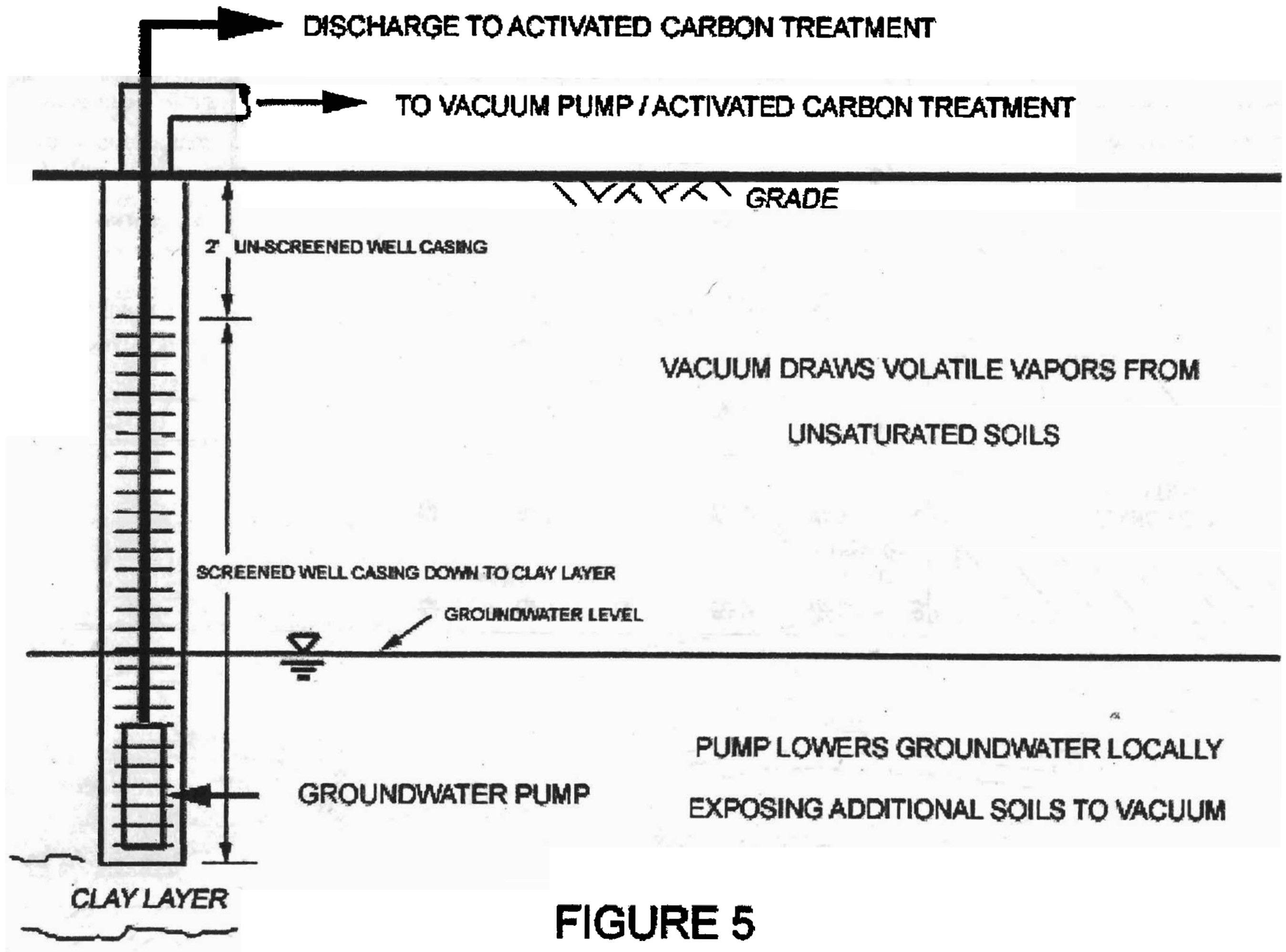
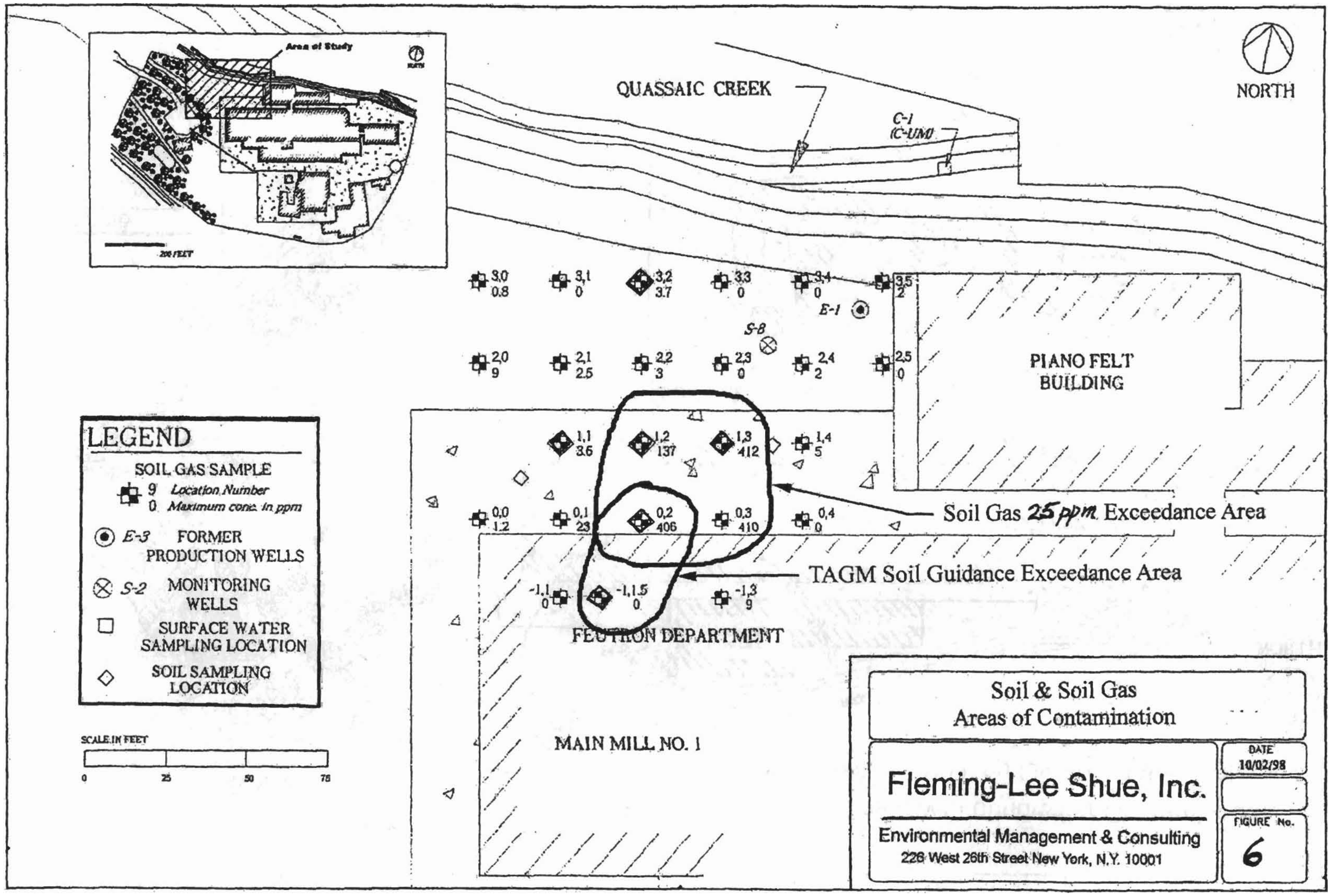
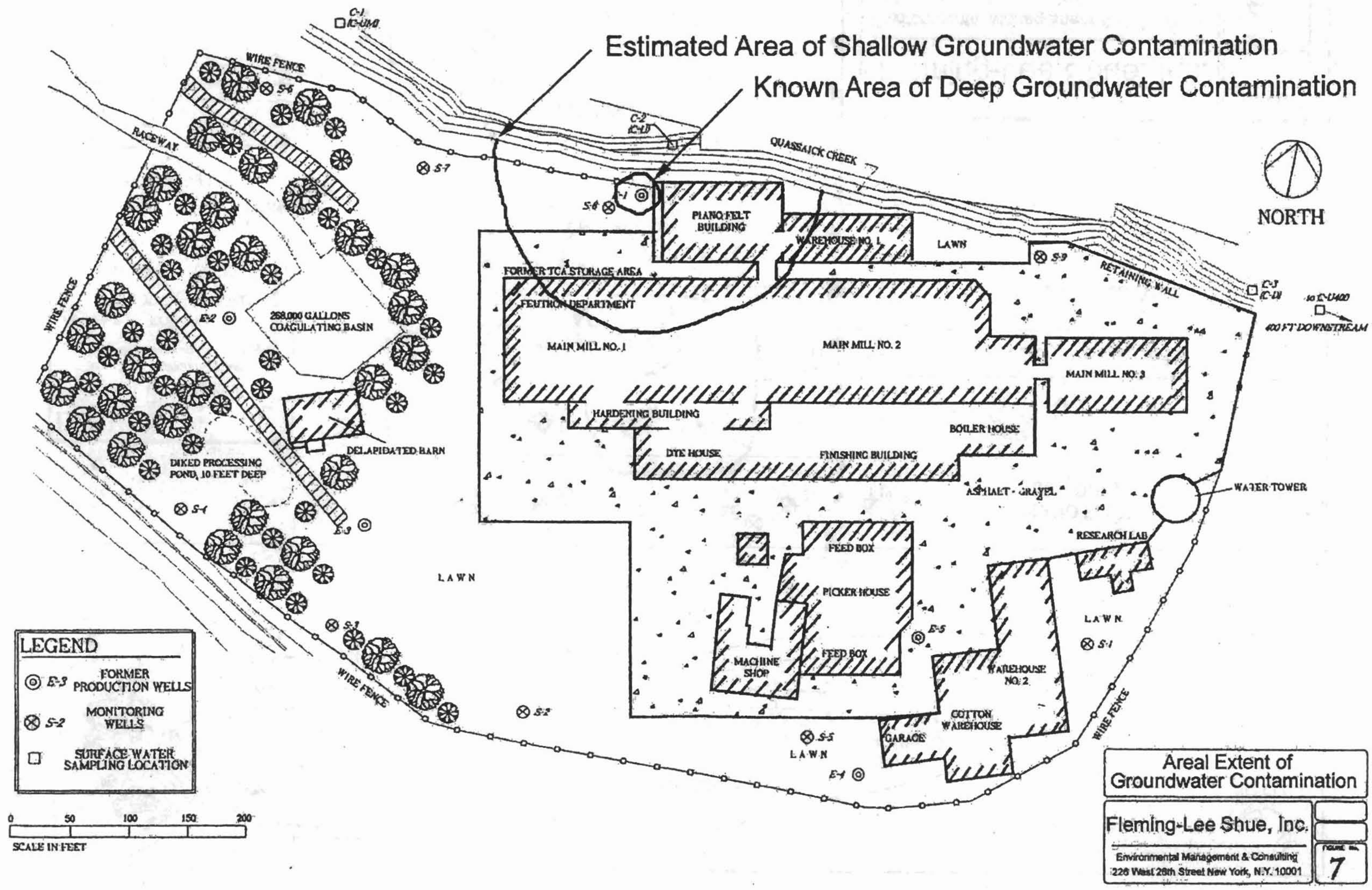


FIGURE 5
DUAL PHASE EXTRACTION SYSTEM


Area of Study
200 FEET
QUASSAIC CREEK
NORTH
C-1
(C-UM)
3,0
0.8
3,1
0
3,2
3.7
3,3
0
3,4
0
3,5
2
E-1
S-8
2,0
9
2,1
2.5
2,2
3
2,3
0
2,4
2
2,5
0
PIANO FELT
BUILDING
1,1
3.6
1,2
137
1,3
412
1,4
5
0,0
1.2
0,1
23
0,2
406
0,3
410
0,4
0
-1,1
0
-1,1.5
0
-1,3
9
Soil Gas 25 ppm Exceedance Area
TAGM Soil Guidance Exceedance Area
FEUTRON DEPARTMENT
MAIN MILL NO. 1
LEGEND
SOIL GAS SAMPLE
9 Location Number
0 Maximum conc. in ppm
E-3 FORMER PRODUCTION WELLS
S-2 MONITORING WELLS
SURFACE WATER SAMPLING LOCATION
SOIL SAMPLING LOCATION
SCALE IN FEET
0
25
50
75
Soil & Soil Gas
Areas of Contamination
Fleming-Lee Shue, Inc.
Environmental Management & Consulting
226 West 26th Street New York, N.Y. 10001
DATE
10/02/98
FIGURE No.
6



Areal Extent of Groundwater Contamination

Fleming-Lee Shue, Inc.

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226 West 26th Street New York, N.Y. 10001

FIGURE No. 7

APPENDIX A

Responsiveness Summary

RESPONSE 2:

The area of this easement would be limited to the area defined by the perimeter of the site. Therefore, off-site properties would not be included within this easement.

COMMENT 3:

You are calling for three new bedrock wells. Will you be sealing up the old wells?

RESPONSE 3:

The wells will be evaluated by the Site Management Plan (SMP) for closure at some point in the future.

COMMENT 4:

Any idea of the cost of the investigation to the PRP? What is the estimated cost of the proposed remedy?

RESPONSE 4:

The information provided by the PRP's consultant indicates that the various studies and reports associated with the site have cost the PRP about $1,000,000 thus far. The implementation of the provisions of this ROD is estimated to cost an additional $318,500.

COMMENT 5:

Will the PRP pay for the remedy as well? If the superfund pays for the cleanup, will the NYSDEC try to collect the money from the PRP?

RESPONSE 5:

The PRP is expected to pay for and implement the remedy. However, state Superfund money could be used to implement the remedy if the PRP does not enter into an order on consent, and implement the remedy. In such a case, the NYSDEC would start proceedings to recover the costs that the State has incurred.

COMMENT 6:

Have there been other chemicals picked up in the monitoring wells beyond TCA?

RESPONSE 6:

Yes, other volatile organic compounds besides TCA have been found in the monitoring wells, some of which (e.g., 1,1-DCA and 1,2-DCA) are "breakdown components of TCA. However, TCA is the primary contaminant found in the wells.

COMMENT 7:

There is a school within about 1,000 feet of this site. Would there be any danger to them when the soil vapor is extracted from the ground?

RESPONSIVENESS SUMMARY

American Felt & Filter Company
Site No. 3-36-036
March 2004

The Proposed Remedial Action Plan (PRAP) for the American Felt & Filter Company site, was prepared by the New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on 2/23/04. The PRAP outlined the remedial measure proposed for the contaminated soil, groundwater and indoor air at the American Felt & Filter Company site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on 3/15/04, which included a presentation of the Remedial Investigation (RI) and the Feasibility Study (FS) as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on 3/24/04.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the NYSDEC's responses:

COMMENT 1:
This property is on the boundary of the Town and the City of Newburgh. Did you investigate any off-site contamination from this site?

RESPONSE 1:
The off-site investigation was limited to an inventory of private wells within a half-mile radius of the site. One private well was found; however, this shallow well is not downgradient of the site, and the trace TCA contamination found in this well was not found during a subsequent sampling event. Nevertheless, three new bedrock wells will be located at the eastern perimeter of the site and off-site as needed to ascertain the extent of off-site contamination of groundwater, if any.

COMMENT 2:
The remedy calls for a groundwater easement. What would be the area of this easement? Would it include off-site properties as well?

RESPONSE 7:
No. Contaminants in the soil vapor will be filtered out of the air collected by the remedial (DPE) system via granular activated carbon before being vented to the atmosphere.

COMMENT 8:
With the soil management plan, if contaminated soil is excavated later, how do we know that it will be disposed of properly? Will it need to be treated? Where will it go?

RESPONSE 8:
The SMP will require that NYSDEC be notified of any activity that requires soil excavation, and that the property owner will certify annually that any soil excavation activities were completed in accordance with the SMP. The SMP will ensure that the excavated soil is characterized and, if appropriate, disposed of or treated at a permitted facility in accordance with all applicable state and federal regulations.

COMMENT 9:
What is TCA and what are the health dangers associated with it?

RESPONSE 9:
TCA is a volatile organic compound. It is a colorless liquid with a sharp, sweet odor; and is found in many common products, such as glue, paint, industrial degreasers, and aerosol sprays. TCA is also used as a solvent for textile processing and dyeing, as an "intermediate" in the manufacture of organic chemicals, and as a coolant and lubricant in metal cutting oils. Agricultural uses of TCA include post-harvest fumigation of strawberries, de-greening of citrus fruits, and as a solvent for various insecticides. TCA may cause liver, nervous system and/or circulatory system damage if inhaled or ingested in large amounts. Additional information regarding TCA is available at the following website: www.atsdr.cdc.gov.

COMMENT 10:
How long will it take for the remedy to get the soil and groundwater cleaned up?

RESPONSE 10:
The amount of time that it will take to clean up the soil and groundwater to meet SCGs could vary, depending on a number of variables, such as the extent of bedrock groundwater contamination and the amount of contaminated soil that becomes amenable to soil vapor extraction. Based upon our present understanding of the site, a minimum of two years is estimated for the operation of the DPE system.

COMMENT 11:
Has there been a health assessment of the prior employees who worked at this site?

RESPONSE 11:

No. The NYSDEC and NYSDOH are not aware of any assessment having been conducted.

COMMENT 12:

Has the air ever been checked inside the building?

RESPONSE 12:

Yes, three air samples were collected inside the main building during December, 2002. The results have been summarized in Section 5.1.3 and Table 1B.

COMMENT 13:

How would the air be checked? If the NYSDOH doesn't do it, but relies on the PRP's consultant to take the samples, how do they know that the results are accurate?

RESPONSE 13:

The air sampling procedure is done under regulatory oversight, and the air samples are sent to a lab approved and certified by the NYSDOH.

COMMENT 14:

How did this site come to the attention of the NYSDEC?

RESPONSE 14:

The USEPA found TCA in a site-related discharge into the Quassaick Creek in 1987, and notified the NYSDEC's Division of Water. The site was eventually referred to NYSDEC's Divsion of Environmental Remediation.

COMMENT 15:

When was the site put in the Registry?

RESPONSE 15:

The site was listed in the NYSDEC Registry of Inactive Hazardous Waste Disposal Sites during 1991.

COMMENT 16:

By my estimate, it has taken 14 years for the site to get to this stage. Why has it taken so long, and was the public exposed to TCA going into the air all that time?

RESPONSE 16:

The Remedial Investigation under the Consent Order actually took six years. However, it took 10 years of negotiation to get the PRP to sign the Consent Order, during which time the PRP was unilaterally conducting investigations at the site (see Response 17 also).

COMMENT 17:

This region has cancer clusters and notoriously bad air conditions. Didn't the TCA going into the air make matters worse?

RESPONSE 17:
The NYSDOH Cancer Surveillance Improvement Initiative provides information about cancer incidences in communities across New York State (see www.health.state.ny.us). Information regarding cancer incidents in the same zip code area as the site indicate that the number of observed cancers are within or below the number of cancers one would expect to see. We do not believe that TCA entered the air at levels that would be of a health concern to the surrounding community.

COMMENT 18:
I'm confused because the NYSDEC says this site meets the definition of a Class 2 site, and yet the NYSDOH doesn't seem to think that there is a serious problem here.

RESPONSE 18:
Under certain potential or completed exposure scenarios, the threat posed by the contamination at the site could be significant - hence the Class 2 designation. While, based on the site investigation and current site conditions, there are no completed human health exposures at this site at this time, the potential for such exposures exists without remediation. In addition, a significant environmental exposure also exists, in the form of the contravention of groundwater standards.

COMMENT 19:
There is another site in this area called the "Clean Earth" site. Soil was excavated and just left to sit. Now, many years later, the NYSDEC says that most of the "hot spots" are gone. If nothing was done at the AF&F site, would it also clean itself up over time?

RESPONSE 19:
Natural attenuation of TCA concentration can occur when the contaminated soil is aerated during excavation or spread on the ground surface, or when conditions are suitable for biodegradation of the contamination by bacterial activities. Neither of these two modes of attenuation appear to be a major factor at the site.

COMMENT 20:
You point out that contamination is in the deep bedrock well. Can't contamination be coming from the sump area inside the main building?

RESPONSE 20:
The thick layer of till overlying the bedrock and the artesian condition generally prevailing in the bedrock aquifer act as impediments to the flow of contaminants into the bedrock. Historical data suggest that it is more likely that the contaminant was drawn into the bedrock because of the operation of the deep supply well E-1.

COMMENT 21:

What is the contaminant concentration in the shallow aquifer versus the bedrock aquifer?

RESPONSE 21:
The TCA contaminant concentration in the overburden aquifer is about 50 times less than that in the bedrock aquifer, in the vicinity of monitoring wells S-8 and E-1 New, respectively. The TCA concentrations in these wells were 9.8 ppb in S-8 (overburden aquifer) and 550 ppb in E-1 New (bedrock aquifer) during the most recent (11/01) sampling event.

COMMENT 22:
Would the contamination at this site ever get into the Hudson River?

RESPONSE 22:
Minor amounts of site-related contamination have been recorded in the Quassaick Creek. However, it is unlikely that site-related contamination reaches the Hudson River in appreciable concentration, given the evaporative nature of TCA.

COMMENT 23:
The NYSDEC and the Governor have been very supportive of the "Quassaick Creek Project". How often has the creek been tested at this site?

RESPONSE 23:
Four sampling events have resulted in 13 surface water samples from four different creek locations during the past 16 years.

COMMENT 24:
With over 800 sites on the State Registry, and personnel cuts at the NYSDEC, how can we believe that the NYSDEC will be "making sure" that the remedy is implemented and enforced over a period of years?

RESPONSE 24:
The NYSDEC is committed to providing adequate oversight to this project and ensuring that the remedy is implemented in a timely manner. The remedy for the site requires an annual certification by the property owner as described in Section 8, item 7.

COMMENT 25:
If citizens see pollution happening, how do we let the NYSDEC know about it?

RESPONSE 25:
Citizens can call the NYSDEC Spill Hotline at 1-800-457-7362; the 1-800-TIPPDEC (1-800-847-7332) Hotline; or the NYSDEC Environmental Conservation Officer dispatch desk at 845-256-3013.

COMMENT 26:
When will we know when a decision is finally reached?

RESPONSE 26:
It is expected that the ROD will be issued by the end of March. Once it is signed, it will be placed in the local Document Repositories and a "Notice of ROD Availability" will be sent to all parties on the site's mailing list, which includes those parties present at the public meeting.

COMMENT 27:
The efficiency of the DPE system depends on its ability to lower the groundwater table. Are the conditions at the site suitable for this system?

RESPONSE 27:
Extraction of groundwater can affect the groundwater table in two ways: by creating a cone of influence locally around the recovery well as would be found in low permeability soils, or by generally lowering the ground water table over a larger area as would be found in permeable soils. One other major factor that would affect the lowering of the groundwater table would be the rate at which the aquifer is recharged.

If a lowering of the ground water table is not achieved with the DPE system and a satisfactory rate of reduction in the contaminant concentrations in the soil and groundwater is not achieved, consideration will given to converting the DPE system to an air-sparging/SVE system. Indoor air quality will be monitored if this conversion is implemented.

The following comments were received in a letter dated March 15, 2004 from Ms. Susan Cleaver:

COMMENT 28:
Has an inventory been done of all the pipes and discharge points from this facility into the Quassaick Creek? Shouldn't all of the discharge points be indicated on a map, and shouldn't they be blocked to prevent possible seepage into the creek? Isn't the creek a floodway?

RESPONSE 28:
The Quassaick Creek is a natural floodway for its catchment area (an important function of many of the drainage basins that discharge into the Hudson River). Based upon periodic surface water monitoring of the Quassaick Creek, the discharge of TCA into the creek has been decreased to a level that meets both surface water guidance values as well as groundwater standards. An inventory of process and stormwater discharge points from the site to the creek was done by the USEPA in 1987. The "002" discharge (see Figures 2 and 3) is covered under the SPDES permit for this site. Permitted pollution control units and other operating appurtenances are subject to periodic inspections by the NYSDEC and are outside the purview of the State Superfund program. The next inspection of the site by the NYSDEC is toward the end of March, 2004.

COMMENT 29:
Are there any effluent connections from the site to an underground storm drain-tunnel? If so, is this shown on a map, and is this a possible exposure pathway?

RESPONSE 29:
The catch-basins at the site drain stormwater to the Quassaick Creek. The process & sanitary water at the site are piped to the Town of New Windsor's sewage treatment system. There are no exposure pathways associated with flow of effluent through drain-tunnel or pipework. Also see response to Comment 1 above.

COMMENT 30:
Shouldn't a list of emergency contacts be available for contaminant exceedances recorded during sampling events?

RESPONSE 30:
Contaminant exceedances recorded during sampling events are not expected to rise to the level of an emergency. Of course, should an emergency arise at this or any other location, a coordinated emergency response would be undertaken.

The following comment was received on March 22, 2004 in an undated letter from Mr. Samuel Sloan, Jr.:

COMMENT 31:
"When I was a young boy about 12 years old in 1929, we used to play in the area close to the American Felt and Filter plant. There was a runaway (sic) that ran along the south side of Quassaick Creek from the factory to the Hudson River. This was a very dark color. As young kids, we stayed away from it. I thought you might be interested in this."

RESPONSE 31:
The raceway is no longer in use, and the remains of the raceway are dry.

The following comment was received in a letter dated March 21, 2004 from Mr. Wilson Pryne:

COMMENT 32:
"We are writing to request that the Remedial Action Plan that you include in the ROD not restrict the potential future use of the site to only industrial or commercial uses."

RESPONSE 32:
This project was initiated as a focused investigation of the nature and extent of the groundwater contamination which was the basis for the site listing. As an operating manufacturing facility, a commercial/industrial property, all possible impacts from this use were not included in the scope of the

investigation and the remedies evaluated also retained this focus. Therefore, no change will be made to the Commercial/Industrial restriction included in the ROD. If a change to residential use for the property is requested in the future, then additional investigation and remediation may be needed to allow such use.

The following comments were received in a letter dated March 24, 2004 from Mr. Terry Hughes:

COMMENT 33:
The PRAP does not discuss the daughter products of 1,1,1-TCA in an oxygen-deficient environment, nor does it give any data on the concentrations found of TCE or ethylene dichloride, both of which are generally considered a greater public health danger than the relatively innocuous 1,1,1-TCA. Their presence in the deep rock aquifer should not modify the proposed plan, since there is no public health danger in the deep rock aquifer. However, it should be made clear that their presence at levels greater than state groundwater standards is part of the remediation standard.

RESPONSE 33:
Tables 1A and 1B in the PRAP and ROD show that while the TCA contaminants in the soil at the site have exceeded the soil guideline or SCG for TCA, the TCE and ethylene dichloride (1,2-DCA) contaminants have not exceeded their respective soil guidelines. Also, the maximum concentrations of TCA in the groundwater (as shown in Tables 1A and 1B) are more than 1,000 times greater than the maximum concentrations of TCE and ethylene dichloride (1,2-DCA), respectively. Since the remedy is
designed to recover the contamination and remove it from the environment, there will be a proportionate reduction in the residual concentrations of daughter products and other VOCs. Moreover, the DPE system exposes a larger expanse of the soils to air and thereby, in some measure, reduces the breakdown of TCA into daughter products.

COMMENT 34:
What is the value of the soil gas surveys? If the standard is groundwater concentrations(s) of specific chemical compounds in the underlying aquifers, then the soil gas surveys are only of value concerning the presence of chlorinated solvents in the unsaturated zone. However, if the soil gas surveys are to be used to determine when the remedial system can be shut down for "rebound" and restart, then they could be cost-effective.

RESPONSE 34:
The soil gas surveys are a cost-effective way to assess the effectiveness of the DPE system, as well as to assess the potential for indoor air contamination. The data collected may also be used for determining the pulsing frequency as suggested in the comment.

COMMENT 35:
Will the soil-gas surveys and the remedial system continue to run when the data shows that there is no

more contamination in the unsaturated zone, but the chlorinated compound concentrations are still higher than the state groundwater standards in the bedrock aquifer? The ROD should make clear that, at this point, natural attenuation should be the remedial alternative. As one who has worked for both private companies and the NYSDEC, my view is that doing costly site remediation where risk analysis shows public health dangers to be minimal, as here, is not warranted as a matter of public policy.

RESPONSE 35:

The last bullet in Section 1 of the ROD states that "operation and maintenance of the components of the remedy (shall continue) until the remedial objectives have been achieved, or until the NYSDEC determines that continued operation is technically impracticable or not feasible. At the time of this determination, a workplan would be developed to perform a post-remediation evaluation of the effectiveness of the DPE system in eliminating potential exposure from sub-slab vapor impacts. Once the system is shut down, this evaluation of sub-slab vapor would be completed. If the evaluation indicates that contamination remains, mitigation of contamination would be necessary through a depressurization system. The DPE system under the building could be modified for that purpose."

APPENDIX B

Administrative Record

Administrative Record

American Felt & Filter Company
Site No. 3-36-036

1. Proposed Remedial Action Plan for the American Felt & Filter Company site, dated February 2004, prepared by the NYSDEC.

2. Order on Consent, Index No. W3-0784-96-05, between NYSDEC and the American Felt & Filter Company, executed on 3/31/98.

3. "Remedial Investigation Report and Feasibility Study", October 2003, prepared by Arnold F. Fleming, P.E.

4. "Meeting Invitation and Fact Sheet", February 2004.

5. Letter dated 3/15/04 from Susan Cleaver.

6. Letter (undated) received on 3/22/04 from Samuel Sloan, Jr.

7. Letter dated 3/21/04 from Wilson Pryne.

8. Letter dated 3/24 from Terry Hughes.