Department of Environmental Conservation

Division of Hazardous Waste Remediation

Record of Decision

Swivelier Company
Village of Nanuet, Rockland County
Site Number 344036

MARCH 1996

Funded Under the
1986 Environmental Quality Bond Act

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* MICHAEL D. ZAGATA, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

SWIVELIER COMPANY INACTIVE HAZARDOUS WASTE SITE
VILLAGE OF NANUET, ROCKLAND COUNTY, NEW YORK
SITE NO. 344036

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the Swivelier Company inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law (ECL). The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CRF300).

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

Assessment of the Site

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

Description of Selected Remedy

Based on the results of the Remedial Investigation/Feasibility Study (RI/FS) for the Swivelier Company site and the criteria identified for evaluation of alternatives, the NYSDEC has selected Alternative G-1 (no action, deed restrictions on future groundwater use and groundwater/surface water monitoring) and a combination of either S-2 and SD-2A (hot-spot excavation and off-site disposal of excavated soils and sediments) or S-3B and SD-2B (hot-spot excavation and on-site soil venting of unsaturated and saturated soils and sediments). Both off site and on-site options are being retained because the various screening criteria are comparable, including preliminary cost estimates. Once the detailed costs are evaluated in the remedial design, a final decision will be made as to the selected remedy. The components of the remedies are as follows:

- A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction; operation and maintenance; and monitoring of the remedial program.

- Saturated and unsaturated, soils and sediments will be excavated with a backhoe (or comparable equipment) and replaced with clean fill. Dust and erosion control measures will be employed to minimize any short-term impacts on human health or the environment from on-site contamination.

- Excavated soils and sediments will be handled using one of the following options:

  Option 1 - Soils and sediments which are determined to be hazardous wastes will be hauled off site to a disposal facility permitted to accept hazardous waste. Those materials which are not hazardous wastes will be either left on site or disposed at a permitted, solid waste facility.

  Option 2 - Soils and sediments will be treated on-site utilizing soil venting technology. Exhaust vapors will be treated with catalytic oxidation. Treated soils will be disposed at a permitted solid waste facility or left on site depending on residual contamination levels.

- Access and deed restrictions for future on-site groundwater use will be pursued to assure that human and environmental exposure pathways for groundwater (and surfacewater) are severely limited. A five-year monitoring plan for groundwater and surface water will be implemented to determine if the remedial actions (contaminated soil and sediment removal) are having the intended effect of helping to reduce impacts to groundwater, causing a decrease in groundwater (and surface water) contamination levels. In addition, monitoring for any off-site impacts is necessary to insure that the groundwater plume is not growing and/or moving off site. A groundwater monitoring well cluster will be installed to monitor potential off-site migration in a southwesterly direction. If the long-term monitoring program reveals off site impacts at levels which pose a concern, additional remedial options will be evaluated.

New York State Department of Health Acceptance

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

Declaration

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

3/28/96
Date

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

TABLE OF CONTENTS

RECORD OF DECISION

SWIVELIER COMPANY SITE
VILLAGE OF NANUET, ROCKLAND COUNTY, NEW YORK
SITE NO. 344036
MARCH 1996

SECTION 1: SITE LOCATION AND DESCRIPTION

The Swivelier Company Site (NYS Site Code No. 3-44-036) is located in southeastern Rockland County in the Town of Clarkstown, New York (Figure 1). The Swivelier Company, located at 33 Route 304, (Figure 2) manufactures track lighting fixtures in a 32,000 square foot industrial facility in an industrial/commercial area. The facility is located on a six-acre parcel and is largely surrounded by paved parking lots. The adjoining property line to the west is shared with Teplitz, an auto salvage facility which is known to contribute petroleum hydrocarbon contamination to the surrounding environment, including impacts to the Swivelier Property. The property lies adjacent to a small drainage ditch which flows southwest to the Nauraushaun Creek, which in turn flows south and discharges into Lake Tappan, 4.5 miles south-southeast of the site. Lake Tappan supplies drinking water to northern Bergen County, New Jersey. The site is located 4.3 miles west of the Hudson River. Topographically, the site displays little relief. According to a 1980 report, prior to the reconstruction of Route 304, the area west of the Swivelier facility was a small wetland area. In order to improve surface drainage, the New York State Department of Transportation (NYSDOT) created a shallow drainage ditch at this location, now a tributary to Nauraushaun Creek. Both the Nauraushaun Creek and this small tributary meander through largely developed areas in which several "potential" sources of contamination have been identified. The Spring Valley Company supplies public water to this area.

SECTION 2: SITE HISTORY

2.1 Operational/Disposal History

Swivelier is owned by Nathan R. Schwartz and is currently operated by Michael I. Schwartz, President of Swivelier. A portion of the site building is tenant-leased to several small retail businesses. Swivelier utilizes a portion of the site building for the assembly, manufacture, warehousing, and distribution of lighting fixtures. Swivelier has been an active manufacturing site since 1956.

Currently, site cooling and process water is recycled. In the past, however, all non-contact process wash and cooling waters, as well as wastewaters from the building floor drain system, were discharged through an underground pipe to a drainage ditch at the site. In 1979, the Rockland County Department of Health (RCDH) received a complaint from a local resident citing discolored water flowing in the drainage ditch at the Swivelier site. As a result, the Spring Valley Water Company (SVWC) collected a sample of the Swivelier pipe discharge waters and a surface water sample downgradient of the discharge outfall. Analytical results for the outfall pipe and surface water samples indicated a total volatile organic compound (VOC) level of 14,425 and 8,962 parts per billion (ppb), respectively, including detected concentrations of trichloroethene (TCE), tetrachloroethene (PCE), and methylene chloride. The primary constituent detected in both samples was TCE. In 1980, TCE and methylene chloride were eliminated from the Swivelier degreasing operation and replaced by a phosphate-based system, and site process and cooling water wastes were directed to the municipal sewer system rather than the discharge pipe to the site drainage ditch.

In early 1991, groundwater sampling of several area business and residential wells was conducted by the RCDH. TCE was detected at 5,400 ppb in a groundwater sample collected from a well spigot at the "L.A. Woman" nightclub located 0.4 miles south (and suspected downgradient) of the site. TCE was also detected at lower levels, but in exceedance of New York State Department of Health (NYSDOH) standards, in groundwater samples collected from other wells in the vicinity of L.A. Woman. These findings raised concerns regarding potential impacts to area drinking water.

In May 1991, the RCDH identified numerous potential sources (including Swivelier) of TCE groundwater contamination detected at the L.A. Woman non-community public water supply well. The RCDH recommended to the NYSDEC that Swivelier be listed on the New York State (NYS) Registry of Inactive Hazardous Waste Sites. Swivelier was added to the Registry in July 1991 as a Class 2 site. A Class 2 site presents a significant threat to the public health or environment and action is required. As a result, an RI/FS was conducted at the Swivelier site by Camp, Dresser and McKee (CDM), an environmental engineering consultant retained by the NYSDEC.

2.2 Remedial History

During the remedial investigation, two indoor, cement-lined floor pits were discovered in the warehouse portion of Joey's, a retail outlet for childrens clothing and one of the tenant-occupied portions of the Swivelier building. These pits were sampled and found to contain VOCs (primarily TCE and DCE) at levels exceeding 150 ppm. A subcontractor, Environmental Products and Services (EPS), was retained by CDM to conduct an Interim Remedial Measure (IRM) of the floor pit liquids and sludge materials. On December 19, 1995, approximately 1350 gallons of fluids and two drums of solids were removed off site and disposed of at a permitted facility.

SECTION 3: CURRENT STATUS

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

3.1 Summary of the Remedial Investigation

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

The RI was conducted in two phases. The first phase was conducted between June 1994 and August 1994 and the second phase between June 1995 and September 1995. A report entitled "Phase II Remedial Investigation and Phase III Feasibility Study Report (Volumes 1 and 2) of the Swivelier Company Site" has been prepared describing the field activities and findings of the RI in detail. The RI activities consisted of the following:

Major Investigative Tasks

- *Installation of soil borings and monitoring wells to determine the nature and extent of contamination in soils and groundwater. These data also assisted in the characterization of hydrogeologic conditions in the surficial and bedrock aquifers.*
- *Collection of soil gas samples to help define the nature and extent of shallow VOC contamination in soils adjacent to the source area and beneath the site building adjacent to the indoor floor pits.*
- *Surface water and sediment characterization to determine the nature and extent of contamination at the contaminant discharge area.*
- *Excavation of test pits to identify the location of the discharge pipe and evaluate the nature and extent of contamination in adjacent soils.*
- *In-situ permeability testing to determine the hydraulic properties of water-bearing soils adjacent to monitoring wells.*

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the analytical data obtained from the RI was compared to environmental Standards, Criteria, and Guidance (SCGs). Groundwater, drinking water and surface water SCGs identified for the Swivelier Company site were based on NYSDEC Ambient Water Quality Standards and

Guidance Values and Part V of the NYS Sanitary Code. For the evaluation and interpretation of soil and sediment analytical results, NYSDEC soil cleanup guidelines for the protection of groundwater, background conditions, and risk-based remediation criteria were used to develop remediation goals for soil.

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

Chemical concentrations are reported in parts per billion (ppb) and parts per million (ppm). For comparison purposes, SCGs are given for each medium. Table 1 presents a summary of representative contaminants and their concentrations for each media.

3.1.1 Soils

Soil samples collected during the remedial investigation were obtained during the installation of monitoring wells, soil borings, shallow excavations utilizing a backhoe as well as shallow hand augering. Contaminant levels proved to be most significant adjacent to the shallow discharge pipe which leads from the Swivelier building to the north-south trending drainage ditch which lies 80 feet west of the building (see Figure 3). Trichloroethene (TCE) was the primary solvent used in the Swivelier operations. Contaminants in soils include TCE and a breakdown product 1,2-Dichloroethene (1,2 DCE). The recommended soil cleanup objective for these contaminants ranges between 0.2 and 0.7 ppm. Levels were found to be highest in test pit samples (0 to 8 feet below ground surface) along the east bank of the drainage ditch where the discharge pipe ends. Total VOCs were as high as 235 ppm. A sludge sample from within the discharge pipe had total VOC levels of 152 ppm. Soil samples collected from monitoring wells adjacent to the discharge area showed slightly elevated total VOC levels in the 1 to 3 ppm range. Elsewhere, soils were not impacted or only slightly impacted with levels significantly less than 1 ppm. The exceptions to this were samples from MW-5S, along the western property boundary adjacent to the Teplitz auto salvage facility. Significant levels of petroleum hydrocarbons (totalling 1000 ppm or 0.1%) were found. It is likely that this contamination, although it impacts the Swivelier property, has its source at the Teplitz facility.

3.1.2 Groundwater

The groundwater investigation included the installation of 17 monitoring wells to evaluate shallow, intermediate and deep overburden as well as bedrock aquifers (see Figure 4 for locations). Wells were installed upgradient, side gradient, within the source area and downgradient of the source area (including off site). This study revealed a north-south trending VOC plume that emanates from the discharge area and continues south along the east side of the drainage ditch (Figure 5). Monitoring wells installed west of the drainage ditch as well as south

of West Nyack Road were either free of contamination or had very low levels of VOCs totalling less than 20 ppb. Total VOC levels in MW-6S, MW-6I and MW-3S ranged from 0.5 to 1.5 ppm. The shallow wells (MW-6S and MW-3S) are screened between 8 and 21 feet below ground surface and MW-6I is screened between 60 and 80 feet below ground surface. The major contaminants (in descending order) included 1,2 DCE, TCE and Vinyl Chloride. The groundwater standard for each of these contaminants is 5 ppb. The exception to this contaminant pattern was again MW-5S adjacent to Teplitz which contained high concentrations of petroleum hydrocarbon (gasoline, diesel fuel and motor oil) totalling approximately 56 ppm. In addition, this well had a 5-inch floating oil product layer. The Teplitz property has been referred to the NYSDEC Division of Spills Management to address these contaminant problems.

One of the goals of the remedial investigation was to determine if contamination found at the L.A. Woman nightclub, 0.4 miles downgradient of Swivelier, is related to contaminant releases from this Site. CDM's analysis of the two contaminant migration pathways (surface water and groundwater flow) shows that it is very unlikely Swivelier is the cause of the contaminant event which produced high levels of VOCs (5400 ppb of TCE) in the L.A. Woman well in 1991. Details of this analysis can be found in the Phase 2 RI/FS report for the Swivelier Site. Additional investigations will be performed by NYSDEC to determine the source of the VOC contamination in the L.A. Woman well.

3.1.3 Sediments

The study of sediments focused primarily on shallow sediments (0 to 3 feet) within the drainage ditch west of the Swivelier building. Samples were collected at the discharge pipe which flows into this ditch as well as both upstream and downstream of this discharge point. Additional sampling was conducted along Nauraushaun Creek, a north-south trending creek which lies 1000 feet west of Swivelier and into which the drainage ditch enters about 0.3 miles southwest of the site. VOC levels are highest at the discharge pipe and decrease rapidly downstream to low ppb levels within 150 feet (Figure 6). Total VOCs at the discharge pipe [predominantly TCE, 1,2 DCE, tetrachloroethene (PCE) and Vinyl Chloride] are as high as 1250 ppm. Low levels of petroleum products are also found in the drainage ditch both upstream and downstream of the source area, suggesting an off-site source. The recommended clean up objective for VOC contamination in sediments would follow soil cleanup guidelines, ranging from 0.2 to 1.4 ppm. No impacts to Nauraushaun Creek were identified which could be attributed to Swivelier.

3.1.4 Surface Water

Surface water sampling was conducted in conjunction with sediment sampling and samples were taken in approximately the same locations within the drainage ditch and Nauraushaun Creek. The highest levels of VOC contamination (predominantly 1,2 DCE, TCE

and Vinyl Chloride) were found at the discharge point where total VOCs were as high as 1.9 ppm. Levels decreased downstream gradually until they reached non-detect at the confluence of the drainage ditch and Nauraushaun Creek. Water quality guidelines for these contaminants in surface water (based on 6 NYCRR Part 700-705, NYSDEC Water Quality Regulations for Surface Waters and Groundwater) range from 0.3 ppb to 11 ppb. No impacts to Nauraushaun Creek were identified which could be attributed to the Swivelier site.

3.1.5 Floor Pits

Two cement-lined floor pits within a tenant-leased portion of the Swivelier building contained liquid wastes which were sampled for volatile organics. VOC levels (predominantly TCE and 1,2 DCE) totalled approximately 150 ppm. An Interim Remedial Measure (IRM) was conducted on December 19, 1995 in which all liquids and sludges were removed from the pits and disposed of at a permitted facility. In addition to evaluating the floor pit materials, a soil gas survey was conducted of the shallow soils (above the water table) which lie beneath the building foundation and adjacent to these pits to determine if contaminants may have leaked from the pits. The two soil gas points immediately adjacent to these pits had total VOC levels of 8 to 11 ppm, predominantly TCE and 1,2 DCE. Levels decreased rapidly within 10 feet of these pits to low ppb levels indicating some impacts from the pits to the surrounding soils, however, seepage appears to have been very limited.

3.2 Interim Remedial Measures

Interim Remedial Measures (IRMs) are conducted at sites when a source of contamination or an exposure pathway can be effectively addressed before completion of the RI/FS.

As described in Sections 2.2 and 3.1.5, an IRM was conducted on December 19, 1995 to address liquids and sludges found in two floor pits within a tenant-leased portion of the Swivelier building. A total of 1350 gallons of liquid and sludges was removed as well as two drums of contaminated debris found on the floor of the pits. All contaminated materials were transported to a facility permitted to accept this waste.

3.3 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 health risks can be found in Section 5 the RI Reports.

An exposure pathway is the process by which an individual comes into contact with a contaminant. The five elements of an exposure pathway are: 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of

exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

Contaminants of concern at the Swivelier Site include TCE and associated breakdown products, particularly 1,2 DCE and Vinyl Chloride. These contaminants impact soils adjacent to the discharge pipe, sediment in the on-site portion of the drainage ditch west of the Swivelier building, surface water both on and off site within the drainage ditch, on- site groundwater east of the drainage ditch and in soils beneath the foundation of the Swivelier building, adjacent to the remediated floor pits.

Exposure pathways evaluated in the risk assessment include current and future land-use risk scenarios.

Potential exposure pathways for current land-use risk scenarios are as follows:

1. Dermal contact with surface water;
2. dermal contact with sediments; and
3. incidental ingestion of sediments.

Potential exposure pathways for future land use risk scenarios are as follows:

1. Inhalation of fugitive dust;
2. incidental ingestion of surface soils;
3. dermal contact with surface soils;
4. inhalation of VOCs from groundwater while showering;
5. ingestion of VOCs from groundwater;
6. dermal contact with surface water;
7. incidental ingestion of sediments; and
8. dermal contact with sediments.

In the risk assessment, the likelihood of noncarcinogenic effects is indicated by the hazard index, while the risk of carcinogenic effects is presented as a probability. A hazard index greater than one indicates that adverse noncarcinogenic effects may occur. A risk greater than the New York State Department of Health's remediation risk goal of $1x10^{-6}$ (one in one million) indicates there is an unacceptable excess risk of carcinogenic effects.

The risk assessment indicates that for current use of the site, the exposure scenarios of dermal contact with surface water and dermal contact with sediments and incidental ingestion of sediments by persons on-site for recreational purposes had a hazard index below one, but all three exposure scenarios were calculated to have a carcinogenic risk greater than one in one million. The fact that the carcinogenic risk exceeds the NYSDOH remediation risk goal of one in one million indicates that remediation is warranted to protect recreational visitors.

The risk assessment also indicates that for future land use of the site, several residential exposure scenarios were associated with unacceptable risks. Although the risk for inhalation of fugitive dust was estimated to be less than one in one million, the risk for incidental ingestion of and dermal contact with surface soils was estimated to exceed one in one million. None of the hazard indices for these scenarios exceeded one. If used as potable water, on-site groundwater ingestion and inhalation risk estimates exceeded the one in one million risk level and the hazard index was calculated to be greater than one. Estimated risks of dermal contact with surface water, dermal contact with sediments and incidental ingestion of sediments in the on-site ditch exceeded the hazard index of one and the carcinogenic risk level of one in one million. The fact that the carcinogenic risk estimates for several exposure pathways exceed the NYSDOH remediation risk goal of one in one million indicates that remediation is required to protect residents should the site be used for residential purposes in the future. Beyond soil and sediment removal, it will also be necessary to restrict the placement of private water supply wells on site in the future.

3.4 Summary of Environmental Exposure Pathways

This section summarizes the types of environmental exposures which may be presented by the site.

Since this site is located in a light industrial/commercial area, it has minimal ecological resources or receptors and lacks the pathways for contaminant migration. This, in combination with the nature, extent and concentration of contaminants from the Swivelier site, results in a negligible impact to environmental resources.

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. Only one Potential Responsible Party, the Swivelier Company, has been documented to date for this site.

The PRP failed to implement the RI/FS at the site when requested by the NYSDEC. After the remedy is selected, the PRP will again be contacted to assume responsibility for the remedial program. If an agreement cannot be reached with the PRP, the NYSDEC will evaluate the site for further action under the State Superfund. The PRP is subject to legal actions by the State for recovery of all response costs the State has incurred.

SECTION 5: SUMMARY OF THE REMEDIATION GOALS:

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. These goals are established under the overall goal of

meeting all standards, criteria, and guidance (SCGs) and protecting human health and the environment.

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

The goals selected for this site are:

- *Reduce, control, or eliminate the contamination present within the on- site soils and sediments.*
- *Eliminate the threat to surface waters by remediating any contaminated sediments and soils on site.*
- *Eliminate the potential for direct human or animal contact with the contaminated soils, sediments and groundwater on site.*
- *Mitigate continuing impacts to contaminated groundwater.*

SECTION 6: SUMMARY OF THE EVALUATION OF ALTERNATIVES

Potential remedial alternatives for the Swivelier site were identified, screened and evaluated in a three-phase Feasibility Study. This evaluation is presented in the report entitled "Phase I and II Feasibility Report for the Swivelier Company Site" dated June 1995 and "Phase III Feasibility Report for the Swivelier Company Site" dated February 1996. A summary of the detailed analysis follows.

6.1 Description of Remedial Alternatives

The potential remedies are intended to address the contaminated soils, sediments, surface water and groundwater at the site.

Soil

Alternative S-1 - No Action and Deed Restrictions on Future Land-Use

Present Worth:	$ 5,000
Capital Cost:	$ 5,000
Annual O&M:	- 0-
Time to Implement:	One Month

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. Under this alternative, the site would remain in its present condition and the environment would not be provided any additional protection. Human health concerns would be reduced by the use of deed or access restrictions and signs. While no active steps would be taken under this alternative to improve environmental quality, it is assumed that natural attenuation and biodegradation would continue to occur as it is occurring now. The present worth costs are for administrative and legal contingencies for implementation of access (deed) restrictions.

Alternative S-2 - Hot Spot Excavation and Off-Site Disposal of Excavated Soil.

Present Worth:	$ 197,040
Capital Cost:	$ 197,040
Annual O&M:	-0-
Time to Implement:	One Month

Contaminated soil meeting the criteria for cleanup would be excavated and temporarily staged on site prior to final sampling and off-site disposal. Soils to be excavated are confined to those along the discharge pipe which have been impacted by VOC contamination at levels which exceed cleanup criteria. It is estimated that approximately 150 cubic yards of soil are impacted. The depth of the excavation is estimated not to exceed 8 feet. The excavation would be backfilled with clean soil. Once the excavated soil has been characterized it would be shipped off site to a facility permitted to accept this waste. Soils affected by low levels of contamination (below the cleanup criteria) would be left on site.

Alternative S-3A - Hot Spot Excavation, On-Site Soil Venting of Unsaturated Soils, Off-Site Disposal of Saturated Soils.

Present Worth:	$ 219,325
Capital Cost:	$ 207,553
Annual O&M:	$ 11,772
Time to Implement:	Two Months

As described in Alternative S-2, this alternative would include excavation and staging of contaminated soils as well as backfilling of the excavation with clean soils. The unsaturated soils would be staged on a layer of sand or gravel to allow excess moisture to drain from the pile. This in turn would be underlain by a liner to prohibit seepage into the ground.

The pile would be covered with a plastic membrane to minimize infiltration of precipitation and limit the escape of VOCs into the air.

Soil vapor extraction (SVE) or soil venting would be utilized to remove VOC contaminants from soils and sediments. In SVE, a vacuum would be applied to this media through a series of perforated pipes installed within the pile. The vacuum creates a pressure gradient that induces the VOCs to diffuse through this media, into the perforated pipes and vented to a catalytic oxidation and HCL scrubber system. Soil venting and associated equipment would be installed and operated for an estimated four weeks until VOC concentrations decrease to acceptable levels in the soil pile. Excess moisture which drains from the pile would be captured and treated utilizing an on-site air stripper. For purposes of cost estimating treated soils are assumed to require disposal at a solid waste facility. However, if levels remaining in treated soils are deemed clean enough for on-site disposal, these soils may be returned to the excavations or left on site.

Saturated soils would be disposed of off-site as described in Alternative S-2. The volume of saturated soils is estimated to be 17 cubic yards.

Alternative S-3B - Hot Spot Excavation, On-Site Soil Venting of Saturated and Unsaturated Soils.

Present Worth:	$ 221,075
Capital Cost:	$ 197,531
Annual O&M:	$ 23,544
Time to Implement:	Two Months

This alternative is similar to Alternative S-3A except that soil venting would be applied to both unsaturated and saturated sediments. Additional measures would be implemented to reduce excess moisture from the soils (longer drainage period, desiccants, hot air blowers) so that SVE can effectively reduce VOCs to acceptable levels.

Groundwater

Alternative G-1 - No Action, Deed Restrictions On Future On-Site Groundwater Use, Groundwater/Surface Water Monitoring.

Present Worth:	$ 121,925
Capital Cost:	$ 34,143
Annual O&M:	$ 17,556
Time to Implement:	Five Years

The no action alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only of the groundwater and surface water and does not include any treatment of these media.

Under this alternative, the site would remain in its present condition and the environment would not be provided any measure of contaminant reduction. Protection of human health would be carried out in the form of monitoring and deed restrictions. Monitoring is assumed to continue for a five year period.

Alternative G-2 - Extraction of Groundwater, Chemical Precipitation and Air Stripping of Contaminants, On-Site Discharge of Treated Water.

Present Worth:	$ 3,124,973
Capital Cost:	$ 1,254,834
Annual O&M:	$ 374,028
Time to Implement:	Six Years

This alternative would involve the installation of groundwater pumping wells in the shallow and intermediate overburden aquifers. Contaminated groundwater would be pumped to an on-site water treatment facility which would be designed to remove VOCs to acceptable levels before discharging treated water to the on-site drainage ditch. The treatment train includes chemical precipitation to remove metals in the groundwater which may interfere with the efficiency of VOC removal. Once the metals are removed, VOCs would be treated using an air stripper, a proven, cost-effective method for removal of volatile organics. It is estimated that groundwater pump and treat would need to operate for five years.

Alternative G-3 - In-Situ Biodegradation of Vinyl Chloride.

Present Worth:	$ 314,454
Capital Cost:	$ 237,717
Annual O&M:	$ 38,369
Time to Implement:	Six Years

This alternative focuses on the breakdown of vinyl chloride, a by-product of the anaerobic breakdown of TCE. Studies have shown that vinyl chloride will breakdown under aerobic conditions through the introduction of an oxygen source within the groundwater. This oxygen releasing compound (ORC) would be placed in the groundwater via a series of shallow and intermediate depth wells in the source area and at the leading edge of the plume. This technology would not be cost-effective when applied to remediation of the entire plume as it is difficult to dispense into the plume without the benefit of hundreds of closely spaced wells. It may be applicable at the leading edge of the plume to intercept vinyl chloride from migrating off site. The ORC compound would require replacement every six months. Costs are based on two years of operation.

ORC is an innovative technology which has been shown to degrade vinyl chloride under laboratory conditions. It is not, however, a proven technology when applied to a full-scale field operation.

Sediments

Alternative SD-1 - No Action, Deed Restrictions.

Present Worth:	$ 5,000
Capital Cost:	$ 5,000
Annual O&M:	-0-
Time to Implement:	One Month

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.

Under this alternative, the site would remain in its present condition. Human health would be protected through the use of deed restrictions. While no active steps would be taken under this alternative to improve environmental quality, it is assumed that natural attenuation and bio- degradation would continue to occur as it is occurring now. The present worth costs are for administrative and legal contingencies for implementation of access (deed) restrictions.

Alternative SD-2A- Hot Spot Excavation and Off-Site Disposal of Excavated Sediments.

Present Worth:	$ 279,375
Capital Cost:	$ 279,375
Annual O&M:	-0-
Time to Implement:	One Month

This alternative would be similar to the Soils Alternative S-2. Contaminated sediments meeting the soil criteria for clean up would be excavated and temporarily staged on site prior to final sampling and off-site disposal. Soil cleanup criteria are being applied because these sediments are derived from a man-made drainage ditch within an industrial setting and are not considered ecologically significant. Sediments to be excavated would include those within the drainage ditch, beginning at the discharge pipe and extending downstream about 70 feet. The depth of excavation is not expected to exceed three feet. The estimated volume of material is 160 cubic yards, however, this represents a very conservative estimate based on contamination extending ten feet to either side of the ditch. It is very likely that contaminants are confined to within five feet on either side of the ditch in which case the volume of contaminated sediments would be 50 percent less (80 cubic yards). The cost of this alternative would be reduced by 30 to 40 percent based on this volume. The excavation would be backfilled with clean sand or gravel.

Once the excavated sediments have been characterized, they would be shipped off site to a facility permitted to accept this waste. Sediments affected by low levels of contamination (below the cleanup criteria) would be left on site.

Alternative SD-2B - Hot Spot Excavation and On-Site Soil Venting of Excavated Sediments.

Present Worth:	$ 183,222
Capital Cost:	$ 154,278
Annual O&M:	$ 28,944
Time to Implement:	Four Months

This alternative would include excavation and on-site soil venting of contaminated sediments as described in the Soils Alternative S-3B.

As with soils, if levels remaining in treated sediments are deemed clean enough for on-site disposal, these sediments may be returned to the excavation or disposed of on-site.

6.2 Evaluation of Remedial Alternatives

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

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

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

Soils - While no chemical-specific standards exist for VOC contamination in soils, NYS has recommended soil cleanup objectives [NYS Division of Hazardous Waste Remediation (DHWR) Technical Administrative Guidance Memorandum (TAGM) Number 4046, "Determination of Soil Cleanup Objectives and Cleanup Levels,"] which would apply to contaminated soils at Swivelier. The No Action alternative (S-1) would leave contaminated soil in place so that the cleanup objectives would not be met. Alternatives S-2, S-3A and S-3B offer remedial options which would remove contaminates from the site via off site disposal or on-site treatment. Since these soils contain listed hazardous wastes (according to 6 NYCRR Part 371), once excavated, they must be managed as hazardous wastes unless, or until, the concentrations of the listed contaminants (i.e., TCE, 1,2 DCE, vinyl chloride) are reduced to, or below, the Action Level

concentration as outlined in NYS DHSR TAGM Number 3028, "Contained In" Criteria. Alternatives S-2 and S-3A would require disposal of contaminated soils at a facility permitted to accept hazardous wastes. Alternatives S-3A and S-3B include on-site soil venting and would require reduction of contaminants to, or below, action levels (based on TAGM 3028) to be handled as a non-hazardous waste. Once treated to at or below action levels, the resultant material may be disposed of on the site or shipped off the property as an industrial solid waste to a permitted Part 360 land disposal facility.

Groundwater - Alternative G-1, No Action, includes no active remedial measures to reduce contaminants in groundwater. Natural attenuation or biodegradation are processes which may reduce concentrations, however, applicable groundwater SCGs are not likely to be achieved soon, possibly only after several decades. Alternative G-2, a groundwater pump and treat option, would provide an active mechanism for reducing contaminants in groundwater. Significant reduction of contaminants rather than achieving groundwater standards is the goal of this alternative. Most case studies have shown that reducing chlorinated organic contaminant levels to at or below standards is difficult to achieve within reasonable time frames (decades) or at a reasonable cost. Alternative G-3, in-situ biodegradation of vinyl chloride, would be implemented to address vinyl chloride at the leading edge of the plume and at the source area rather than addressing it throughout the plume. This technology does not have a proven record of successes. While data appears to support the breakdown of vinyl chloride under aerobic conditions, it is unproven under natural field conditions with respect to achieving (or significantly reducing) groundwater SCGs.

Sediments - Sediment Alternatives SD-1, SD-2A and SD-2B are consistent with Soil Alternatives S-1, S-2, S-3A and S-3B with respect to compliance with NYS SCGs.

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

Soils - Under the No Action alternative (Alternative S-1), soils would remain in place. This alternative offers no remedial actions, however, access restrictions would be implemented to limit human contact with soils.

For the future land-use scenerio, the carcinogenic risk for incidental ingestion and dermal contact with surface soils is estimated to exceed one in one million. Based on this risk, the NYSDOH has recommended that remediation be conducted to protect area residents should the site be used for residential purposes in the future. Soil alternatives S-2, S-3A and S-3B meet the recommendations from NYSDOH to reduce risk to acceptable levels.

Due to the site location, there are minimal ecological resources or receptors so that negligible environmental impacts would be expected. Alternatives S-2, S-3A and S-3B call for off-site disposal or on-site treatment. Once the contamination is removed from the soil, any potential for

exposure to contaminants in this media is eliminated. Soils with low levels of contamination (below cleanup criteria) would be left in place, however, these would present a negligible risk.

Groundwater - The current human exposure pathway to contaminated groundwater is incomplete as no current groundwater users exist within the vicinity of the plume. However, if used as potable water, on-site groundwater ingestion and inhalation risk estimates for future land-use scenerios exceed the one in one million risk level and the hazard index was calculated to be greater than one. The No Action alternative provides for groundwater monitoring and deed restrictions on groundwater usage on-site to insure that any future potential human exposure is minimized. Alternatives G-2 and G-3 provide active remedial measures to improve groundwater quality. In addition, these alternatives would minimize the potential for further downgradient migration of contaminants.

Sediments - Under the No Action alternative (Alternative SD-1), sediments would remain in place. This alternative offers no remedial actions, however, access restrictions would be implemented to limit human contact with sediments. For current land-use scenerios, dermal contact and incidental ingestion of sediments by persons on site for recreational purposes have a carcinogenic risk greater than one in one million, warranting the recommendation for remediation by the NYSDOH. For future exposure scenerios, estimated risks of dermal contact with, and incidental ingestion of, sediments on site exceed the hazard index of one and the carcinogenic risk level of one in one million. The NYSDOH has recommended that, based on this risk to future residents, remediation of sediments be conducted.

Alternatives SD-2A and SD-2B meet NYSDOH recommendations to reduce risk to acceptable levels.

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 construction and implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared with the other alternatives.

Soils - Alternative S-1, No Action, would have no adverse short-term impacts to the community, workers or the environment because soils would be left undisturbed. Alternatives S-2, S-3A and S-3B involve excavation and off site disposal or on-site treatment of contaminated soils. Minor short-term impacts exist in the form of increased traffic, noise, dust and vapors. This would be a very short-term impact due to the small volume of soils affected (approximately 150 cubic yards).

Groundwater - Alternative G-1, No Action, would have no short-term impacts. Alternative G-2 would involve the construction of an on-site wastewater treatment facility.

Sediments - Sediment Alternatives SD-1, SD-2A and SD-2B are consistent with Soil Alternatives S-1, S-2, S-3A and S-3B with respect to short-term impacts.

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

Soils - Alternative S-1 is a No Action Alternative which would leave contaminants in place, providing no long-term effectiveness. Alternatives S-2, S-3A and S-3B offer remedial measures which eliminate any long-term risk because contaminated media would be removed from this site.

Groundwater - Alternative G-1 controls risk through on-site monitoring and deed (access) restrictions as contaminants will be left in place. Source elimination along with natural attenuation and biodegradation would lower risk over time as contaminant levels would decrease. Alternatives G-2 and G-3 would reduce contaminant levels in groundwater as well as control contaminant migration. As a result, long-term effectiveness would be enhanced, reducing potential risk to human health.

Sediments - Sediment Alternatives SD-1, SD-2 and SD-3 are consistent with Soil Alternatives S-1, S-2 and S-3 with respect to long-term effectiveness.

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.

Soils - The No Action Alternative (S-1) provides no reduction of toxicity, mobility or volume of waste as it is left in place. Alternatives S-2 and S-3 would eliminate these three parameters with respect to the site; however, Alternative S-2, off-site disposal, would not reduce the toxicity or volume of waste with respect to its off-site disposal location. It is expected, however, that the mobility of contaminants would be reduced when placed in a secure disposal facility.

Groundwater - The No Action Alternative (G-1) provides no active means of reducing the toxicity, mobility or volume of contaminants in groundwater. Natural processes of attenuation and biodegradation would reduce these parameters over time. Alternatives G-2 and G-3 would reduce the toxicity, mobility and volume of contaminants through active treatment technologies.

Sediments - Sediment Alternatives SD-1, SD-2 and SD-3 are consistent with Soil Alternatives S-1, S-2 and S-3 with respect to reduction of toxicity, mobility and volume of contaminants.

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

Soils - There are no technical or administrative obstacles associated with either the no action alternative or the active remedial options. Source removal via off- site disposal or active on-site treatment utilize technologies which are proven and feasible.

Groundwater - As with soils, there are no technical barriers associated with the implementation of any of the alternatives. Some administrative obstacles may be encountered with the construction and operation of a water treatment facility on-site (Alternative G-2). Overall, however, this technology poses no significant inconveniences to the community.

Sediments - Sediment Alternatives SD-1, SD-2A and SD-2B are consistent with Soil Alternatives S-1, S-2, S-3A and S-3B with respect to implementability.

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

Soils - Alternative S-1 has minor costs associated with administrative activities. Comparing Alternatives S-2 with S-3A and S-3B, Alternative S-3B is estimated to be less costly assuming soils and sediments would be treated together using a single technology.

Groundwater - The no action alternative is significantly less expensive that the active treatment technologies, particularly Alternative G-2. Alternative G-1 includes costs for long-term monitoring and the installation of one additional downgradient monitoring well cluster, while Alternative G-2 utilizes pump and treatment technologies which necessitate high capital expenditures coupled with long-term operation and maintenance. Alternative G-3 is estimated to be more than double the cost of G-1.

Sediments - Alternative SD-1 has minor costs associated with administrative activities. The costs associated with Alternatives SD-2A and SD-2B are not stand-alone costs as they are highly dependent on soil remediation costs. Alternative SD-2A assumes that it would be conducted in conjunction with soil Alternative S-2, off-site disposal. Alternative SD-2B assumes that it would be conducted in conjunction with soil Alternative S-3B, on-site soil venting of saturated soils.

Comparing total costs of off-site disposal of soils and sediments (S-2 and SD-2A) with on-site treatment of all soils and sediments (S-3B and SD-2B), the difference favors on-site treatment.. This final criterion is considered a modifying criterion and is taken into account after evaluating those above. It was focused on after public comments on the Proposed Remedial Action Plan were received.

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

SECTION 7 SUMMARY OF THE SELECTED ALTERNATIVE

Based upon the results of the RI/FS, and the evaluation presented in Section 6, the NYSDEC has selected the following alternatives as the remedy for this site:

Soils - Alternative S-2, Hot Spot Excavation and Off-Site Disposal or Alternative S-3B, Hot Spot Excavation, and On-Site Soil Venting

Groundwater - Alternative G-1, No Action, Access (Deed) Restrictions On Site to Minimize Exposure to Groundwater and Groundwater/Surface Water Monitoring

Sediments - Alternative SD-2A, Hot Spot Excavation and Off-Site Disposal or Alternative SD-2B, Hot Spot Excavation and On-Site Soil Venting

Soils - Alternatives S-2, S-3A and S-3B offer similar benefit in terms of meeting cleanup objectives and being protective of human health and the environment. In addition, these alternatives exhibit similar short and long-term effectiveness while reducing the toxicity, mobility and volume of contaminants. While these alternatives would be easy to implement, Alternative S-2 would be quicker, requiring trucking to an off site disposal facility. Alternative S-3A is less implementable because it would require using both on site and off site options. Preliminary estimates show Alternative S-3B to have a slightly lower cost than off-site disposal assuming that the same remedy is applied to both soils and sediments. There is a cost benefit if the total volume of soils and sediments is addressed under a single remedy; the cost savings weigh in favor of on-site treatment. Because Alternative S-3A would require implementing both the off-site and on-site options, it's more costly than off-site disposal. While the no action

alternative is a considerably less costly, implementable option, it fails to meet the other screening criteria. Since Alternatives S-2, and S-3B will equally meet most criteria, Alternative S-3B is tentatively selected as it is expected to be slightly lower in cost than Alternatives S-2. However, based on more detailed cost estimates during remedial design, should Alternative S-2 prove to be more cost beneficial, this alternative will likely be implemented.

Groundwater - Based on the minimal risks associated with all three groundwater alternatives, Alternative G-1 is the selected alternative as it is the lowest in cost while still being protective of human health and the environment. None of the alternatives are expected to achieve SCGs, or only perhaps after several decades. Contaminants under Alternative G-1 will decrease through natural processes (attenuation and biodegradation) provided the contaminant source is removed. Alternative G-1 will be protective of human health and the environment so long as monitoring and deed restrictions are part of this alternative since the risk assessment has determined that health risks do exist for future land-use scenarios. Although Alternatives G-2 and G-3 would provide a faster reduction of contaminants in on-site groundwater, their additional costs are not justified based on the minimal risks associated with all three groundwater alternatives. If the long-term monitoring program reveals off site impacts at levels which pose a concern, additional remedial options will be evaluated.

Sediments - Comparison of the various screening criteria shows the sediments to be very similar to soils, particularly with respect to compliance with SCGs, short and long-term effectiveness, reduction of toxicity, mobility and volume, implementability and cost. The human health and environmental risks are somewhat higher with sediments, as compared to soils, since contaminant concentrations in stream sediments are higher and the pathway for exposure more direct. This would be of concern under the no action alternatives. Since Alternatives SD-2A and SD-2B would equally meet most criteria, Alternative SD-2B is tentatively selected as it is lower in cost than off-site disposal. If the off-site treatment alternative proves to be more cost benefical upon detailed design and cost analysis, this alternative will likely be implemented.

The estimated present worth cost to implement the remedy is $526,222. The cost to construct the remedy is estimated to be $385,952 and annual operation and maintenance costs are estimated to be $28,054.

The elements of the selected remedy are as follows:

- A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction; operation and maintenance; and monitoring of the remedial program.

- Saturated and unsaturated, soils and sediments will be excavated with a backhoe (or comparable equipment) and replaced with clean fill. Dust and erosion control measures will be employed to minimize any short-term impacts on human health or the environment from on-site contamination.

- Excavated soils and sediments will be handled using one of the following options:

  Option 1 - Soils and sediments which are determined to be hazardous waste will be hauled off site to a disposal facility permitted to accept hazardous waste. Those materials which are not hazardous wastes will be either left on site or disposed at a permitted, solid waste facility.

  Option 2 - Soils and sediments will be treated on-site utilizing soil venting technology. Exhaust vapors will be treated with catalytic oxidation. Treated soils will be disposed at a permitted solid waste facility or left on site depending on residual contamination levels.

- Access and deed restrictions for future on-site groundwater use will be pursued to assure that human and environmental exposure pathways for groundwater (and surface water) are severely limited. A five-year monitoring plan for groundwater and surface water will be implemented to determine if the remedial actions (contaminated soil and sediment removal) are having the intended effect of helping to reduce impacts to groundwater, causing a decrease in groundwater (and surface water) contamination levels. In addition, monitoring for any off-site impacts is necessary to insure that the groundwater plume is not growing and/or moving off site. A groundwater monitoring well cluster will be installed to monitor potential off-site migration in a southwesterly direction. If the long-term monitoring program reveals off site impacts at levels which pose a concern, additional remedial options will be evaluated. The NYSDEC will further investigate the probable source(s) of the high levels of VOCs detected in the L.A. Woman well and take action as appropriate.

SECTION 8 HIGHLIGHTS OF COMMUNITY PARTICIPATION

The NYSDEC and NYSDOH held three public meetings at the Clarkstown Town Hall. The purpose of these meetings was to provide an open forum where information about the site could be offered and discussed. A project work plan meeting was held in April 1994 to discuss NYSDEC plans for an RI/FS project at Swivelier. A second meeting was held to discuss the results of the Phase I RI/FS. A final public meeting was held on March 6, 1996 to present the sum findings of the RI/FS project and a Proposed Remedial Action for the cleanup of Swivelier.

The public comment period on the PRAP was open from February 17, 1996 to March 19, 1996. On February 6, 1996, a fact sheet and a public notice announcing the comment period and public meeting were issued to the press and interested parties.

Final copies of all reports and fact sheets were placed in document repositories at the Clarkstown Town Hall, the Nanuet Public Library, the NYSDEC Region 3 Office and the NYSDEC Central office in Albany. Comments received during the comment period and during the public meeting have been summarized in a Responseviness Summary, presented as Appendix A of this ROD. The remedy presented in this ROD is slightly different than the remedy proposed in the PRAP. The following changes were made:

1. On-site treatment of soils and sediments, upon additional cost analysis, was found to be slightly less costly than off-site disposal. When cost estimates are further refined during remedial design, the most cost effective remedy will be implemented.

2. A groundwater monitoring well cluster was added to the no-action alternative to monitor the potential southwesterly contaminant migration pathway.

TABLE 1
REPRESENTATIVE CONTAMINANTS
SWIVELIER COMPANY - SITE NO. 344036

SOILS

Contaminant	Concentration Range, ppb			Cleanup** Goal	No. that Exceed Goal	No. of Samples
	Minimum*	Maximum	Average*			
1,2-DCE	28	68,000	8560	250	7	45
TCE	10	150,000	16,730	700	4	45
Vinyl Chloride	1,300	1,300	1,300	200	1	45

SEDIMENTS

Contaminant	Concentration Range, ppb			Cleanup** Goal	No. that Exceed Goal	No. of Samples
	Minimum*	Maximum	Average*			
1,2-DCE	4,000	53,000	25,400	250	5	16
TCE	440	1,200,000	334,100	700	3	16
PCE	12,000	12,000	12,000	1400	1	16
Vinyl Chloride	990	2533	1760	200	2	16

SURFACE WATER

Contaminant	Concentration Range, ppb			Cleanup Goal	No. that Exceed Goal	No. of Samples
	Minimum*	Maximum	Average*			
1,2-DCE	2	1400	305	5	7	14
TCE	15	140	89	11	4	14
Vinyl Chloride	2	430	107	0.3	7	14

GROUNDWATER

Contaminant	Concentration Range, ppb			Cleanup Goal	No. that Exceed Goal	No. of Samples
	Minimum*	Maximum	Average*			
1,2-DCE	7	805	349	5	11	26
TCE	2	740	211	5	10	26
Vinyl Chloride	4	442	139	2	10	26
1,1,1-TCA	16	75	40	5	3	26

*Minimum and average values based only on those samples which exceeded detection limit

**Based on DHWR TAGM 4046, Determination of Soil Cleanup Objectives and Cleanup Levels

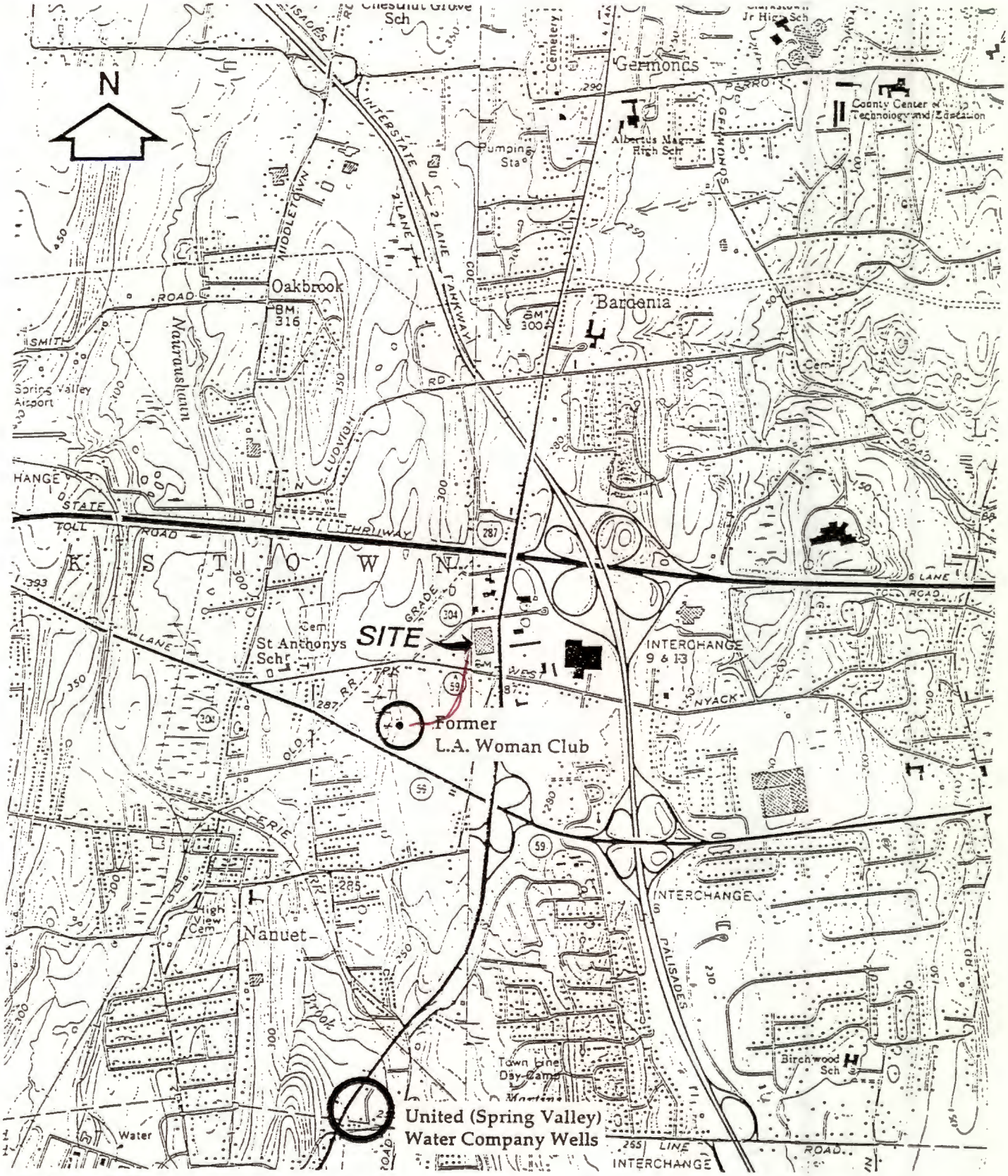
TABLE 2

COST SUMMARY OF REMEDIAL ALTERNATIVES

Alternative	Description	Present Worth	Capital Cost	Annual O&M Cost
S-1	No Action and Deed Restrictions on Future Land-Use	$5,000	$5,000	-0-
*S-2	Hot Spot Excavation, Off-Site Disposal of Excavated Soil	$197,040	$197,040	-0-
S-3A	Hot Spot Excavation, On-Site Soil Venting of Unsaturated Soils and Off-Site Disposal of Saturated Soils	$219,325	$207,553	$11,772
**S-3B	Hot Spot Excavation, On-Site Soil Venting of Saturated and Unsaturated Soils	$221,075	$197,531	$23,544
G-1	No Action, Deed Restrictions on Future Groundwater Use, Groundwater/Surface Water Monitoring	$121,925	$34,143	$17,556
G-2	Extraction of Groundwater, Chemical Precipitation, Air Stripping of Contaminants, On-Site Discharge of Treated Water	$3,124,973	$1,254,834	$374,028
G-3	In-Situ Biodegradation of Vinyl Chloride	$314,454	$237,717	$38,369
SD-1	No Action, Deed Restrictions	$5,000	$5,000	-0-
*SD-2A	Hot Spot Excavation, Off-Site Disposal of Excavated Sediments	$279,375	$279,375	-0-
**SD-2B	Hot Spot Excavation,On-Site Soil Venting	$183,222	$154,278	$28,944

*Costs assume that these two remedial alternatives will be performed together
**Costs assume that these two remedial alternatives will be performed together

FIGURES



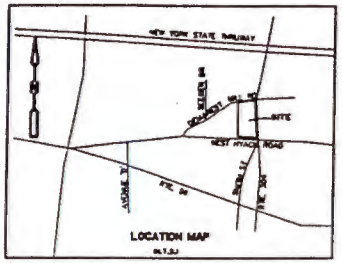
Base Map: Nyack-Park Ridge Quadrangle
New Jersey - New York
USGS. 7.5 Minute Series (Topographic)

Figure 1

Site Location Map

CDM Camp Dresser & McKee

Swivelier Site - Nanuet, New York
NYSDEC Site #3-44-036



LEGEND

- MONITORING WELL
- MANHOLE
- GRID NAIL
- UNDERGROUND PIPES AND CULVERTS
- SURVEY CONTROL POINT
- ROW MONUMENT
- APPROXIMATE LOCATION OF DRAINAGE DITCH (ARROW INDICATES FLOW DIRECTION)

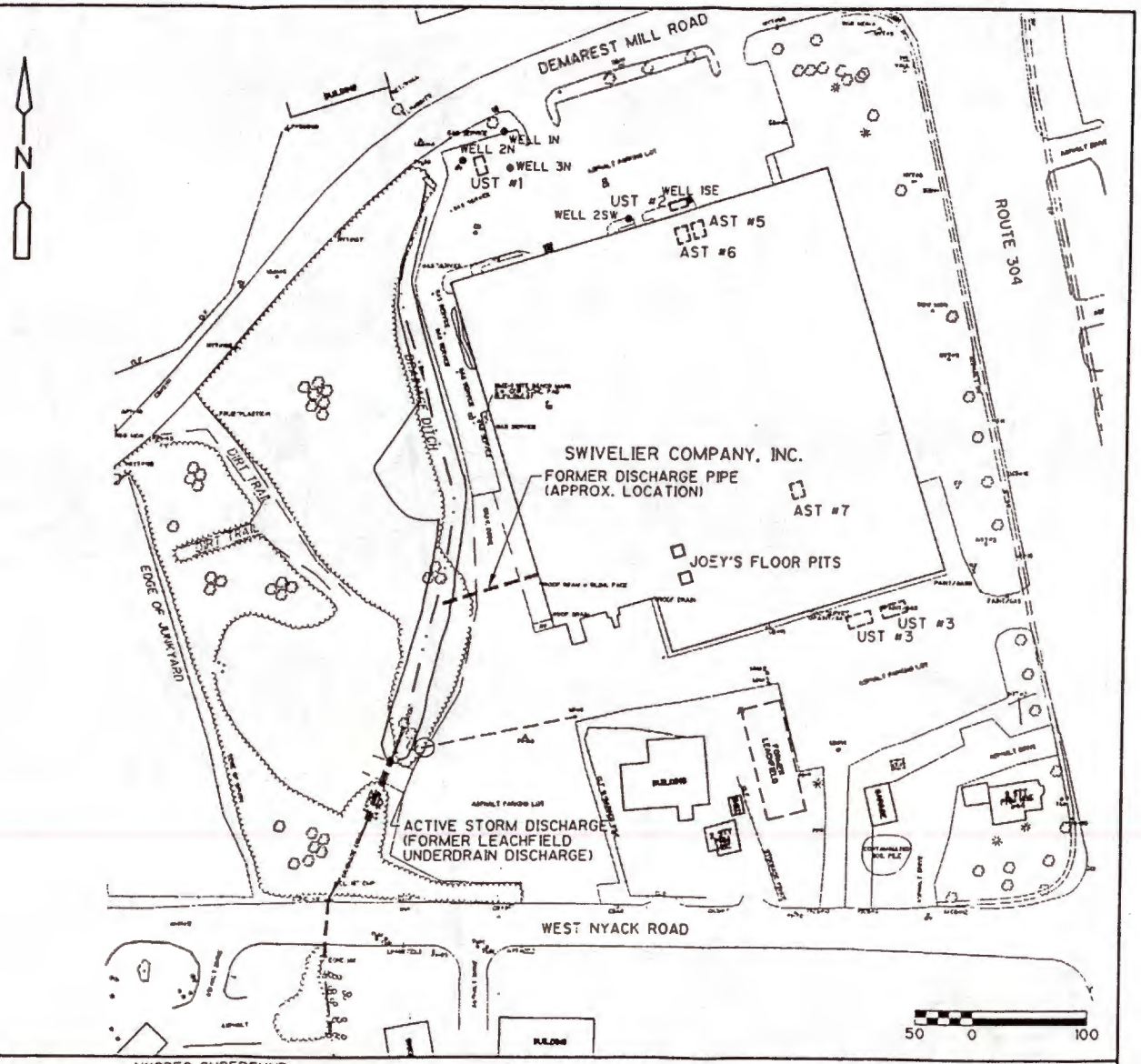
SURVEY NOTES

1.) ALL LOCATIONS ON THIS MAP ARE BASED ON THE NEW YORK STATE PLANE COORDINATE SYSTEM.

2.) ALL ELEVATIONS SHOWN ON THIS MAP ARE BASED ON THE 1929 ADJUSTMENT OF THE NATIONAL GEODETIC VERTICAL DATUM. MEAN SEA LEVEL

3.) ALL LOCATIONS SHOWN WERE INFERRED FROM SURFACE EVIDENCE ONLY. NO SUBSURFACE UTILITIES WERE DETECTED.

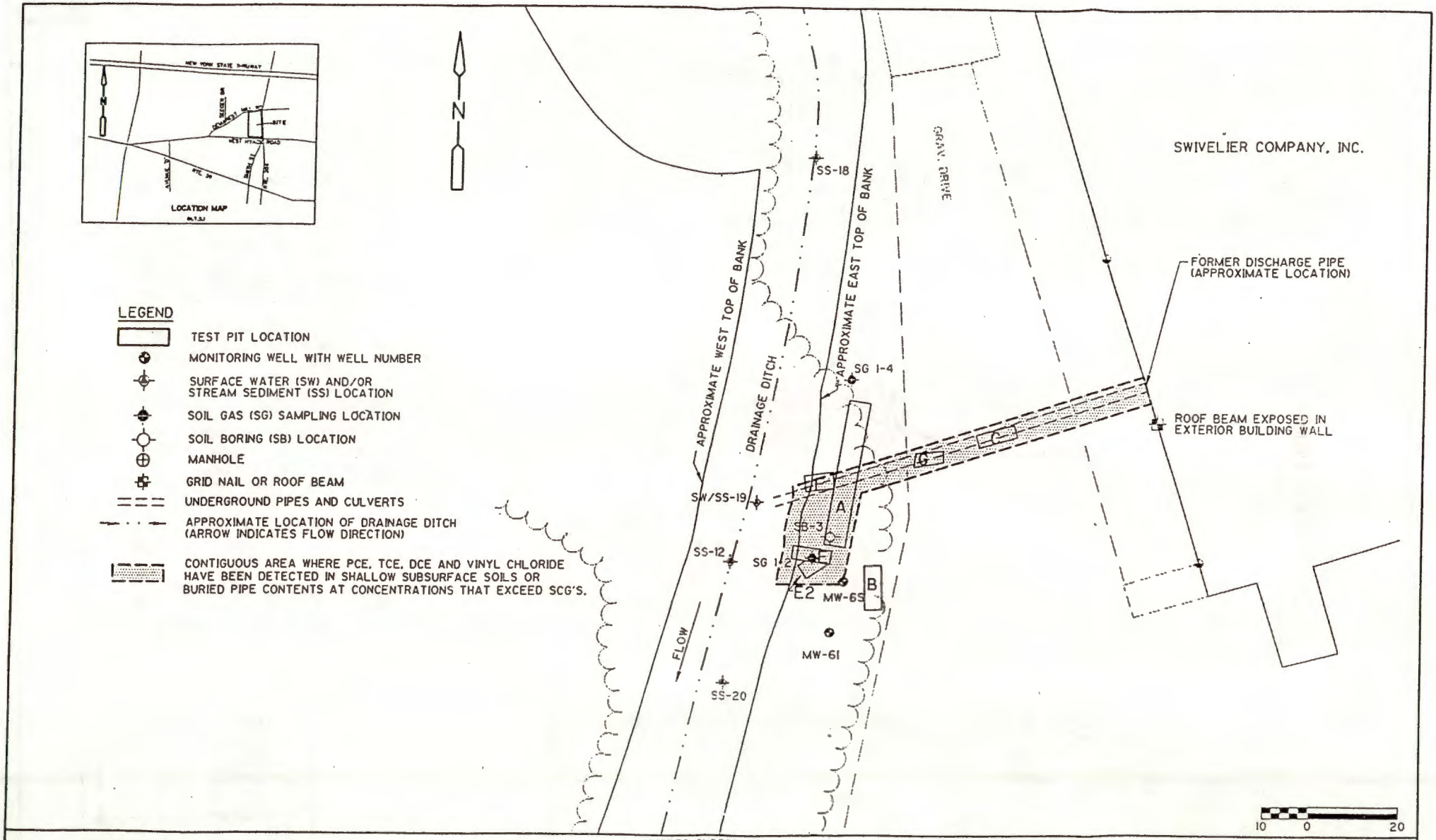
4.) SITE SURVEYED AND BASE MAP PREPARED BY OM P. POPLI, P.E., L.S., P.C. OCTOBER 1994/SEPTEMBER 1995.



NYSDEC SUPERFUND
SWIVELIER SITE-NYSDEC SITE #3-44-036
NANUET, NEW YORK
SITE PLAN

FIGURE 2

CDM
environmental engineers, scientists, planners, & management consultants

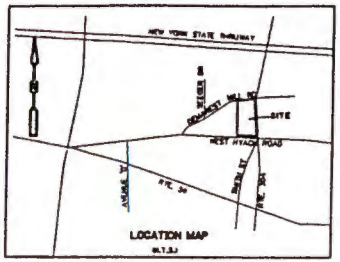


NYSDEC SUPERFUND
SWIVELIER SITE-NYSDEC SITE #3-44-036
NANUET, NEW YORK

FIGURE 3

SHALLOW SUBSURFACE SOIL CONTAMINATION

CDM
environmental engineers, scientists, planners, & management consultants



LEGEND

- MONITORING WELL (MW) LOCATION (LARGE AND BOLD FOR PHASE II)
- MANHOLE
- GRID NAIL
- SURVEY CONTROL POINT
- ROW MONUMENT
- APPROXIMATE LOCATION OF DRAINAGE DITCH (ARROW INDICATES FLOW DIRECTION)
- A——A' LOCATION OF CROSS-SECTION PRESENTED AS SEPARATE FIGURE

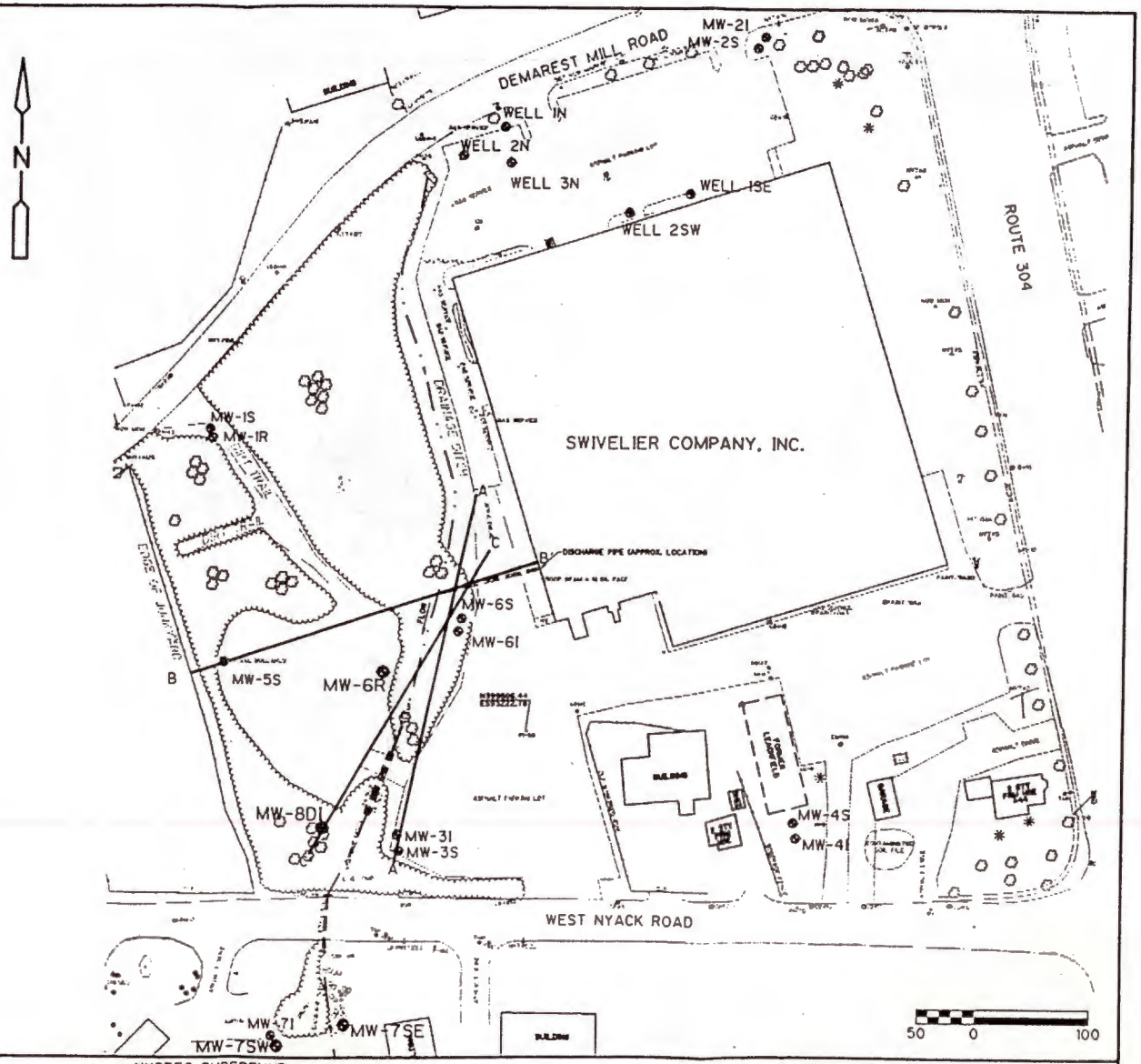
SURVEY NOTES

1.) ALL LOCATIONS ON THIS MAP ARE BASED ON THE NEW YORK STATE PLANE COORDINATE SYSTEM.

2.) ALL ELEVATIONS SHOWN ON THIS MAP ARE BASED ON THE 1929 ADJUSTMENT OF THE NATIONAL GEODETIC VERTICAL DATUM. MEAN SEA LEVEL

3.) ALL LOCATIONS SHOWN WERE INFERRED FROM SURFACE EVIDENCE ONLY. NO SUBSURFACE UTILITIES WERE DETECTED.

4.) SITE SURVEYED AND BASE MAP PREPARED BY OM P. POPLI, P.E., L.S., P.C. OCTOBER 1994/SEPTEMBER 1995.

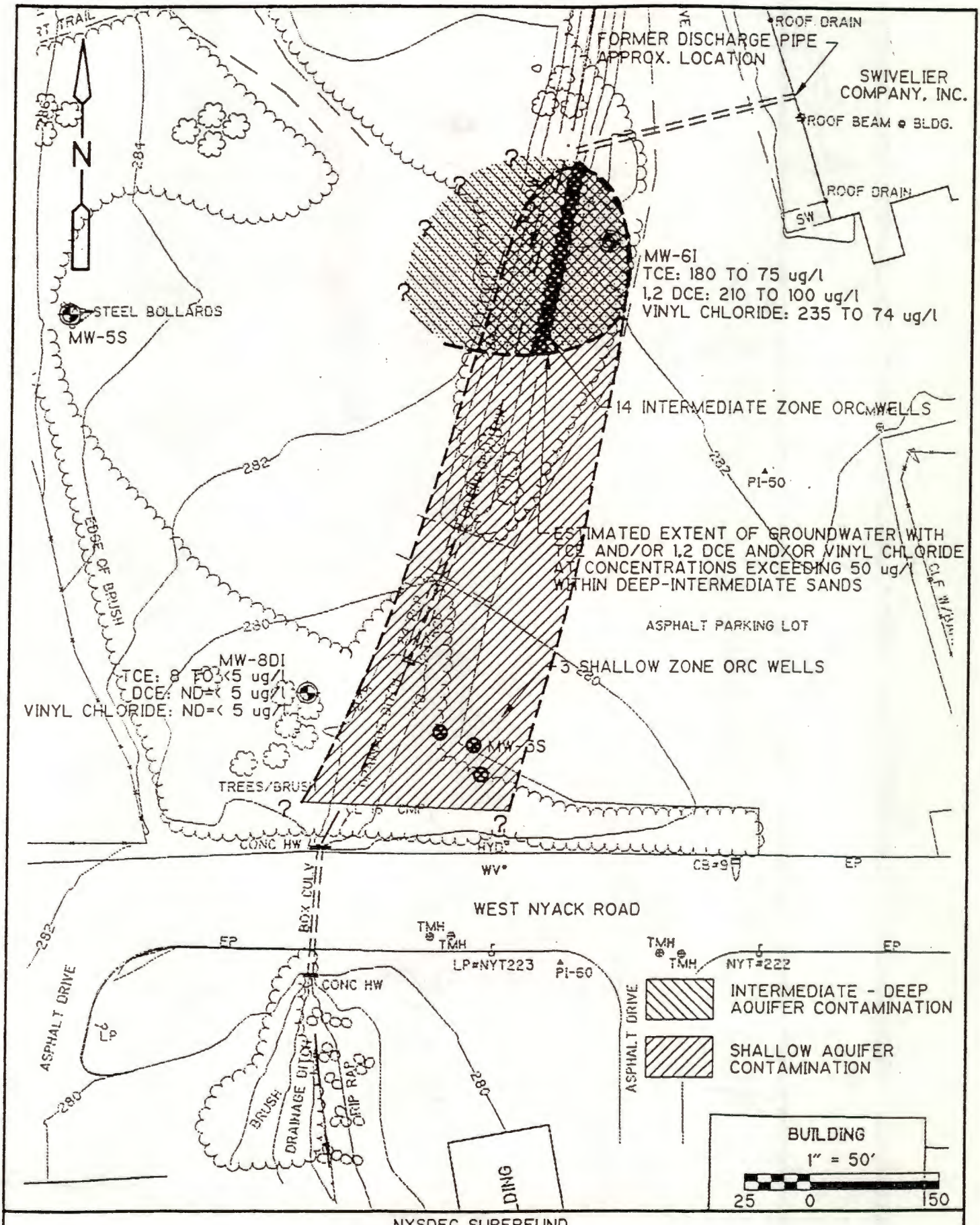


NYSDEC SUPERFUND
SWIVELIER SITE-NYSDEC SITE #3-44-036
NANUET, NEW YORK

MONITORING WELL LOCATIONS

FIGURE 4

CDM
environmental engineers, scientists, planners, & management consultants

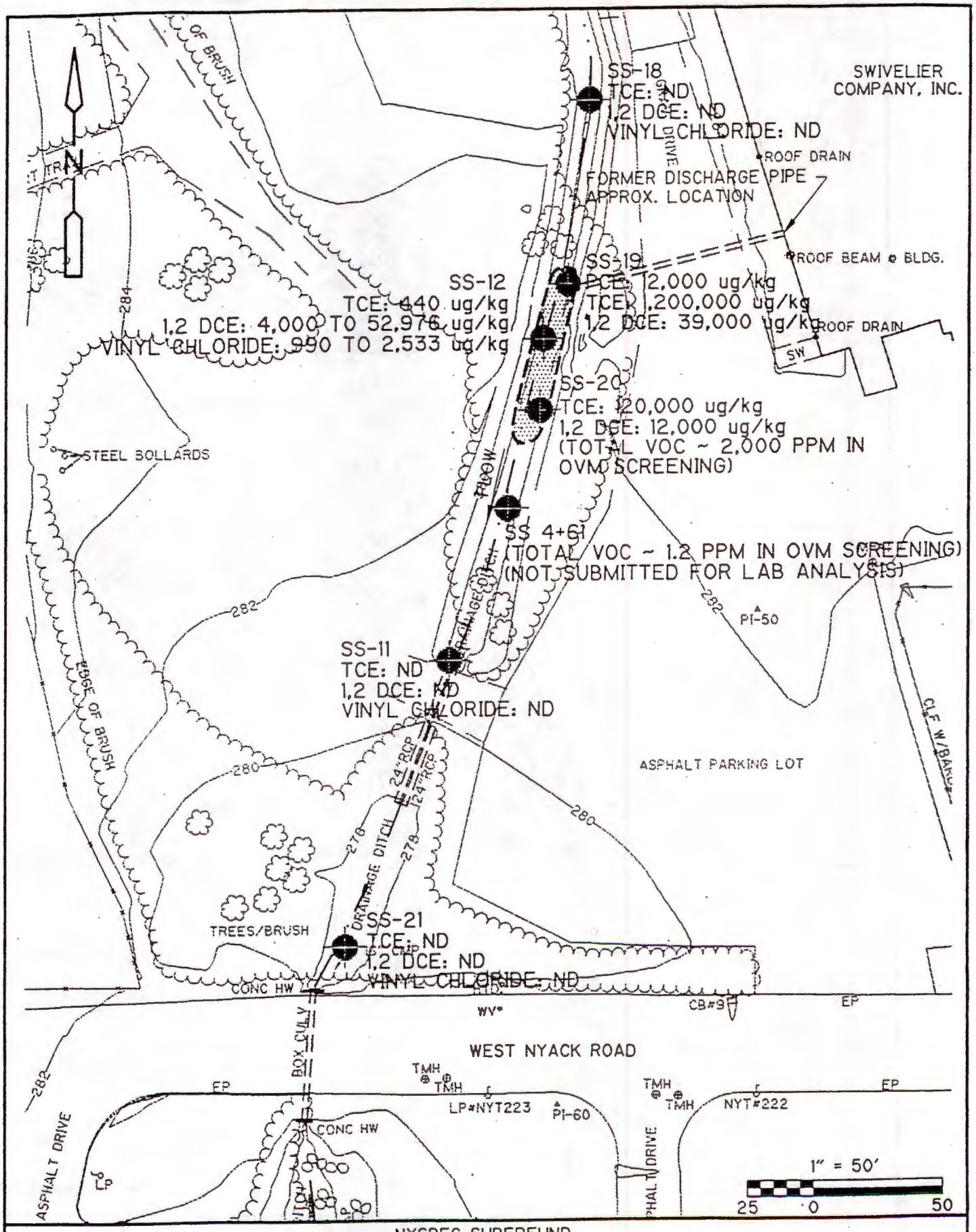


NYSDEC SUPERFUND
SWIVELIER SITE-NYSDEC SITE #3-44-036
NANUET, NEW YORK

CDM
environmental engineers, scientists, planners, & management consultants

ORC WELL LOCATIONS

Figure No. 5



NYSDEC SUPERFUND
SWIVELIER SITE-NYSDEC SITE #3-44-036
NANUET, NEW YORK

SEDIMENT CONTAMINATION ON-SITE 1994 AND 1995

CDM
environmental engineers, scientists, planners, & management consultants

Figure No. 6

TABLES

APPENDIX A

APPENDIX A

RESPONSIVENESS SUMMARY

The New York State Department of Environmental Conservation (NYSDEC) issued the Proposed Remedial Action Plan (PRAP) for the Swivelier Company site on February 16, 1996. The public comment period for the PRAP ran from February 17, 1996 to March 19, 1996. A public meeting was held at 7:30 pm at the Clarkstown Town Hall on March 6, 1996, during the comment period. NYSDEC mailed a fact sheet and notice of the meeting to the media and interested parties listed on the contact list for the site.

Approximately twenty-five people attended the meeting, including representatives from Swivelier, neighboring property and business owners, NYSDEC representatives and our environmental consultant, Camp, Dresser and McKee, and Rockland County Health Department (RCHD) staff. NYSDEC and their consultant briefly summarized the investigations and findings to date, then presented the remedial alternatives and the proposed remedy. A question and answer session then followed.

All questions asked at the public meeting were answered by NYSDEC or their environmental consultant. The following is a summary of the concerns raised at the meeting and the responses provided.

Q. Could you please speak to the vinyl chloride issue?

A. High levels of chlorinated solvents, including vinyl chloride, are present at the site, particularly within soils and sediments which are near the outfall of the discharge pipe. Vinyl chloride is also found in the groundwater. While natural bio-activity is presently breaking down TCE to 1,2 DCE and vinyl chloride, vinyl chloride is very stable in the environment and presents a persistent health concern. Because of the elevated health concerns associated with vinyl chloride and other chlorinated solvents, the PRAP calls for removal of contaminated soils and sediments and long-term groundwater and surface water monitoring. In addition, deed restrictions will be pursued.

Q. How do the vinyl chloride levels at Swivelier compare with other sites in New York State?

A. While the levels of vinyl chloride are high at Swivelier, these high levels are found within a very discreet area, within 30 feet of the outfall. At most sites, vinyl chloride is generally found at low levels but may be distributed over a broad area if it impacts groundwater moving through the site.

Q. Is biodegradation of TCE necessarily good, particularly if vinyl chloride is one of the end products?

A. There is some evidence to show that vinyl chloride may break down to harmless constituents and this was the basis for the Oxygen Releasing Compound (ORC) treatability studies which were conducted during the course of this RI/FS. This study attempted to determine if aerobic degradation is an applicable technology for the breakdown of vinyl chloride. The results of the study were somewhat encouraging in the lab environment but questionable under natural field conditions. So while biodegradation of chlorinated solvents may be beneficial in the long-term, source removal and treatment or disposal are known remedial alternatives which have a proven track record.

Q. Is Swivelier a small scale Love Canal?

A. Swivelier is much less significant compared to Love Canal. The type of contamination at Swivelier is common for the sites listed on the New York State Registry of Inactive Hazardous Waste Sites. The contamination is localized, well defined and technically easy to address at a relatively low cost. It is estimated that approximately 300 cubic yards of soils and sediments are impacted. Love Canal impacts are several orders of magnitude higher.

Q. Swivelier ceased contaminating the environment in 1980. How long had Swivelier been discharging contamination into the environment?

A. The Swivelier operation began in the late 1950s, however we have no information on when contaminant discharges first began on how much contamination made it into the environment.

Q. How many bedrock wells were installed?

A. One was installed in the northern, upgradient area of the site, which was found to be clean. A second bedrock well was installed approximately 70 feet downgradient of the source area. This well had 16 ppb of TCE, marginally above the New York State groundwater standard of 5 ppb.

Q. With only two bedrock wells, you would not be able to determine groundwater flow in this aquifer. Is your assumption for a southwesterly groundwater flow based on regional data and stream flow direction? There are significant groundwater users to the southwest. Did you take into account the fact that horizontal gradients increase closer to water supply wells when calculating contaminant travel times?

A. Our understanding of groundwater flow direction in the bedrock is largely based on regional studies which show a southerly or southwesterly flow pattern. Our fate and transport model is based on hydraulic gradients calculated from slug tests in on-site monitoring wells. These data show very steep horizontal gradients and would be reasonable when modelling a groundwater flow regime which is impacted by water production wells. Based on this, the estimates for groundwater flow rates are thought to be reasonable.

Q. Was there a decision not to put an additional well in between Swivelier and L.A. Woman?

A. DEC had decided not to put an additional well in between L.A. Woman and Swivelier based on a number of factors:

1. The contaminant signature for the L.A. Woman well is much different from contamination at the site. At Swivelier, a significant percentage of breakdown products (1,2 DCE, Vinyl Chloride) is present whereas at L.A. Woman, TCE is virtually the only contaminant present.

2. Surface water and sediment contamination along the drainage ditch which flows between Swivelier and L.A. Woman decreases significantly downstream. In sediments, contaminates are not detected beyond 100 feet downstream. Surface water levels decrease more gradually downstream. At the confluence to Nauraushaun Creek (approximately 0.1 miles upstream of L.A. Woman), total VOC levels were less than 100 ppb, with TCE absent. This contaminant profile of the drainage ditch does not support the argument that this ditch serves as a significant, currently active, contaminant migration pathway to the L.A. Woman.

3. Shallow groundwater wells downgradient of the site, just south of W. Nyack Road, were not significantly impacted by site contaminants. The deep intermediate groundwater well downgradient of the source area was also not significantly impacted by site contaminants.

4. Groundwater movement through the bedrock aquifer is largely controlled by fractures. Under these conditions, contaminants flow is difficult to define, often seeking discrete and unpredictable pathways. Delineation of contaminant migration pathways would be difficult at best given the probable low concentration and large area which represents a potential pathway. Even if contaminants are encountered, consideration would have to be given to the numerous other potential sources within this largely light industrial setting. The question of L.A. Woman and its source of contamination would best be evaluated beginning at L.A. Woman and looking outward. If L.A. Woman has an upgradient source, this approach will provide the quickest answers.

Q. If the L.A. Woman is assumed to have another source, what plans does DEC have for this contaminant problem?

A. DHWR has referred the L.A. Woman to our Bureau of Hazardous Site Control. This is the group within the Division of Hazardous Waste Remediation which investigates sites for addition to the Registry.

Q. If the TCE settled into the lower overburden and bedrock prior to migrating laterally, would the TCE necessarily have broken down to other constituents (1,2 DCE or vinyl chloride) prior to reaching a downgradient receptor?

A. The problem with this argument is that the breakdown products should have followed the TCE migration pathway as they are at least as likely to move with the groundwater as TCE. The breakdown pattern observed in the deep intermediate well adjacent to the source (MW-6I) is consistent with that of the shallow near-source well (MW-6S) indicating that breakdown products are moving with TCE through the environment.

In addition, the breakdown of TCE to 1,2 DCE or vinyl chloride occurs in an anaerobic (without oxygen) environment. Anaerobic conditions exist in the shallow groundwater as well as the bedrock groundwater. Therefore, the same degradation of TCE in bedrock groundwater should occur.

Q. Could the L.A. Woman contamination be acting as a source for bedrock contamination found at the Swivelier site?

A. No. Groundwater would have to flow against its natural southerly gradient to have impacted the Swivelier Site.

Q. What were the highest levels of TCE found in on-site groundwater?

A. The highest level of TCE found in shallow wells was 740 ppb. For intermediate and deep intermediate wells, 180 ppb was the highest level found.

Q. I still have a concern about solving questions related to L.A. Woman and its contaminant source.

A. There is a need to do additional sampling to deal with this problem. However, the money allocated to investigate Swivelier cannot be utilized to study other sites or other potential sources. It is for this reason that the L.A. Woman has been referred to the Bureau of Hazardous Site Control.

Q. You have stated that aquifer data would predict that the shallow groundwater plume would have moved to the southern edge of the site in about 17 years, or about the same span of time since the contaminant release was first discovered (1979), yet you are not sure when contamination actually began.

A. It is possible that contaminant releases took place considerably before 1979. Where the plume currently is shown to dead end at West Nyack Road (with low level contamination south of this road) it is very possible that contaminates have found their way to the utility corridors along this road. These utility lines can often act as significant pathways for water movement because of the gravelly bedding material which is often used. Due to the complexity and risks associated with conducting investigations along these routes, investigation of these potential pathways was not pursued.

Q. How continuous are the till layers on, and in the vicinity of, the site and do you know if there are windows to the bedrock?

A. A cross section of the on-site surface stratigraphy shows the various overburden layers, particularly the deeper layers, to be highly variable and discontinuous. Since our aquifer tests and sample analysis only look at a small portion of the overburden, it is possible that vertical migration pathways exist which allow for more rapid downward migration than our current models predict. However, the very low contaminant levels encountered downgradient at depth support a limited potential for significant and rapid downward movement.

Q. The current monitoring program includes only one upgradient monitoring well. How can you be sure that the contamination is coming from Swivelier?

A. There are some indications that similar contaminants exist upgradient from Swivelier in wells which were installed by Swivelier to monitor soils impacted by some fuel tanks which were removed in 1986-1987. It is possible that these contaminants are related to an alternate source, however, the levels were low in comparison to the levels found near the source area and were not further investigated.

Q. Does your calculated travel time of contaminants into the bedrock coincide with your data?

A. Yes, the data is consistent with a travel time of approximately 15 years.

Q. As a water company, we are concerned about bedrock contamination. If no additional bedrock investigative work can be done under the Swivelier Superfund contract, how can our bedrock concerns be addressed?

A. Some bedrock investigations can be pursued as part of any work conducted to address the L.A. Woman. If other sources are identified in the area, additional work would be justified. In addition, the Rockland County Health Department would be interested in sampling any private wells in the area. Please get in touch with RCHD at (914)364-2608.

Q. We would like to see an additional set of monitoring wells to the southwest to insure that this potential pathway for contaminant migration is monitored for off site impacts.

A. Our long-term monitoring plans calls for an additional monitoring point to the southwest to insure that this potential off- site pathway is covered.

Q. Will the public have an opportunity to comment on the remedial design?

A. Typically we don't send out the design plans for public comment, however, the RCHD will have an opportunity to review this information. In addition, you are welcome to call us any time (our phone numbers are on the public notice and the PRAP) during the remedial process for an update, comments or questions on the status of the project.

Q. Was the drainage ditch a natural stream or a man-made channel.

A. The current channel is largely man-made. Prior to the several modifications which took place over the years, it was a minor natural channel which flowed through wetlands.

Q. For the record, my preference would be to truck the contamination off site rather than on-site treatment.

A. Acknowledged.

Q. The air regulations currently allow for 5 ppm levels of vinyl chloride during remedial activities before any actions are taken. I feel this level is too high and would like to see a more stringent value used.

A. Because a high level of vinyl chloride is present in soils at the site, remedial work may need to be conducted in Level B protection which includes the use of supplied air. Perimeter monitoring of vinyl chloride will be done throughout construction activities. The federal action level for vinyl chloride is 5 ppm while the State short-term Guideline Concentration for vinyl chloride is 0.5 ppm. Real-time monitoring will include the use of Draeger tubes with a sensitivity of 0.5 ppm. If levels of vinyl chloride exceed 0.5 ppm at the exclusion zone, work will stop and actions will be taken to mitigate this contaminant release through the use of vapor suppressors or other acceptable methods.

Written Comments

Q. Based on the results of the Remedial Investigations (RI's) conducted to date at the site four groundwater bearing formations (three of which are loosely identified as "aquifers") have been identified underlying the Swivelier site. The uppermost three formations reportedly correspond to separate unconsolidated deposits of glacial origin ("shallow," "intermediate" and "deep-intermediate"). Underlying these formations are the bedrock units of the Brunswick Group, which is the only true aquifer in the vicinity of the site. The RI identifies these units as the bedrock aquifer.

Groundwater flow direction has only been adequately delineated in the shallow aquifer, reflecting a general orientation towards the southwest. There is an insufficient number of monitor wells tapping the intermediate aquifer to determine groundwater flow west of the drainage ditch. Only two monitor wells tap the deep-intermediate aquifer and the bedrock aquifer, therefore flow direction cannot be determined.

The current PRAP recommends limited groundwater monitoring based on the assumption that significant groundwater contamination has not migrated off the site relative to nearby community production wells [e.g., United Water Company of New York (UWNY) production wells]. Based on the existing hydrogeologic information, especially the lack of adequate flow-direction and historical groundwater level data for the intermediate, deep intermediate and bedrock aquifers this aspect of the PRAP is not justified.

Groundwater flow direction in the Brunswick Group bedrock aquifer can be adequately characterized and has been by Leggette, Brashears and Graham, Inc. (LBG) as part of numerous investigations conducted over the past five decades for UWNY in Rockland County. The results of previous investigations conducted by LBG and the NYSDEC at the UWNY Spring Valley Well Field have shown that groundwater flow direction (and contaminant migration pathways) in the Brunswick Group bedrock aquifer under pumping and non-pumping conditions potentially differ and can be determined with an adequate number of groundwater level monitoring points. In addition, the results of that same investigation confirmed the significant role that leakage of surface water and leaching from sediments played in transporting TCE from a remote location to the Spring Valley Well Field (a bedrock groundwater supply).

It is LBG's opinion that at a minimum additional monitor wells should be installed in the intermediate, deep-intermediate, and bedrock formations, and monitored over the course of several months to adequately determine the groundwater flow direction in the aquifers beneath the site relative to off-site properties and production wells (e.g., UWNY Nanuet Wells 13 and 14, Bardonia Well, Germonds Well). This work should be completed and evaluated prior to finalizing the PRAP for the Swivelier site.

A. The ROD includes the installation of one additional cluster of monitoring wells to the southwest of the source area to monitor this potential off site migration pathway. This cluster will include a deep-intermediate and bedrock monitoring well. These additional monitoring points will also allow us to better determine groundwater flow direction in these deeper horizons as it will provide a third point with which to triangulate groundwater flow in the deep-intermediate and bedrock zones.

Q. The NYSDEC has indicated that the Standards, Criteria and Guidelines (SCGs) for TCE in groundwater is 5 micrograms per liter (ug/1). According to the results of the RI, TCE has been detected in the shallow, intermediate, deep-intermediate and bedrock aquifers beneath the Swivelier site at concentrations at or above 5 ug/l. Since the PRAP only addresses the removal of the most highly-contaminated soils at the site, a significant amount of contaminated soils will remain in place without active treatment (especially at depths many tens of feet below land surface). Based on calculations presented by CDM in the respective RI's, these soils (which occur within the various unconsolidated formations underlying the site) will remain a source of groundwater contamination for a significant amount of time before biodergradation can reduce the concentrations. Therefore, VOC's occurring at the site at concentrations above the respective SCGs will continue to migrate vertically and laterally if only groundwater monitoring is implemented as a remedial action.

These same contaminated soils, if not remediated, are a concern to UWNY since the reviewed groundwater elevation data indicate that the contaminated unconsolidated deposits aquifers recharge the Brunswick Group bedrock aquifer. It should be noted that the RI's indicate that the Brunswick Group bedrock aquifer underlying the site is currently contaminated with TCE at concentrations above the SCG.

The Brunswick Group bedrock aquifer is a major source of potable groundwater for most Rockland County residents. As indicated earlier, UWNY currently utilizes production wells which tap the Brunswick Group bedrock aquifer at three locations near the Swivelier site. Water pumped from one of these wells is known to be persistently contaminated with TCE and has been removed from service. In addition to UWNY, there are also several industrial (e.g., Lederle Laboratories) and private wells which also tap the Brunswick Group bedrock aquifer in the vicinity of the Swivelier site. Given that UWNY is always considering the purchase of favorable yielding wells or development of potentially favorable well sites in order to supplement it's already limited public water supply, the proposed monitoring of groundwater quality as a remedial effort is potentially restrictive to the increasing water needs of the community.

A. We agree that the groundwater monitoring plan as described in the PRAP is lacking in terms of monitoring potential off site migration in the southwesterly direction. As indicated in the previous response, this concern will be addressed. The data collected at the site so far does not show any strong indications for significant migration from the

source in the deep-intermediate and bedrock aquifers. If the groundwater monitoring program at any time indicates off site migration of contaminants at levels of concern, the ROD indicates that other remedial options will be evaluated.

Q. The PRAP recommends deed restrictions at the Swivelier site prohibiting the use of groundwater. This proposed remedial action appears to be based on the assumption that contamination has not significantly migrated from beyond the site boundaries. Given that the discharge of TCE and affiliated VOC's to the drainage ditch probably started as early as 1956, the resulting TCE plume (or portions thereof) has most likely migrated (or potentially will migrate) laterally and vertically to locations beyond the current monitoring well network (especially with respect to the deeper unconsolidated aquifers and the bedrock aquifer). The unimpeded migration of this plume could adversely affect nearby groundwater users.

It should be noted that the specific capacity (0.04 gallons per minute per foot of drawdown) and hydraulic conductivity (1.75×10^{-4} feet per minute) values presented in the RI by CDM for the portion of the Brunswick Group Bedrock aquifer tapped by Monitor Well MW-6R are anomalously low. The groundwater transmissibility characteristics for the Brunswick Group bedrock aquifer in that area, on the average should be several orders of magnitude greater than those reported for Monitor Well MW-6R. Assuming the higher transmissivity values typically associated with this aquifer in the Nanuet area, faster contaminant migration rates would be expected. Since there is only one monitor well tapping the contaminated bedrock aquifer at the Swivelier site, the contaminant migration calculations utilized in the RI to estimate downgradient concentrations southwest of the site (and support the PRAP) should not be considered conservative, but extremely liberal.

A. Should contaminants be migrating off site in the one direction (southwest) that is currently not being adequately monitored, the current long-term monitoring plan should see this. As indicated, if off site migration is found to be occurring at levels of concern, other remedial options will be evaluated.

Q. One of the assumed goals of the PRAP is to ultimately maintain the groundwater constituent concentrations at or below SCGs. Based on the results of the RI's and the PRAP, this will not occur in the near future. At the Swivelier site, the distribution of TCE and affiliated VOC's in the intermediate, deep intermediate and bedrock aquifers has not been sufficiently characterized. A sufficient number and distribution of monitor wells tapping these formations do not exist to adequately determine the nature and extent of the plume with respect to TCE in the groundwater at concentrations at or below the SCGs. The installation and monitoring of additional monitor wells, as discussed above, should

be implemented before the NYSDEC finalizes the PRAP. Since it has been recommended by the NYSDEC to leave contaminants in the site groundwater at concentrations above SCGs (making the water non-potable), it is necessary to make sure that the entire contaminant plume attributable to this site has first been characterized and the potential off-site impacts identified.

A. While the Department agrees it is prudent to monitor groundwater quality southwest of the Swivelier Site as part of our long-term monitoring requirements, we do not believe it would be prudent to delay the remediation of the contaminated soils and sediments at the site while waiting for groundwater results. We believe the wells to the southwest, once tested, will demonstrate that the Swivelier related contamination has not caused significant off site impacts in that direction.

Q. The Rockland County Health Department (RCHD) is very concerned about the proposed groundwater preferred remedy of "No Action, Access (Deed) Restrictions on Site, Groundwater/Surface Water Monitoring."

The problem which initiated this listing still exists: high concentrations discovered by this Department in the groundwater at L.A. Woman in 1991. Although the Department has discovered no new groundwater users in the immediate area, we are concerned about the high concentration remaining in this highly productive aquifer, and the migration of that contamination.

It is the opinion of the Department that further subsurface work be done to determine the nature and extent of contamination at the L.A. Woman site.

Furthermore, it is difficult to assess the comprehensiveness of the preferred remedy without the specifics of the groundwater monitoring portion. The public meeting presentation described the installation of another well as part of the groundwater monitoring. Sampling the L.A. Woman well, establishing groundwater flow direction, and an opportunity to re-open the decision in this matter should be incorporated into that portion. This Department requests the opportunity to review the design of the groundwater monitoring.

A. As indicated previously, the L.A. Woman has been referred to our Bureau of Hazardous Site Control for further followup and investigation. The RCHD will be included on the distribution list for future design of groundwater monitoring activities. This design will include the installation of an additional monitoring well cluster to the southwest of the source. Should the long-term monitoring program reveal significant off-site impacts, the groundwater portion of the remedial action will be reevaluated.

APPENDIX B

APPENDIX B

ADMINISTRATIVE RECORD

1. Record of Decision - Swivelier Site - prepared by the New York State Department of Environmental Conservation, March 1996

2. Proposed Remedial Action Plan - Swivelier Site - prepared by the New York State Department of Environmental Conservation, February, 1996

3. Phase II Remedial Investigation and Phase III Feasibility Study Report - Swivelier Site, Two Volumes - prepared by Camp, Dresser and McKee, February 1996

4. Phase II Remedial Investigation Work Plan - prepared by Camp, Dresser and McKee, June 1995

5. Phase I Remedial Investigation and Phase I and II Feasibility Study Report - Swivelier Site, Two Volumes, prepared by Camp, Dresser and McKee, June 1995

6. Remedial Investigation/Feasibility Study Work Plan - Swivelier Site, prepared by Camp, Dresser and McKee, May 1994

7. Site Operations Plan/Quality Assurance Project Plan for the Remedial Investigation/Feasibility Study- Swivelier Site, prepared by Camp, Dresser and McKee, April 1994

8. Remedial Investigation Report, Swivelier Company, Inc., Two Volumes, prepared by Subsurface Investigations, November 1993