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STUART-OLVER-HOLTZ

Town of Henrietta, Monroe County, New York
Site No. 8-28-079

PROPOSED REMEDIAL ACTION PLAN

January 1997

Prepared by:

Division of Environmental Remediation
New York State Department of Environmental Conservation

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SECTION 1: PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) is proposing **Site Wide Alternative #5** for the Stuart-Olver-Holtz (SOH) site. This remedy is proposed to address the threat to human health and the environment created by the presence of elevated levels of contaminants in the on-site groundwater and surface soils. **Site Wide Alternative #5** would consist of several actions: a short term, source area extraction system for higher level contaminants found in the area around well OW-7S; a down gradient collection trench system for contaminated overburden groundwater; passive pretreatment of contaminated groundwater by zero valence iron and discharge to the local Publicly Owned Treatment Works (POTW); isolation and/or excavation and off-site disposal of contaminated surface soils; construction of minor drainage improvements; and restoration of the excavated areas. If necessary, a barrier wall would be constructed to help the collection trench achieve hydraulic containment of contaminated overburden groundwater. Bedrock groundwater would be addressed by institutional controls.

This Proposed Remedial Action Plan (PRAP) identifies the preferred remedy, summarizes the other alternatives considered, and discusses the rationale for this preference. The NYSDEC will select a final remedy for the site only after careful consideration of all comments submitted during the public comment period.

The NYSDEC has issued this PRAP as a component of the citizen participation plan developed pursuant to the New York State Environmental Conservation Law (ECL) and 6 NYCRR Part 375. This document summarizes the information that can be found in greater detail in the Remedial Investigation (RI) and Feasibility Study (FS) reports available at the document repositories.

The NYSDEC may modify the preferred alternative or select another alternative based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives identified here and in the Feasibility Study.

To better understand the site, and the alternatives evaluated, the public is encouraged to review the project documents which are available at the following repositories:

Town of Henrietta, Town Library
455 Calkins Road
Henrietta, New York 14467
(716) 359-7092

NYSDEC - Central Office, Albany
50 Wolf Road, Room 242
Albany, New York 12233-7010
(518) 457-5636
Attn: Salvatore F. Priore, P.E.
Project Manager

NYSDEC-Region 8 Office
6274 East Avon-Lima Road
Avon, New York 14414
Attn: Mr. Joseph Hamm
(716) 226-2466

Written comments on the PRAP are encouraged and should be submitted to Mr. Salvatore F. Priore, P.E. at the above address.

DATES TO REMEMBER:

January 23, 1997 through February 24, 1997 - Public comment period on the PRAP and preferred alternative.

February 12, 1997 - 7:00 p.m. Public Meeting
Town of Henrietta, Town Hall
475 Calkins Road, Henrietta, N.Y.

SECTION 2: SITE LOCATION AND DESCRIPTION

The approximately 3.8 acre site is located at 39 Commerce Drive, in a mixed commercial-industrial area of the Town of Henrietta, Monroe County, New York (See Figure 1). A manufacturing building occupies the eastern half of the site. The remaining area consists of a paved parking lot, driveways and grass covered areas. Immediately to the west is a weed and brush covered area with a swale that drains the site.

The site is bounded on the east by several small businesses: on the west by Pullman Manufacturing; on the south by Ruby Gordon property; and on the north side by Commerce Drive and several commercial properties, including a former Town of Henrietta Fire Station.

The site is located within the Red Creek drainage basin. Red Creek is located about ½ mile north and west of the site and flows into the Erie Canal about 2 miles north of the site. The westernmost portion of the site is located within the 100 year floodplain of the creek.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The Stuart-Olver-Holtz site was first developed from farm land in 1962 as Electro Chemical Products, Inc., a company formed by Maury H. Ryan and others. The company evolved into Stuart-Olver-Holtz, Inc. (SOH) as the business and properties were passed on to successors. SOH operated a specialty finishing business which included painting, conversion coating and metal plating of parts on a contract basis. In 1974 a fire occurred at the site, destroying a portion of the facility and also causing the release of plating and coating solutions into the environment.

In 1980 SOH applied for a permit to operate a solvent recovery unit at the facility and began accumulating drums of waste solvents for processing. Due to regulation changes, the permit was not issued, however SOH had accumulated a substantial volume of waste in the interim. Subsequently the NYSDEC issued an enforcement order against SOH requiring removal of the drums, some of which had been observed to be leaking. In August 1983 SOH removed some 200 drums from the site, but more than 100 remained. The accumulation of drums has since been a recurring problem at this facility. After efforts to have SOH complete a clean up of the site were not successful, the site was listed as an inactive hazardous waste disposal site with a Class 2 designation.

In 1986 SOH filed a Chapter 11 Bankruptcy petition. A plan for business reorganization was approved by the court that entailed transfer of the manufacturing facility to Metalade, Inc. Metalade established SOH Acquiring, Inc. to hold title to the facility and then leased it back from this holding company. Metalade conducts the same type of manufacturing operations at the facility as had SOH. A separate parcel of the property is still owned by principals of the original SOH, however, SOH as a corporation was dissolved. Environmental assessments of the site made in conjunction with this transfer confirmed the presence of soil and groundwater contamination at the site.

Adjoining the property to the south is Ruby Gordon, Inc., a furniture sales and warehousing enterprise. Ruby Gordon applied for a NYSDEC permit to discharge groundwater collected from basement sumps to a nearby surface drainage ditch. Due to the proximity to the SOH site and the presence of Volatile Organic Compounds (VOCs) there, Ruby Gordon was required to analyze its sump water for VOCs. Because of VOC contaminant levels found in the sump water, this water is now pretreated and then discharged to the Monroe County Pure Waters POTW.

3.2: <u>Remedial History</u>

In April 1985 and again in March 1986, the NYSDEC conducted an inspection of the SOH Facility. During those inspections several chemical containers and drums were observed unprotected outside of the facility, in the southwestern portion of the site. Container and drum contents were reported to consist of 1,1,1-Trichloroethane, etching waste, Methylene Chloride, waste thinner, nickel stripping solution, plating waste paint, and other solvents. The inspection also revealed the presence of three large dumpsters containing electroplating sludge outside of the SOH facility.

In 1987, a Site Assessment was conducted by SOH. Based on the results of this investigation, the following conclusions were reached:

- Groundwater flow in the overburden aquifer is generally towards the west to northwest.
- Volatile Organic Compounds (VOCs) were discovered in soil samples collected from the southwestern portion of the site, particularly in the vicinity of the drum storage area.
- VOCs were found in the three new monitoring wells in the southwestern portion of the site.
- VOCs were found in the two existing on-site production wells. Due to the lack of information about construction of these wells and indications that they may be screened at a different interval than the newly installed monitoring wells, the source of contamination and the direction of bedrock flow at these locations could not be determined.

In April 1991, Ruby Gordon conducted hydrogeologic investigations of the Ruby Gordon property to determine if SOH was contributing to contaminants detected in the Ruby Gordon basement sumps. This study concluded that contaminants found in water from the three basement sumps were attributable to contaminated groundwater migrating from the SOH site.

SECTION 4: <u>CURRENT STATUS</u>

In response to a determination that the presence of hazardous waste at the Site presents a significant threat to human health and/or the environment The NYSDEC has recently completed a Remedial Investigation and Feasibility Study (RI/FS). A Final RI Report, entitled "*Remedial Investigation Report, Stuart-Olver-Holtz Site, Henrietta, New York, September 1996*" has been prepared describing the field activities and findings of the RI in detail. A Final FS Report, entitled "*Feasibility*

Study Report, Stuart-Olver-Holtz Site, Henrietta, New York, October 1996" has also been prepared to identify and evaluate remedial options for site cleanup.

4.1: Summary of the Remedial Investigation

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

The RI was conducted in two phases. Field work for the first phase was conducted between October 3, 1994 and December 6, 1994. Field work for a supplemental phase conducted between June 19, 1995 and October, 1995.

The RI included the following activities:

- Geophysical survey
- Soil vapor survey
- Air sampling during intrusive activities
- Test pit excavations
- Installation and sampling of soil borings
- Installation and sampling of overburden monitoring wells
- Installation and sampling of top of rock monitoring wells.
- SOH interior bedrock supply well assessment and sampling
- Hydraulic conductivity testings and groundwater level measurements
- Drainage swale surface water and sediments sampling
- Surface soil sampling
- Catch basin/sump sampling
- Ruby Gordon basement sump sampling
- Private well survey

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, RI data was compared to environmental Standards, Criteria, and Guidance (SCGs). Groundwater and surface water SCGs identified for the Stuart-Olver-Holtz (SOH) site were based on NYSDEC Ambient Water Quality Standards and Guidance Values. NYSDEC Technical Assistance Guidance Memorandum (TAGM) 4046 and guidance from the New York State Department of Health were used to evaluate site soils. NYSDEC TAGM 3028 "contained in criteria" was used for characterization of soil, sediment and groundwater for disposal purposes. USEPA Risk-Based Remediation Criteria and Preliminary Remedial Goals (PRGs) 1993 were also used as SCGs for soil and groundwater.

The RI identified a probable source area where levels of contamination in overburden groundwater were much higher than groundwater standards. This area is near the Metalade loading docks where well OW-7S was installed and where the most significant concentrations of contaminants of concern were detected in the two rounds of groundwater sampling conducted. Significant concentrations of chemicals of concern were also detected in the OW-6S area, where drums were historically stockpiled and where overburden groundwater may be migrating from the OW-7S source area due to the influence of the gradient induced from the Ruby Gordon basement sumps. The OW-7S source area along with the OW-6S area contribute to a larger contaminated groundwater plume found migrating in the overburden towards the northwest and south towards Ruby Gordon. Contaminant levels in the northwest overburden plume near the SOH property are also quite high, with well OW-3S also containing levels well above groundwater standards.

There are discontinuous areas where the surface soils have been contaminated to levels of concern, presumably by chemical spills and migration that occurred over the years of operation at this facility. Top of Bedrock groundwater immediately beneath the site also showed some contamination at levels of concern.

Based upon the results of the Remedial Investigation (RI), comparison to SCGs, and evaluation of potential human and environmental exposure routes, areas of contaminated overburden groundwater, surface soils and sediments at the site were identified that warrant remediation. The results of the RI are summarized below. More complete information can be found in the Final RI and FS Reports.

Concentrations of contaminants in groundwater are reported in parts per billion (ppb). Concentrations of contaminants in soils and sediments are reported in parts per million (ppm) for inorganics (metals) and in ppb for organic compounds.

4.1.1 Nature of Contamination:

As described in the Remedial Investigation (RI) Report, soil, groundwater, surface water, and sediment samples were collected to characterize the nature and extent of contamination at the site. Various samples were analyzed for Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), pesticides and Poly-Chlorinated Biphenyls (PCBs), cyanide based compounds and inorganics (metals).

Analytical results from the RI indicate the presence of elevated concentrations of VOCs, SVOCs, and metals in environmental media in and around the SOH site. Numerous chlorinated VOCs and metals were detected at concentrations above applicable Standards, Criteria and Guidance (SCGs) values in overburden groundwater (including water samples from the Ruby Gordon basement), in bedrock groundwater (including the samples from the SOH interior bedrock wells), in subsurface soils, and in water and sediment samples from sumps and catch basins. The compounds detected are typical for sites where plating, finishing and painting wastes were disposed or spilled.

Overburden groundwater appears to be the media with the most significant concentrations of chlorinated VOCs. The highest concentration of chlorinated VOCs was detected in the on-site well OW-7S near the loading dock area. In this well Trichloroethene was reported at up to 140,000 ppb, 1,1,1 Trichloroethane was reported up to 24,000 ppb, 1,1 Dichloroethane was reported up to 10,000 ppb, and Vinyl Chloride was reported up to 11,000 ppb. Monitoring well OW-6S, located in the southwest area of the site near where drums had historically been stored, contained similar VOCs and metals at very high levels. (See Figure 2 for monitoring well and sampling locations).

In the down gradient (northwest) plume, groundwater samples from well OW-3S showed lower but still significant levels of VOCs, with 1,2 Dichloroethene (DCE) (total) reported at up to 4,800 ppb, Vinyl Chloride (6,200 ppb); Trichloroethene (800 ppb); and Tetrachloroethene (1,500 ppb).

SVOCs were found at concentrations above SCGs in samples of surface soils and water from site sumps and catch basins. The most significant levels of SVOCs found were Poly-Aromatic Hydrocarbons (PAHs) detected in samples of the surface soils from on-site. The presence of high PAH levels in surface soil was sporadic, with some areas found above levels of concern, and other areas found below levels of concern.

Metals were detected at concentrations above SCGs in samples obtained from the overburden groundwater, bedrock groundwater, subsurface soils, surface water and in water and sediment from site sumps and catch basins. The more frequently encountered metals include cadmium, chromium, copper, lead, mercury, nickel, and zinc.

No Poly-Chlorinated Biphenyl compounds (PCBs) were detected during the RI.

4.1.2 Site Geologic and Hydrogeologic Summary

The site geology and hydrogeologic setting are generally consistent with regional conditions. The site overburden consists of fill soils, which overlie (in descending order) lacustrine silt and clay and glacial till. The glacial till consists of an upper unit which was relatively less dense and sandy and a dense lower till unit which contains a greater percentage of clay and silts. The glacial till deposit is the most prevalent overburden deposit encountered at the site and the upper till unit appears to be the primary water bearing unit in the overburden.

Bedrock underlying the glacial till is the Vernon Formation. The top of bedrock consists of weathered shale and is the second water bearing unit encountered during the RI at the site.

The overburden groundwater and top of bedrock groundwater appear to be under semi-confined conditions at the site. However, unconfined overburden groundwater conditions may exist at the site where the thickness of the overlying lacustrine deposit is absent or too thin to provide a semi-pervious layer. The top of bedrock groundwater hydrogeologic conditions at the site are also apparently represented by semi-confined conditions. The top of bedrock groundwater is bounded above by the semi-pervious (low permeability) lower glacial till.

The overburden groundwater at the site flows in a north to northwest direction. However, during periods of high groundwater, a southward component of groundwater flow was observed along the Ruby Gordon property line in the vicinity of the building's basement (finished floor elev. 521.77). This southward flow direction is apparently induced when the basement sumps are pumping.

The top of bedrock groundwater flow direction is generally towards the northwest. The bedrock groundwater gradients are relatively consistent between the low and high groundwater flow conditions measured at the site.

4.1.3 Extent of Contamination

Tables 1 through 9 summarize the contaminant findings for soils, groundwater, surface water, sediments, and sump samples and compares the data with the proposed SCGs for the site. The following are the media which were investigated and a summary of the findings of the Remedial Investigation (RI).

Soils (subsurface)

A total of forty-one (41) subsurface soil samples were collected during the RI. Thirty-five (35) subsurface soil samples were collected from the split spoon samples during the test borings and monitoring well installations. Six (6) composite subsurface soil samples were collected from the test pit excavations.

Analyses of the subsurface soil samples showed that Volatile Organic Compounds (VOCs) were below SCGs. Semi-Volatile Organic Compounds (SVOCs), including total PAHs, were below the respective SCGs. Inorganics, except Arsenic, were also below SCGs. Arsenic levels slightly above SCGs appropriate for protection of groundwater were found in two samples. However, Arsenic was not found above SCGs in any groundwater samples from the site. As such, Arsenic found in these two subsurface soil samples and at similar levels in two surface soil samples is not considered a contaminant of concern for this site. Table 1 summarizes contaminant findings for these soils.

Soils (surface)

Eight (8) surface soil samples were collected during the RI at depths ranging from 1 to 6 inches. Surface soil samples SS-1, SS-2, and SS-3 were collected to evaluate spills which may have impacted the surface soils at the site. Surface soil samples SS-4, SS-5, and SS-6 were collected from off site locations to represent background concentrations. Surface soil samples designated as SED-1 and SED-4 were collected near the drainage swale at the western edge of the property.

No VOCs were detected in surface soils at or above SCGs. SVOCs, primarily PAHs, were detected above SCGs at two locations. The more significant individual PAHs detected included: Benzo(a)Anthracene, Chrysene, Benzo(b) Fluoranthene, and Benzo(a)Pyrene. Total PAH concentrations of 197,520 ppb at location SS-3 and 741,500 ppb at SS-1 were above the SCG for total PAHs. Inorganics, except for Cobalt and Lead were below SCGs. Cobalt and Lead slightly above SCGs were found in one sample. No pesticides or PCBs were detected. Table 2 summarizes contaminant findings for the surface soils.

Sediments (on-site sump/catch basin)

Two (2) on-site sump and catch basin samples, NSM-2 and NSM-3, were collected during the RI to characterize contamination of site drainage structures. Several VOC's were found to exceed SCGs, including: 1,1,1-Trichloroethane (at a maximum concentration of 2,000,000 ppb); Tetrachloroethene (max 91,000 ppb); Toluene (max 110,000 ppb); and total 1,2 Dichloroethane (max 17,000 ppb). SVOC's consisting mainly of PAHs were detected, however, the maximum total PAH concentration of 131,690 ppb did not exceed the respective SCG. Several inorganics were also found above SCGs, including: Cadmium (max 63 ppm); Chromium (max 714 ppm); Copper (max 355 ppm); Nickel (max 983 ppm); and Selenium (max 89 ppm). Table 3 summarizes the contaminants of concern for sump sediments.

Surface Soils (swale area)

Two (2) surface soil samples were collected during the RI. These samples were taken from the drainage swale on the western edge of the property. Samples SED-2 and SED-3 were collected at corresponding surface water locations SW-2 and SW-3. Though labeled as sediments, these samples were from an intermittent drainage swale and are more appropriately considered surface soil samples. As such, SCGs for surface soils are considered instead of sediment SCGs.

No VOCs were detected in these samples at or above SCGs. SVOCs detected consisted of mainly PAHs. The maximum total PAH concentration at location SED 3 (220,830 ppb) was the only location to exceed the SCG for PAHs. Inorganics except for Zinc (max 844 ppm), Nickel (max 26 ppm)and Copper (max 68 ppm) were below their respective SCGs. Table 4 summarizes contaminant findings for these samples.

SOH Sump/Catch Basin Water

Two (2) water samples from on-site sumps and catch basins were collected and analyzed during the RI. These samples, NSM-1 and NSM-4 were collected to characterize contamination of on-site drainage structures.

High levels of VOCs were detected in these water samples. VOCs found above SCGs included: 1,1 Dichloroethane (maximum 72,000 ppb); 1,1,1 Trichloroethane (max 7,900 ppb); Toluene (max 5,800 ppb); Ethyl benzene (max 2,700 ppb); and total Xylene (max 15,000 ppb). One SVOC, Phenol (max 360 ppb) was found above its respective SCG. Several inorganics were detected above SCGs, including Aluminum (max 15,700 ppb); Antimony (max 111 ppb); Cadmium (max 4,430 ppb); Chromium (max 4,940); Copper (max 3,580 ppb); and Lead (max 696 ppb). Table 5 summarizes contaminant findings for these water samples.

Ruby Gordon Basement Sump Water

Water samples were collected from the three Ruby Gordon basement sumps in two separate sampling events during the RI.

Several VOCs were found in these sump samples in both sampling events. Exceedances of SCGs were found for the following compounds: 1,1,1 Trichloroethane (maximum 2,000 ppb); total 1,2

Dichloroethene (max 590 ppb); Tetrachloroethene (max 150 ppb); 1,1 Dichloroethane (max 630 ppb); Methylene Chloride (max 84 ppb); and Vinyl Chloride (max 30 ppb).

No SVOCs were detected at or above SCGs during the first sampling event. SVOCs were not analyzed during the second sampling event. No metals were found at or above SCGs in the first sampling event, therefore they were not analyzed in the second sampling event. There were no detection of pesticides or PCB's in these samples. Table 6 summarizes contaminant findings for the Ruby Gordon sump.

Overburden Groundwater

Overburden groundwater samples were collected from sixteen (16) monitoring wells during two sampling rounds of the RI, to characterize the overburden groundwater at the site. In general, overburden groundwater was found to contain significant contaminant levels next to the Metalade building, near well OW-7S and the loading dock. This area represents a probable source area, though subsurface soil data does not confirm this. It is possible that the actual source is under the Metalade building, or that the limited number of soil borings simply missed the source area. However, a contaminant plume with levels well above SCGs extends to the west and northwest from this area. Contaminated overburden groundwater was also found to be migrating southward, towards the Ruby Gordon property, most likely in response to gradients created by the sump pumps in the Ruby Gordon basement.

VOCs were found in both rounds of overburden groundwater at levels well above SCGs. VOCs found to exceed SCGs during Round 1 include: Vinyl Chloride (max 11,000 ppb); Trichloroethene (max 140,000 ppb); total 1,2 Dichloroethene total (max 10,000 ppb); 1,1,1 Trichloroethane, (max 24,000 ppb); 1,1 Dichloroethane (max 10,000 ppb); 1,1 Dichloroethene (max 900 ppb); and Tetrachloroethene (max 8,800 ppb). During Round 2 VOCs found at or above SCGs included: Trichloroethene (max 140,000 ppb); 1,2 Dichloroethene (total) (max 9,300 ppb); 1,1,1 Trichloroethane (max 14,000 ppb); Tetrachloroethene (max 4,300 ppb); 1,1 Dichloroethane (max 7,800 ppb) and 1,1 Dichloroethene (max 260 ppb). There appears to be a consistent spatial trend of overburden contamination to the northwest and south as evidenced by the two rounds of sampling.

SVOCs were analyzed in the Round 1 sampling event, but were not found above their respective SCGs. Only well OW-7S was resampled for SVOCs during Round 2. Again no SVOCs were detected at or above SCGs.

Inorganics were analyzed in both sampling rounds. In Round 1 the metals found above SCGs included: Aluminum (max 14,900 ppb); Manganese (max 1,420 ppb); and Nickel (max 169 ppb). The Round 2 sampling detected similar metals, but generally at lower levels. No spatial trends in metals contamination were apparent from the two rounds of sampling.

No pesticides or PCBs were detected in either sampling round. Table 7 summarizes contaminant findings for the overburden groundwater.

Bedrock Groundwater

Top of Bedrock Monitoring Wells:

Groundwater samples were collected from five (5) top of bedrock wells that were installed during the RI. Two sampling rounds were conducted. In general, bedrock groundwater was found to contain higher contaminant levels near the manufacturing facility, but with rapidly decreasing levels away from the building. Most of the maximum SCG exceedances were from well OW-7R, located near the facility's loading docks and the presumed overburden source area.

Several VOCs were found in bedrock groundwater at or above SCGs during the Round 1 sampling, including: Trichloroethene (maximum 11,000 ppb); total 1,2 Dichloroethene (max 9,000 ppb); 1,1,1 Trichloroethane (max 170 ppb); 1,1 Dichloroethane (max 6,300 ppb); 1,1 Dichloroethene (max 270 ppb); Tetrachloroethene (maximum 66 ppb); Vinyl Chloride (max 110 ppb); and Methylene Chloride (max 6,000 ppb). Similar VOCs were detected in the Round 2 sampling, but with fewer exceedances of SCGs and at generally lower numbers. During Round 2 the VOCs found at or above SCGs were: Trichloroethene (max 15 ppb); 1,1,1 Trichloroethane (max 110 ppb); Vinyl Chloride (max 24 ppb); and Methylene Chloride (max 7 ppb). The generally lower VOC levels seen in the top of rock wells during Round 2 were likely the result of seasonal variations in groundwater infiltration, rather than from a sudden occurrence of natural attenuation mechanisms.

SVOCs were analyzed in Round 1. The only exceedance of groundwater SCGs for SVOCs in the top of rock wells was Phenol, found at 13 ppb in well OW-7R. Only rock well OW-7R was reanalyzed for SVOCs in Round 2. Phenol at 10 ppb was again the only SVOC detected above its respective SCG.

Inorganics were analyzed in both the Round 1 and Round 2 sampling events. The Round 1 analytical data showed Aluminum and Manganese above SCGs, with maximum concentrations of 1,400 ppb and 1,670 ppm respectively. The Round 2 sampling detected no metals compounds at or above SCGs.

There were no Pesticides or PCBs detected in the two sampling rounds. Contaminants findings for bedrock groundwater are summarized in Table 8.

SOH Interior Bedrock Wells

Two (2) preexisting bedrock wells located within the SOH (Metalade) building were sampled and analyzed during the RI. These interior wells, designated IW-1R and IW-2R, are reportedly no longer used, but in the past were used for supply and recirculation of cooling water for plant operations. When sampled, these wells still contained intact down hole pump equipment and discharge/return lines.

During Round 1 sampling of the interior bedrock wells several VOCs were found at or above SCGs, including: Vinyl Chloride (max 110 ppb); Trichloroethene (max 64 ppb); total 1,2 Dichloroethene (max 6,700 ppb); and 1,1 Dichloroethane (max 21 ppb). Round 2 sampling of these wells found similar VOCs above SCGs: Vinyl Chloride (max 69 ppb); Trichloroethene (max 150 ppb); total 1,2 Dichloroethene (max 670 ppb); 1,1 Dichloroethane, (maximum 96 ppb) and 1,1,1 Trichloroethane, (maximum 110 ppb). There was no obvious trend in VOC levels in the interior bedrock wells from Round 1 to Round 2.

No SVOCs at or above SCGs were detected during the Round 1 interior bedrock sampling. SVOCs were not reanalyzed in Round 2.

Inorganics were analyzed in both the Round 1 and Round 2 interior bedrock well sampling events. The Round 1 sampling event found the following metals at or above SCGs: Aluminum (max 753 ppb); Cadmium (max 190 ppb); Chromium (max 3,700 ppb); Nickel (max 7,770 ppb); Lead (max 78 ppb) and Zinc (max 2,790 ppb). The Round 2 results showed similar exceedances by metals: Cadmium (max 797 ppb); Chromium (max 4,380 ppb); Lead (max 75 ppb); Nickel (max 4,660 ppb) and Zinc (max 4,280 ppb) above their respective SCGs.

There were no pesticides or PCBs detected in either sampling event. Contaminants findings for bedrock groundwater are summarized in Table 8.

Surface Water (Swale Area)

Three (3) surface water samples, SW-1, SW-2, and SW-3 were collected from the adjacent drainage swale during the RI. Sample SW-1 was collected from the swale west of where it bends. Samples SW-2 and SW-3 were collected from the swale closer to the SOH facility, near surface sediment samples SED-2 and SED-3 respectively. No VOCs were detected at or above SCGs in the surface water samples. No SVOCs, with exception of one occurrence of Pentachlorophenol at 4 ppb, were detected at or above SCGs.

Inorganics found at or above SCGs included: Aluminum (maximum 997 ppb); and Manganese (max 909 ppb). There were no pesticides or PCBs detected in these samples. Contaminant findings for these surface water samples are summarized in Table 9.

4.2 Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of potential exposures and health risks can be found in Section 6.00 of the RI Report.

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

A qualitative risk assessment was completed in the RI to identify potential risks to human health due to contaminants present at the site. This assessment evaluated the toxicological properties of the contaminants detected at the site and potential exposure pathways. The concentrations of contaminants at potential points of exposure were then compared to SCGs such as Drinking Water Standards, Surface Water Standards, Soil Guidance Values, USEPA Preliminary Remediation Goals and Risk Based Concentration Goals, and NYSDEC Aquatic Sediment Guidance Values.

Conclusions drawn from the risk assessment indicated that, although SCGs were exceeded for some VOCs, SVOCs and metals, there are no immediate health threats posed by the site under current exposure conditions. This is based in large part because groundwater near the site is not currently used as a water supply by residents or businesses and because the site is used primarily for industrial purposes. However, two areas were identified during the RI where there is the potential for unacceptable exposure.

One potential exposure area identified was within the drainage swale at the SED-3 sampling location, (southwest of the Ruby-Gordon Building), where the drainage swale bends to the west. This area is accessible to children playing or exploring the swale. As such, a residential exposure scenario was considered appropriate for evaluating remedial options for this area. Surface soil SCGs appropriate for residential exposures were exceeded in this area.

The second potential exposure area identified was the overburden groundwater in the source area and the plume that extends from this area towards the south and northwest. This source area and plume poses a future long term threat of exposure to site contaminants. Utility workers working on subsurface utilities along Commerce Drive in the immediate site area, and construction workers involved in excavation or other intrusive activities in the plume area would likely be exposed to contaminants at levels of concern. Other unacceptable exposures could also occur if the site usage changes in the future.

The New York State Department of Health (NYSDOH) conducted two off site groundwater sampling events from sumps, one located at 56 Commerce Drive and the other at 80 Commerce Drive, to determine if contaminated groundwater from the SOH site is impacting off site receptors. Sampling was also conducted in an off site wetland located approximately 1,500 feet north of the site. The analytical results from the sampling concluded that there are no apparent impacts at this time from the SOH site to buildings or human receptors across Commerce Drive from the site or to the wetland area.

4.3 Summary of Environmental Exposure Pathways:

This section summarizes the environmental exposures which may be presented by the site. The Fish and Wildlife Impact Assessment included in the RI presents a more detailed discussion of the potential impacts from the site to fish and wildlife resources.

Under current conditions, surface water runoff from the site and erosion of surficial soils to the drainage swale on the western edge of the SOH facility may be contributing trace contaminants to the surface water and soils in the drainage swale. In the past, uncontrolled releases and subsequent runoff would likely have produced significantly higher loadings to the swale area.

Although SCGs appropriate for residential exposures were exceeded by total PAHs in surface soil location SED 3, they were not at levels where observable or significant impacts to fish or wildlife would likely occur. Since this is shallow swale that has very low flow and no significant fish propagation or population identified, very minimal impacts to fish or wildlife resources would be expected from the site contaminants found in the surface water and swale soils.

SECTION 5: ENFORCEMENT STATUS

In 1992, the Department began efforts to negotiate with Potentially Responsible Parties (PRPs) to have them conduct a Remedial Investigation and Feasibility Study (RI/FS) for the site. PRPs are those who may be legally liable for contamination occurring at a site. PRPs may include past and present owners and operators, waste generators, transporters, and those who arrange for the disposal of wastes. PRPs identified for this site include the following: SOH as owner and operator at the time of releases; Maury A. Ryan, Dr. James H. Ryan, Jr., and Stanley Klimek, as owners at the time of releases and as current owners of part of the property; SOH Acquiring, Inc., as current owner of the manufacturing facility; and Metalade, Inc., as current operator and as an operator at the time of releases. Negotiations with the PRPs were unsuccessful, and the site was subsequently referred to the State Superfund for implementation of the RI/FS program.

Once final remedy selection is completed for this site, the NYSDEC will again approach site PRPs. The NYSDEC will seek to obtain an agreement for PRP implementation of the remainder of the remedial program, including design, construction, and long term operation and maintenance of the remedy.

Also in 1992, Ruby Gordon, Inc. filed a private Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) suit against SOH, Metalade, and related parties in the United States District Court, Western District of New York, to recover costs and damages associated with the treatment and discharge of contaminated groundwater emanating from the SOH site. In 1994, the Department was ordered by the court to join that CERCLA suit as a necessary party for resolution of issues raised by the suit. The court retains jurisdiction over the parties and resolution of the CERCLA suit for this site.

In addition to the remedial program being implemented to address contamination at the site, the Department has pursued RCRA enforcement procedures against SOH and Metalade for violations of hazardous waste management regulations during their respective operations at the site. These actions have been independent of this remedial program, except where leaking drums of wastes have established releases.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process set forth in regulations (6 NYCRR Part 375-1.10). The overall remedial goal is to meet Standards, Criteria, and Guidance (SCGs) and be protective of 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:

- *Eliminate the potential for direct human or animal contact with site contaminants.*
- *Reduce, control, or eliminate to the extent practicable the contamination present within the soils and waste on site.*
- *Reduce, control, or eliminate to the extent practicable any further migration of contaminated groundwater from the site, including migration into the Ruby Gordon basement sumps.*
- *Provide, to the extent practicable, for attainment of groundwater SCGs in the area affected by the site.*

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy should be protective of human health and the environment, be cost effective, comply with other statutory laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. A large number of potential remedial technologies and alternatives for the site were identified, screened and evaluated in the Final FS Report entitled *"Feasibility Study Report, Stuart-Olver-Holtz Site, Henrietta, New York, October 1996"*.

The alternatives presented in this PRAP reference Site Wide Alternative (SWA) designations used in the FS Report. However, for simpler presentation, the PRAP discusses a smaller number of alternatives that represent the range of alternatives evaluated in the FS. Not all Site Wide Alternatives presented in the FS Report are repeated in this PRAP. Specifically, SWA-4 is not presented because little difference separates SWA-3 and SWA-4, with the substantive difference being in the disposal for surface soils and sediments.

A summary of the detailed analysis of alternatives follows. As used in the following text, the Time to Implement reflects only the time that would be required to implement the remedy, it does not include time required to task a design contractor, design the remedy and procure contracts for construction under a State funded program, nor to negotiate consent orders and design details with the responsible parties for PRP implementation of the remedy.

7.1: Description of Alternatives

The potential remedies are intended to address the contaminated soils, sediments, surface water and groundwater at the site. Because of the presence of an overburden source area near and possibly beneath the Metalade building, and the presence of a significant contaminant plume migrating from the site in the overburden groundwater, all of the alternatives except No Action also include source area and groundwater plume controls.

Site Wide Alternative #1 (SWA-1): No Action

Total Present Worth:	$201,500
Capital Cost:	$ 10,000
Annual O&M: (Present worth)	$191,500
Time to Implement:	immediately

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. It would allow the site to remain in an unremediated state, but would require continued operation of the existing pretreatment system for the Ruby Gordon basement sump water. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Site Wide Alternative #2 (SWA-2): Deep Collection Trench; Source Area Extraction Wells; Active Groundwater Pretreatment and Discharge to POTW; Excavation and Off Site Disposal of Soil and Sediment

Total Present Worth:	$2,986,700
Capital Cost:	$1,410,000
Annual O&M:(Present worth)	$1,576,700
Time to Implement:	12-18 months

SWA-2 is shown conceptually on Figure 3 and would include the following remedial actions:

Overburden Groundwater Actions for SWA-2

- Install and operate a groundwater collection trench approximately 23 feet deep along the north and west SOH property boundaries (across the overburden plume) to collect and contain contaminated groundwater. Groundwater from the collection system would be pumped for pretreatment on the SOH site. The system would be operated for long term control of contaminated groundwater.

- Install and operate a groundwater pretreatment system on the SOH site. The pretreatment system would consist of an air stripper (or performance equivalent) and any water conditioning needed to facilitate reliable stripping. Pretreated water would be discharged via gravity line to the existing sanitary sewer and POTW. Air treatment may be necessary for control of air emissions from the air stripper.

- Install and operate groundwater extraction wells for removal of contaminants from the source area near OW-7S. Operation would occur until the source area is removed or until contaminant removal becomes inefficient as evidenced by steady state contaminant levels. Source area groundwater would be treated as described for the collection trench system. Alternately, a Soil Vapor Extraction system or Dual Phase Vacuum Extraction System could be used if design evaluations show this technology to be more efficient. An additional investigation to locate a soil contaminant source area would be done during design to support the evaluation for possible vapor extraction.

- Pump contaminated water collected from the Ruby Gordon basement sumps to the groundwater pretreatment system on the SOH site. Take the existing Ruby Gordon pretreatment system off-line. Divert surface water currently entering the basement drainage system from the Ruby Gordon loading dock to reduce the volume of water requiring pretreatment.

- Conduct periodic, long term overburden groundwater monitoring to evaluate the extent to which the remedial action objectives are being met.

- Construct drainage improvements in the area between the Ruby Gordon basement and the SOH site to minimize groundwater recharge to the basement sumps. Improvements would include a lined (low permeability) swale or equivalent.

- Deed restrictions would be recommended to prevent future uses of the site which are incompatible with the Site Wide Alternative.

Bedrock Groundwater Action for SWA-2

- Implement institutional controls to reduce the potential for exposure to contaminated bedrock groundwater. The proposed controls would include: disconnecting the SOH interior bedrock wells; conducting periodic groundwater use surveys in the site area; and conducting bedrock groundwater monitoring to track groundwater movement and contaminant levels. The monitoring program would be narrow in scope, but would require action be taken if conditions change and produce significant potential exposures or off site loadings. SWA-2 would also include a recommendation that deed restrictions be implemented to preclude future use of groundwater at the SOH site.

Soil Surface Actions for SWA-2

- Excavate the on-site and off site surface soils that are above SCGs and haul off site for disposal at a permitted waste disposal facility. Regrade the excavated areas, place topsoil and restore vegetation. Within SOH property boundaries, isolation of contaminated surface soils using a clean soil or asphalt cover could be done instead of excavation provided proper drainage and grading is maintained. It is estimated that as much as 875 CY of surface soil would require excavation or isolation. Prior to surface soil removal or isolation, a focussed soil sampling effort would be implemented to refine the limits of surface soils exceeding SCGs.

SOH Sump/Catch Basin Actions for SWA-2

- Evaluate all waste lines and other piping leading from the SOH building to identify any additional connections to sumps, catch basins or other uncontrolled discharge locations.

- Clean all accumulated sediments and debris from site sumps, catch basins and related piping. Transport off site for disposal in a permitted hazardous waste disposal facility.

- After cleaning, upgrade or decommission lines as appropriate to prevent further potential releases from spills or migration of contaminants from the source area.

Site Wide Alternative #3 (SWA-3): Downgradient and Source Area Extraction Wells: Groundwater Pretreatment and Discharge to POTW: Excavation and Off Site Disposal of Soil and Sediments.

Present Worth:	$2,778,300
Capital Cost:	$1,114,500
Annual O&M:(Present worth)	$1,663,800
Time to Implement:	12-18 months

SWA-3, shown in Figure 4, would include the same remedial activities described in SWA-2 except that extraction wells would be used to intercept the overburden plume in lieu of the deep collection trench along the north and west SOH property boundaries. The extraction wells would be designed and operated to provide hydraulic containment of the overburden plume and to collect contaminated groundwater for treatment. The extraction wells would be installed approximately 50 feet apart to a depth of approximately 23 feet. Treatment of collected groundwater would occur as described for SWA-2.

Areas of contaminated surface soils, on-site sumps, catch basins and piping, and contaminated bedrock groundwater would all be addressed as outlined for SWA-2.

<u>Site Wide Alternative #5 (SWA-5): Shallow Collection Trench System; Source Area Extraction Wells; Pretreatment by Zero Valence Iron and Discharge to POTW; Excavation or Isolation of Soils and Sediments with Off Site Disposal</u>

Total Present Worth:	$2,778,100
Capital Cost	$1,917,000
Annual O&M (Present Worth)	$861,100
Time to Implement:	12-18 months

SWA-5, shown in Figure 5, is similar to SWA-2 with the major difference being a shallower collection trench augmented by high permeable relief columns (or an equivalent) and with passive pretreatment by zero valence iron. SWA-5 includes the following remedial actions:

Overburden Groundwater Actions for SWA-5

- Install and operate a shallow groundwater collection trench system along the north and west property boundaries (across the overburden plume) to collect and contain contaminated groundwater. The trench system would consist of a shallow (approximately 15 feet deep) collection trench with high permeability relief columns (or functional equivalent) beneath the trench designed to intercept deeper contaminated sand lenses. Collected groundwater would flow by gravity to a passive on-site groundwater pretreatment vault. The system would be operated for long term control of contaminated groundwater.

- If necessary to achieve or enhance hydraulic containment by the collection trench system, a sheet piling barrier wall would be constructed just downgradient from the collection system. (The cost of sheet piling is included in the capital cost estimate, if not needed then approximately $240,000 of cost savings would incur)

- Install and operate a passive groundwater pretreatment system on the SOH site. The pretreatment system would consist of subsurface vaults containing zero valence iron filings for destruction of chlorinated VOC's. Groundwater pretreated by contact with the iron would discharge by gravity to the sanitary sewer for final treatment at the local POTW.

- Install and operate groundwater extraction wells for removal of contaminants from the source area near OW-7S. Operation would occur until the source area is removed or until contaminant removal becomes inefficient as evidenced by steady state contaminant levels. Source area groundwater would be pumped for pretreatment as described for the collection trench system. Similar to SWA-2 additional source area investigation would be done during design and installation of a Soil Vapor or Dual Phase Vapor Extraction System may be implemented if found cost effective for remediation at the source area.

- Install and operate a shallow groundwater collection trench along the portion of the south SOH property boundary adjacent to the Ruby Gordon basement. This trench would be installed deeper than the basement to intercept contaminated groundwater before it enters basement sumps. Collected groundwater would flow by gravity to the pretreatment vault. Operate for long term control of groundwater between the SOH site and the Ruby Gordon basement. Operation of the existing Ruby Gordon pretreatment system would continue until the groundwater collection trench becomes effective and a evaluation is made to disconnect the existing system.

- Conduct periodic, long term overburden groundwater monitoring to evaluate the extent to which the remedial action objectives are being met.

- Construct drainage improvements in the area between the Ruby Gordon basement and the SOH site to minimize groundwater recharge to the Ruby Gordon basement and the overburden collection system.

- Deed restrictions would be recommended to prevent future uses of the site which are incompatible with the Site Wide Alternative.

Bedrock Groundwater Actions for SWA-5

- SWA-5 would include all the same institutional controls to address bedrock groundwater contamination that are described for SWA-2.

Soil Surface Actions for SWA-5

- SWA-5 would include all the same actions set forth for surface soils that are described for SWA-2.

SOH Sump/Catch Basin Actions for SWA-5

- SWA-5 would include all the same actions for site sumps, catch basins and related piping that are described for SWA-2.

7.2 Evaluation of Remedial Alternatives

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

The first two criteria are considered as "threshold criteria" which must be satisfied in order for an alternative to be eligible for the selection process.

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, or guidance.

Site Wide Alternative #1 (SWA-1), (No Action) would not be in compliance with SCGs, since no action is taken to address site contaminants found exceeding soil, water, and sediment criteria.

SWA-2 (Deep Trench), SWA-3 (Extraction Wells) and SWA-5 (Shallow Trench System) would be comparable in their ability to meet the groundwater SCGs in the long term. Groundwater SCGs would not be met quickly, but over a longer period each would be expected to reduce contaminants to levels approaching SCGs. Each of these alternatives would be expected to readily achieve SCGs for treatment and discharge of contaminated water through use of on-site pretreatment and discharge for final off site treatment at the local POTW.

SWA-2, SWA-3 and SWA-5 have the same remedial elements for soil and sediments and would be comparable in achieving soil SCGs. Each alternative would require that areas of contaminated surface soils that exceed SCGs be removed from the site or isolated.

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.

SWA-1 (No Action), would not be protective of human health and the environment. No action would be taken to address contaminated groundwater, soils or sediments and the site would continue to pose a potential unacceptable risk of human exposure.

SWA-2 (Deep Trench), SWA-3 (Extraction Wells) and SWA-5 (Shallow Trench System) would each provide adequate overall protection of human health and the environment. These alternatives would equally limit the potential for unacceptable human exposure to site contaminants through the combined effect of surface soil remediation, control of contaminated groundwater and implementation of institutional controls. SWA-5 would provide an additional benefit by intercepting contaminated groundwater prior to entering the Ruby Gordon basement sumps and minimizing potential exposures through that route.

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

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

SWA-1 (No Action) would not be expected to produce any short-term impacts since there would be no construction activities and the site would be left in its present condition. Remedial objectives would not be expected to be achieved by SWA-1 within any reasonable time frame.

The most likely short term community impacts that could result from construction of SWA-2, SWA-3 or SWA-5 would be a temporary increase in truck traffic and construction noise, and an increased potential for nuisance dust emissions. Potential short term impacts to workers would be from the risks common to heavy construction activities and the risk of short term exposures to potential high levels of site contaminants.

SWA-3 (Extraction Wells) would produce less short term impacts to the community and to workers than SWA-2 and SWA-5 because the use of drilled wells instead of trench excavation would result in the least amount of site disturbance.

SWA-2 (Deep Trench) and SWA-5 (Shallow Trench System) would produce a higher risk of short term impacts to the community and to workers than SWA-3 due to the relatively large amount of excavation required and the greater quantities of potentially contaminated soils and construction water that would have to be handled. Because of differences between trench systems, SWA-5 would probably require less excavation and less soil and water handling than SWA-2 and somewhat lower short term impacts would be expected.

The time required to achieve remedial action objectives would be comparable for SWA-2, SWA-3 and SWA-5. Objectives applicable to the soil and sediment media would be met quickly. The objective for control of further migration of contaminated groundwater would also be met relatively quickly (months). The objective for attainment of groundwater SCGs in the overburden plume would be expected to take much longer (years), with SWA-2, SWA-3 and SWA-5 being considered equivalent. SWA-5 has the benefit of a south side collection trench that would be expected to help attain SCGs in water collected from the Ruby Gordon sumps more quickly than either SWA-2 or SWA-3.

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

SWA-1 (No Action) would not provide any effective long term or permanent improvements to site conditions since no action would occur at the site.

SWA-2 (Deep Trench) and SWA-3 (Extraction Wells) would be comparable overall in terms of the long term effectiveness and reliability of the remedial actions. SWA-5 (Shallow Trench System) would have an advantage from simpler long term operation and better operational reliability. SWA-5 would be a passive system and would continue to operate even if left untended for long periods. Both SWA-2 and SWA-3 would have a higher likelihood for periodic breakdown that if left untended, would result in lower long term effectiveness than SWA-5.

For surface soil and sediment media, SWA-2, SWA-3 and SWA-5 would be equally effective in the long term because excavation and off site disposal of soils and sediments would be permanent and irreversible.

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.

SWA-1 (No Action) would not reduce the toxicity, mobility or volume of contaminants at the site.

SWA-2 (Deep Trench), SWA-3 (Extraction Wells) and SWA-5 (Shallow Trench System) would be generally comparable in reducing the mobility and volume of contaminants in the overburden groundwater. The collection systems proposed in these alternatives would hydraulically limit further off site migration and over time would extract significant volumes of contaminated overburden groundwater from the area of concern. SWA-5 has the added advantage of a collection system that would directly intercept groundwater migrating from the site towards Ruby Gordon, before it gets to the basement sumps.

SWA-2, SWA-3 and SWA-5 would all be effective in reducing the toxicity of contaminants present in the collected groundwater since it would be subjected to on-site pretreatment and off site disposal to the local POTW. SWA-5 would have a significant advantage over SWA-2 and SWA-3 since the zero valence iron pretreatment would destroy the chlorinated VOCs without air emissions. SWA-2 and SWA-3 would move contaminants from groundwater to another media, either into the atmosphere by direct stripping, or into a carbon stripper if that treatment is used for the air stream.

Reduction in contaminants from surface soils and sediments would be comparable for SWA-2, SWA-3 and SWA-5 since the soils and sediments would be permanently removed and disposed off site at a permitted facility.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction, the reliability of the technology, and the ability to monitor the effectiveness of the remedy. Administratively, the availability of the necessary personnel and equipment are evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, and availability of adequate disposal capacity at permitted disposal facilities.

SWA-1 (No Action) is easily implementable in that it involves no action other than the continued operation of the existing groundwater pretreatment system in the Ruby Gordon basement.

SWA-2 (Deep Trench), SWA-3 (Extraction Wells) and SWA-5 (Shallow Trench System) are generally comparable with regard to the administrative and monitoring considerations of this criterion. However, there are some significant differences in constructability and the amount of operation and maintenance required. SWA-3 would be the easiest to construct because the amount of excavation and soil handling is reduced by the reliance on drilled wells instead of conventional excavated collection trenches. Both SWA-2 and SWA-5 would involve more intrusive construction than SWA-3 and could encounter implementation difficulties from the quantities of excavated soil that would need to be handled and staged on-site while trench construction occurs. SWA-2 would in turn be more difficult to construct than SWA-5, because more excavated dirt would be expected from the deeper trench, and because of construction difficulties (equipment needs, shoring, dewatering) associated with placement of an open trench to a depth of 25 feet.

Contractors, equipment and material should be readily available for SWA-2, SWA-3 and SWA-5. However, the deeper trench of SWA-2 may require more specialized equipment for excavation and trench shoring. SWA-5 would require the acquisition of special iron media, however, other sites including one in upstate New York have used this material with success and without undue difficulties.

With regard to operation and maintenance, SWA-5 has a significant advantage over both SWA-2 and SWA-3 as both the collection and pretreatment systems would be passive in nature and require the least amount of labor and expense. However, SWA-5 is a relatively new technology with some question about how long the iron media would last before replacement is needed. SWA-2 and SWA-3 would include active groundwater pumping and pretreatment systems that would require regular, long term operational attention and maintenance. SWA-2 would be expected to have higher operation and maintenance costs than SWA-3 due to the reliance on pumping wells and their propensity for well clogging and pump failure over the long term. Because of the higher chance of well and pump failure, the long term reliability of SWA-2 would be considered somewhat less than SWA-3, and significantly less than SWA-5.

7. Cost. Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Operation and maintenance costs are usually based on 30 years. 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 10.

SWA-1 (No Action) would be the lowest cost Site Wide Alternative, as no site remediation would occur except for the continued operation and maintenance of the Ruby-Gordon basement pretreatment system.

SWA-2 (Deep Trench) includes major construction activities such as excavation and collection trench installation along with high operation and maintenance costs. Likewise, SWA-5 has major construction activities and components associated with it, but has lower overall operational and maintenance costs. The capital costs of the barrier wall have been included in SWA-5 and if not implemented, the cost of SWA-5 would be reduced by approximately $240,000. However, either with or without the barrier wall the operation and maintenance costs of SWA-5 are not as great when compared to SWA-2 and SWA-3. Furthermore, although SWA-3 involves less physical construction than SWA-2 and SWA-5, the long-term operation and maintenance costs clearly outweigh any cost savings in capital construction costs.

Additionally, the alternatives that involve off site soil disposal, (SWA-2, SWA-3 and SWA-5) may have significant cost variations due to unanticipated events such as larger soil volumes or changes in off-site disposal pricing. The cost estimates for soil remediation may be modified based on pre-design sampling to further refine the area of soils requiring remediation.

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

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan will be evaluated and considered before a final selection of remedy is made. A " Responsiveness Summary" will be prepared to describe public comments received and provide responses on how the Department will address the concerns raised. If the final remedy selected differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PREFERRED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC is proposing Site Wide Alternative #5 (SWA-5) as the remedy for this site.

This recommendation is based on the following factors:

Site Wide Alternative #1(No Action) would not adequately comply with the SCGs for any of the contaminated site media and would not be protective of human health and the environment. SWA-1 is rejected on that basis.

Site Wide Alternative #2 (Deep Trench) would be protective of human health and the environment and would adequately comply with SCGs, but it would not achieve the remedial objectives as fully as SWA-5. SWA-2 would be more costly than both SWA-3 and SWA-5, even if the SWA-5 barrier wall were to be constructed. SWA-2 would also likely produce more temporary impacts during construction than either SWA-3 or SWA-5. SWA-2, while likely more reliable than SWA-3 over the long term, would not be as reliable as SWA-5. Because of these considerations, SWA-2 is not recommended over SWA-5.

Site Wide Alternative #3 (Extraction Wells) would be protective of human health and the environment and would adequately comply with SCGs, but it would not achieve the remedial objectives as fully as SWA-5. SWA-3 would be comparable to SWA-5 in cost if the SWA-5 barrier wall were constructed. If the barrier were not constructed, then SWA-3 would be more costly than SWA-5. SWA-3 would produce less temporary impacts during construction than would either SWA-2 or SWA-5. SWA-3 would require significantly more long term operation and maintenance effort and cost than SWA-5, yet have less long term reliability. Because of these considerations SWA-3 is not recommended over SWA-5.

SWA-5 would offer the added benefit of on-site contaminant destruction without air emissions. Air emissions would be a concern under SWA-2 and SWA-3 since both would rely on moving contaminants from the water media to air. Contaminant destruction under SWA-2 or SWA-3 would occur only as part of any air treatment that may be required for control of emissions.

The estimated total present worth cost to implement the remedy is **$2,778,100**. The capital cost to construct the remedy is estimated to be **$1,917,000** and the estimated average annual operation and maintenance present worth cost for 30 years is **$861,100**.

The elements of the proposed remedy are as follows:

OVERBURDEN GROUNDWATER

- Install and operate a shallow groundwater collection trench system along the north and west property boundaries (across the overburden plume) to collect and contain contaminated groundwater. The trench system would consist of a shallow (approximately 15 feet deep) collection trench with high permeability relief columns (or functional equivalent) beneath the trench designed to intercept deeper contaminated sand lenses. Collected groundwater would flow by gravity to a passive on-site groundwater pretreatment vault. The system would be operated for long term control of contaminated groundwater.

- If necessary to achieve or enhance hydraulic containment by the collection trench system, a sheet piling barrier wall would be constructed just downgradient from the collection system. (The cost of sheet piling is included in the capital cost estimate for SWA-5. If not needed then approximately $240,000 of cost savings would incur)

- Install and operate a passive groundwater pretreatment system on the SOH site. The pretreatment system would consist of subsurface vaults containing zero valence iron filings for destruction of chlorinated VOC's. Groundwater pretreated by contact with the iron would discharge by gravity to the sanitary sewer for final treatment at the local POTW.

- Install and operate groundwater extraction wells for removal of contaminants from the source area near OW-7S. Operation would occur until the source area is removed or contaminant removal becomes inefficient as evidenced by steady state contaminant levels. Source area groundwater would be pumped for pretreatment as described for the collection trench system. A Soil Vapor or Dual Phase Vapor Extraction System may be implemented to address the source area if found cost effective for remediation at the source area. An additional investigation to locate a soil contaminant source area would be done during design to support the evaluation for possible vapor extraction.

- Install and operate a shallow groundwater collection trench along the portion of the south SOH property boundary adjacent to the Ruby Gordon basement. This trench would be installed deeper than the basement to intercept contaminated groundwater before it enters basement sumps. Collected groundwater would flow by gravity to the pretreatment vault. Operate for long term control of groundwater between the SOH site and the Ruby Gordon basement. Operation of the existing Ruby Gordon pretreatment system would continue until the groundwater collection trench becomes effective and an evaluation is made to disconnect the existing system.

- Conduct periodic, long term overburden groundwater monitoring to evaluate the extent to which the remedial action objectives are being met.

- Construct drainage improvements in the area between the Ruby Gordon basement and the SOH site to minimize groundwater recharge to the Ruby Gordon basement and the overburden collection system.

- Deed restrictions would be recommended to prevent future uses of the site which are incompatible with the proposed remedy.

BEDROCK GROUNDWATER

- Implement institutional controls to reduce the potential for exposure to contaminated bedrock groundwater. The proposed controls would include: disconnecting the SOH interior bedrock wells; conducting periodic groundwater use surveys in the site area; and conducting bedrock groundwater monitoring to track groundwater movement and contaminant levels. The monitoring program would be narrow in scope, but would require action be taken if conditions change and produce significant potential exposures or off site loadings. SWA-5 would also include a recommendation that deed restrictions be implemented to preclude future use of groundwater at the SOH site.

SURFACE SOILS

- Excavate the on-site and off site surface soils that are above SCGs and haul off site for disposal at a permitted waste disposal facility. Regrade the excavated areas, place topsoil and restore vegetation. Within SOH property boundaries, isolation of contaminated surface soils using a clean soil or asphalt cover could be done instead of excavation, provided proper drainage and grading can be maintained. It is estimated that about 875 CY of surface soil would require excavation or isolation. Prior to surface soil removal or isolation, a focused soil sampling effort would be implemented to refine the limits of surface soils exceeding SCGs.

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- Evaluate all waste lines and other piping leading from the SOH building to identify any additional connections to sumps, catch basins or other uncontrolled discharge locations.

- Clean all accumulated sediments and debris from site sumps, catch basins and related piping. Transport off site for disposal in a permitted hazardous waste disposal facility.

- After cleaning, upgrade or decommission lines as appropriate to prevent further potential releases from spills or migration of contaminants from the source area.

Table 1
SUMMARY OF CONTAMINANTS OF CONCERN IN SUBSURFACE SOILS

Contaminant of Concern	Concentration Range $\mu g/l$ (ppb)	SCGs $\mu g/l$ (ppb)	Frequency of Exceeding SCGs
Volatiles:	----	No Exceedances above SCGs, (1), (2)	----
Semi-Volatiles:	----	No Exceedances above SCGs, (1), (2)	----
Metals:	Concentration Range *mg/kg* (ppm)	No Exceedances above SCGs	

Footnote: (1) NYSDEC TAGM 4046 SCG.
(2) SCG based upon USEPA Region IX Preliminary Remediation Goals (PRGs) 1993

Table 2
SUMMARY OF CONTAMINANTS OF CONCERN IN SURFACE SOILS

Contaminant of Concern	Concentration Range *µg/kg* (ppb)	SCGs *µg/kg* (ppb)	Frequency of Exceeding SCGs
Volatiles:	- - - -	No Exceedances [1],[2] above SCGs	- - - -
Semi-Volatiles:			
Total PAHs	815 - 741,500	100,000 [a]	2/8
Metals:	Concentration Range *mg/kg* (ppm)	SCGs *mg/kg* (ppm)	
Cobalt	3.2 - 36.6	30 [1]	1/8
Lead	15.8 - 529	500 [1]	1/8

Footnote: [1] NYSDEC TAGM 4046 SCG.
[2] SCG based upon USEPA Region IX PRGs 1993.
[a] Total PAHs 100,000 ppb, SCG based upon a determination by NYSDOH and NYSDEC of potential health impacts from surface soil exposure pathway.

Table 3
SUMMARY OF CONTAMINANTS OF CONCERN IN SOH SUMP/CATCH BASIN SEDIMENTS

Contamiuant of Concern	Concentration Range $\mu g/l$ (ppb)	SCGs $\mu g/l$ (ppb)		Frequency of Exceeding SCGs
Volatiles:				
1,1 Dichloroethane	ND-32,000	200[1]	---	1/2
1,2 Dichloroethene (total)	ND-17,000	300[1]	1,400 [2]	1/2
1,1,1 Trichloroethane	8,300-2,000,000	800[1]	49,000 [2]	1/2
Carbon Tetrachloride	ND-140,000	600[1]	1,600 [2]	1/2
Chlorobenzene	ND-8,600	1,700[1]	---	1/2
Trichloroethene	ND-8,900	700[1]	---	1/2
Tetrachloroethene	350-91,000	1,400[1]	650 [2]	1/2
Toluene	580-110,000	1,500[1]	---	1/2
Ethylbenzene	ND-9,200	5,500[1]	---	1/2
Xylene (total)	490-46,000	1,200[1]	---	1/2
Semi-Volatiles:				
Total SVOCs (as PAHs)	43,680 - 131,690	500,000 ppb [1]		0/2
Metals:	***mg/kg* (ppm)**	***mg/kg* (ppm)**		
Cadmium	4.2-63.3	10.0 [3]		1/2
Chromium	165-714	50.0[3]		2/2
Copper	90.8-355	25.0 [1]		2/2
Nickel	233-983	13 [1]		2/2
Selenium	4.4-89.8	2 [1]		2/2
Zinc	256-2210	20 [1]		2/2

Footnote: [1] SCG from NYSDEC TAGM 4046
[2] SCG based upon USEPA Region IX PRGs (1993)
[3] SCG from May 1995 draft TAGM 4046 revision

Table 4
SUMMARY OF CONTAMINANT OF CONCERN IN SURFACE SOILS IN SWALE AREA

Contaminant of Concern	Concentration Range $\mu g/l$ (ppb)	SCGs $\mu g/l$ (ppb)	Frequency of Exceeding SCGs
Volatiles:	- - - -	None Exceeded SCGs [1], [2]	- - - -
Semi-Volatiles:			
Total PAHs	3,707 - 220,830	100,000 [a]	1/2
Metals	*mg/kg* (ppm)	*mg/kg* (ppm)	
Copper	17.1-68.9	25 [1]	1/2
Nickel	11.2-26.2	13 [1]	1/2
Zinc	442-844	20 [1]	2/2

Footnote: [a] Total PAHs = 100,000 ppb, SCG based upon a determination by NYSDOH/NYSDEC of potential health impacts from surface soil/sediment exposure pathway.
[1] NYSDEC TAGM 4046 SCG.
[2] SCG based upon USEPA Region IX PRCs (1993)

Table 5
SUMMARY OF CONTAMINANTS OF CONCERN IN SOH SUMP/CATCH BASIN WATER

Contaminant of Concern	Concentration Range $\mu g/l$ (ppb)	SCGs $\mu g/l$ (ppb)	Frequency of Exceeding SCGs
Volatiles:			
1,1 Dichloroethane	ND-72,000	5.0 [4]	1/2
1,1,1 Trichloroethane	ND-7,900	5.0 [4]	1/2
Toluene	ND-5,800	5.0 [4]	1/2
Ethylbenzene	ND-2,700	5.0 [4]	1/2
Xylene (total)	ND-15,000	5.0 [4]	1/2
Semi-Volatiles:			
Phenol	ND-360	1.0 [4]	1/2
Metals:			
Aluminum	2,940-15,700	100 [4]	2/2
Cadmium	34.7-4,430	10.0 [4]	2/2
Chromium	454-4,940	50 [4]	2/2
Copper	261-3,580	1,300 [5]	1/2
Lead	457-696	25 [4]	2/2
Manganese	288-7,980	500 [4]	1/2
Mercury	ND-2.4	2.0 [4]	1/2
Nickel	840-56,700	100 [5]	2/2
Silver	6.3-99.9	50 [4]	1/2
Zinc	7,610-63,500	300 [4]	2/2

Footnote: [4] NYSDEC Division of Water Ambient Water Quality Standards & Guidance TOGS 1.1.1, Oct. 1993
[5] USEPA MCLs & MCLGs

Table 6
SUMMARY OF CONTAMINANTS OF CONCERN
IN RUBY-GORDON BASEMENT SUMP WATER

Contaminant of Concern	Concentration Range $\mu g/l$ (ppb)	SCGs $\mu g/l$ (ppb)	Frequency of Exceeding SCGs
Volatiles:			
Vinyl Chloride	ND-30	2.0 (4)	3/6
Methylene Chloride	ND-120	5.0 (4)	4/6
1,1 Dichloroethene	ND-120	5.0 (4)	3/6
1,1 Dichloroethane	26-750	5.0 (4)	6/6
1,2 Dichloroethene (total)	ND-760	5.0 (4)	5/6
1,1,1 Trichloroethane	15-3,200	5.0 (4)	6/6
Trichloroethene (TCE)	4.4-550	5.0 (4)	4/6
Tetrachloroethene (PCE)	3-180	5.0 (4)	4/6
Semi-Volatiles:	- - - -	No Exceedances (4) above SCGs	- - - -
Metals:			
Aluminum	36.5-951	100 (4)	2/3
Antimony	ND-12.1	6.0 (5)	1/3

Footnote: (4) NYSDEC Division of Water Ambient Water Quality Standards & Guidance TOGS 1.1.1, Oct. 1993
(5) *USEPA MCLs & MCLGs*

Table 7
SUMMARY OF CONTAMINANTS OF CONCERN IN OVERBURDEN GROUNDWATER

Contaminant of Concern	Concentration Range $\mu g/l$ (ppb)	SCGs $\mu g/l$ (ppb)	Frequency of Exceeding SCGs
Volatiles:			
Vinyl Chloride	ND-11,000	2 (4)	9/32
Methylene Chloride	3.9-350	5 (4)	4/32
1,1 Dichloroethene	3.6-900	5 (4)	14/32
1,1 Dichloroethane	ND-10,000	5 (4)	18/32
1,2 Dichloroethene (total)	2.9-10,000	5 (4)	13/32
1,1,1 Trichloroethane	3.1-24,000	5 (4)	12/32
Trichloroethene (TCE)	1.4-140,000	5 (4)	12/32
1,1,2-Trichloroethane	12.0-53.0	35 (4)	2/32
Tetrachloroethene (PCE)	3.3-8,800	5 (4)	8/32
Metals:			
Aluminum	ND-14,900	100 (4)	15/16
Manganese	ND-1,420	500 (4)	7/16
Nickel	ND-169	100 (5)	2/32

Footnote: (4) NYSDEC Division of Water Ambient Water Quality Standards & Guidance TOGS 1.1.1, Oct. 1993
(5) USEPA MCLs & MCLGs

Table 8
SUMMARY OF CONTAMINANTS OF CONCERN
IN TOP OF BEDROCK AND INTERIOR BEDROCK GROUNDWATER

Contaminant of Concern	Concentration Range $\mu g/l$ (ppb)	SCGs $\mu g/l$ (ppb)	Frequency of Exceeding SCGs
Volatiles:			
Vinyl Chloride	ND-110	2 (4)	4/14
Methylene Chloride	ND-5,500	5 (4)	3/14
1,1 Dichloroethene	5.0-250	5 (4)	2/14
1,1 Dichloroethane	1.5-5,900	5 (4)	6/14
1,2 Dichloroethene (total)	3.8-9,000	5 (4)	7/14
1,1,1 Trichloroethane	ND-170	5 (4)	3/14
Trichloroethene (TCE)	1.5-10,000	5 (4)	6/14
Tetrachloroethene (PCE)	4.0-66	5 (4)	1/14
Semi-Volatiles:			
Phenol	ND-10	1 (4)	1/8
Metals:			
Aluminum	247-1,400	100 (4)	7/7
Cadmium	ND-797	10 (4)	4/14
Chromium	ND-4,380	50 (4)	4/14
Lead	ND-78.1	25 (4)	4/14
Manganese	ND-1,670	500 (4)	6/7
Nickel	ND-7,770	100 (5)	4/14
Vanadium	ND-22.7	20 (6)	1/7
Zinc	20.7-4,280	300 (4)	3/14

Footnote: (4) NYSDEC Division of Water Ambient Water Quality Standards & Guidance TOGS 1.1.1, Oct. 1993
(5) USEPA MCLs & MCLGs
(6) USEPA Health Advisory, Adult Lifetime

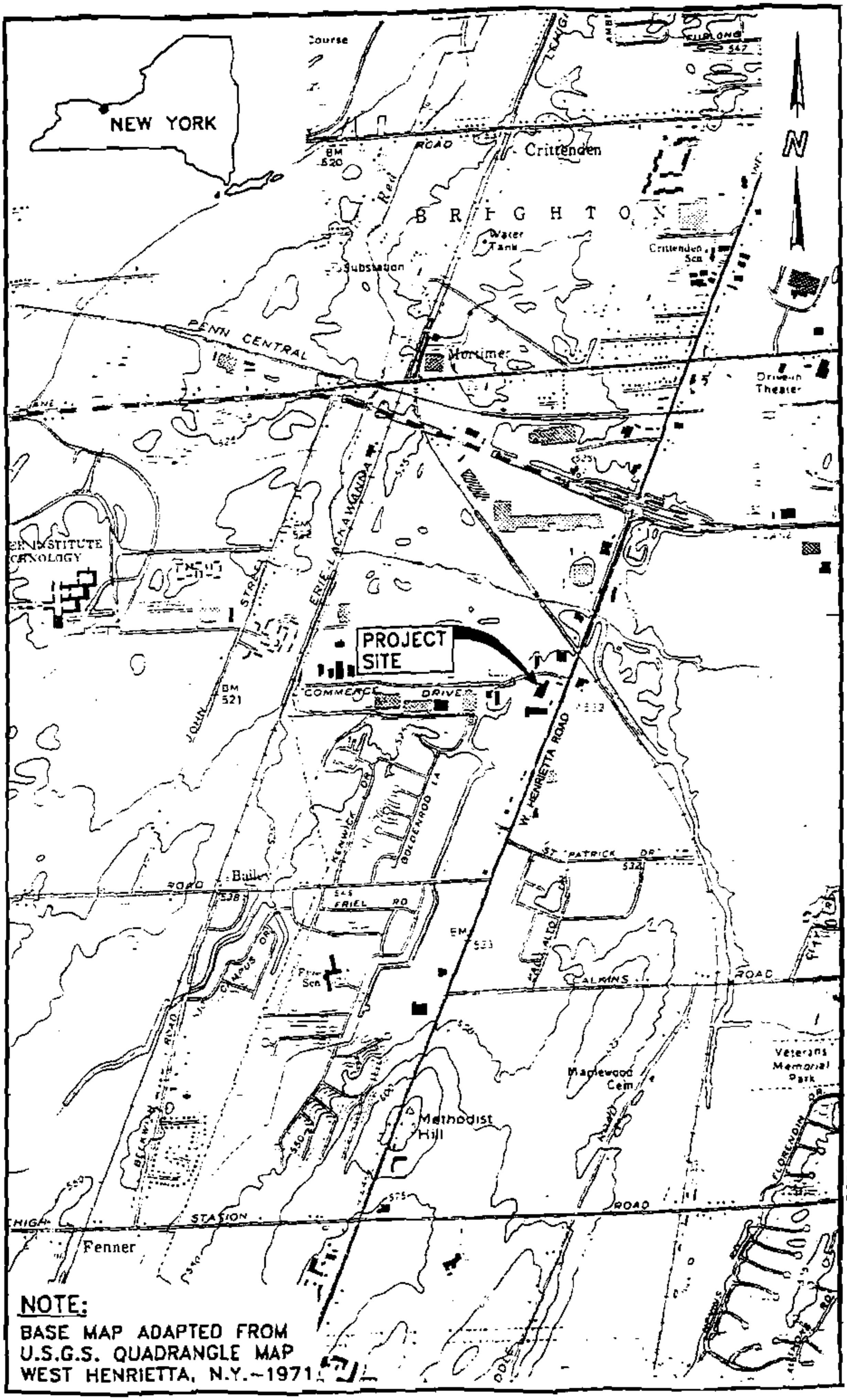
Table 9
SUMMARY OF CONTAMINANTS OF CONCERN IN SURFACE WATER (SWALE AREA)

Contaminant of Concern	Concentration Range $\mu g/l$ (ppb)	SCGs $\mu g/l$ (ppb)	Frequency of Exceeding (SCGs)
Volatiles:	----	**None Exceeded [4] SCGs**	----
Semi-Volatiles:			
Pentachlorophenol	ND-4.0	0.4 [4]	1/3
Metals:			
Aluminum	158-997	100 [4]	3/3
Lead	7.4-8.2	526 [4]	0/3
Manganese	185-909	300 [4]	2/3

Footnote: [4] NYSDEC Division of Water Ambient Water Quality Standards & Guidance TOGS 1.1.1, Oct. 1993

Table 10
SITE WIDE REMEDIAL ALTERNATIVE COSTS

Remedial Alternative	Capital Cost	Present Worth of Annual O&M	Total Present Worth
Site Wide Alternative No. 1 (No Action)	$10,000	$191,500	$201,500
Site Wide Alternative No. 2	$1,410,000	$1,576,700	$2,986,700
Site Wide Alternative No. 3	$1,114,500	$1,663,800	$2,778,300
Site Wide Alternative No. 5	$1,917,000	$861,100	$2,778,100

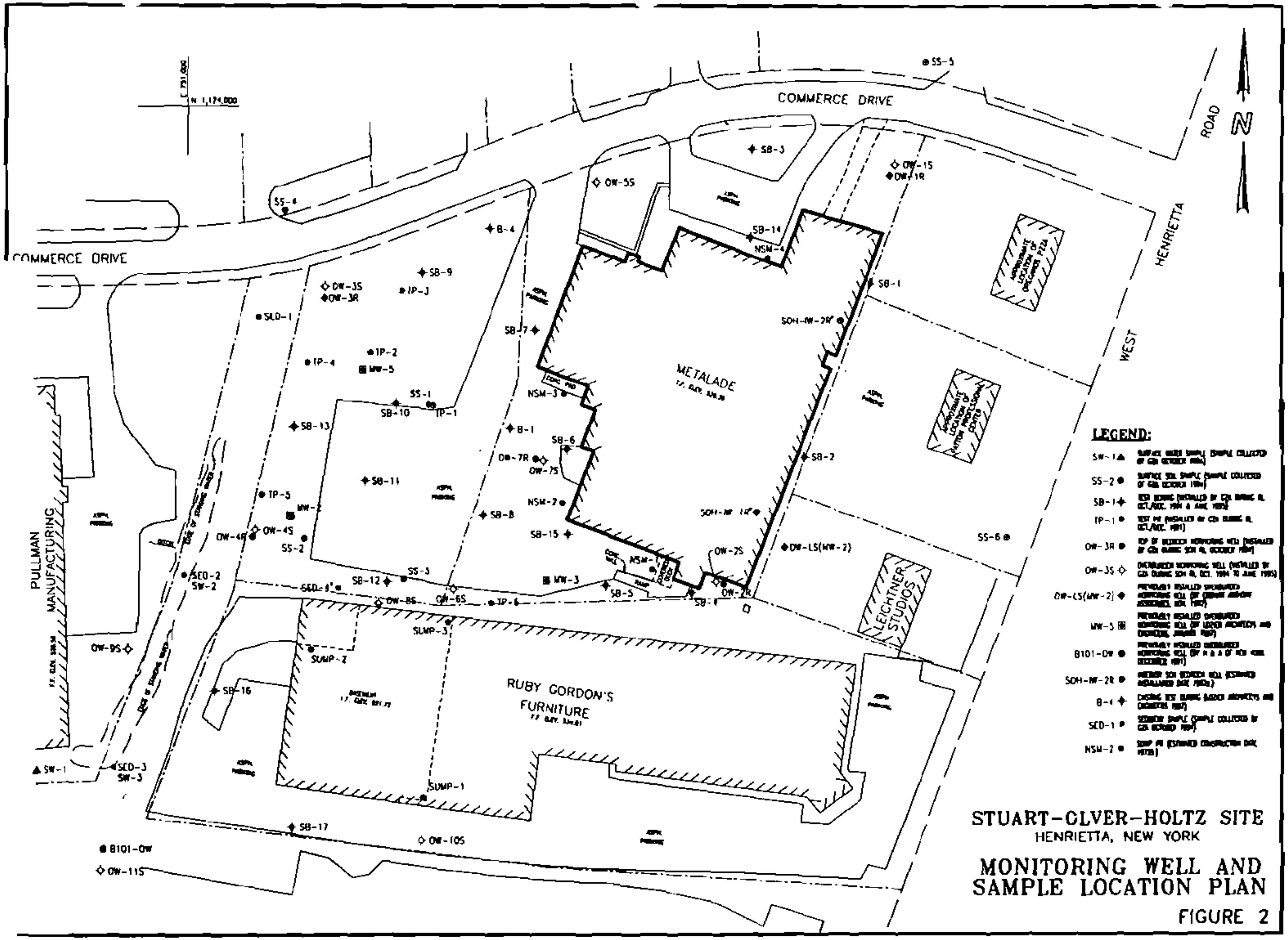


0 1000 2000 4000

SCALE IN FEET

STUART-OLVER-HOLTZ SITE
HENRIETTA, NEW YORK

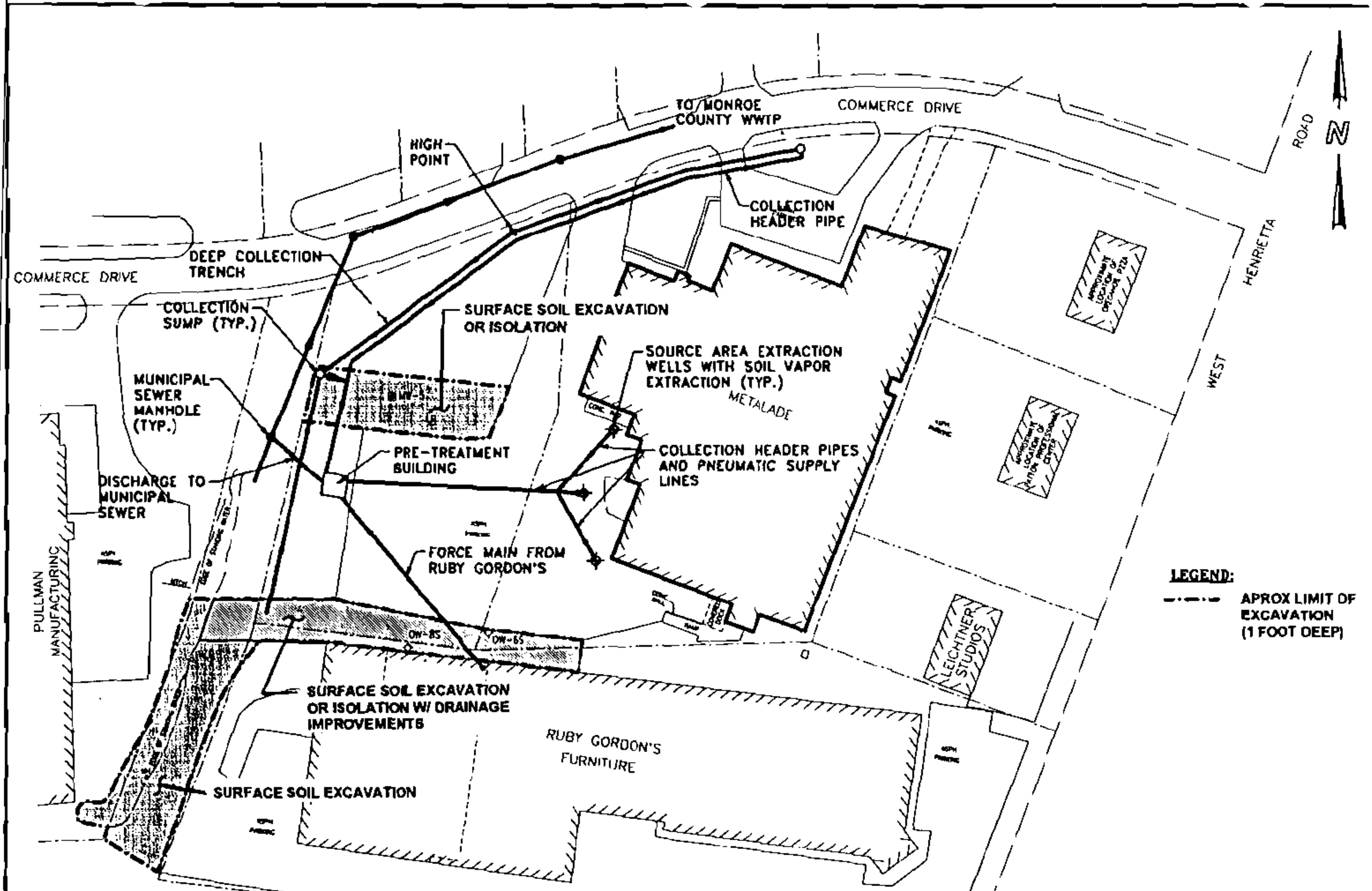
SITE LOCATION
FIGURE 1



STUART-OLVER-HOLTZ SITE
HENRIETTA, NEW YORK

MONITORING WELL AND SAMPLE LOCATION PLAN

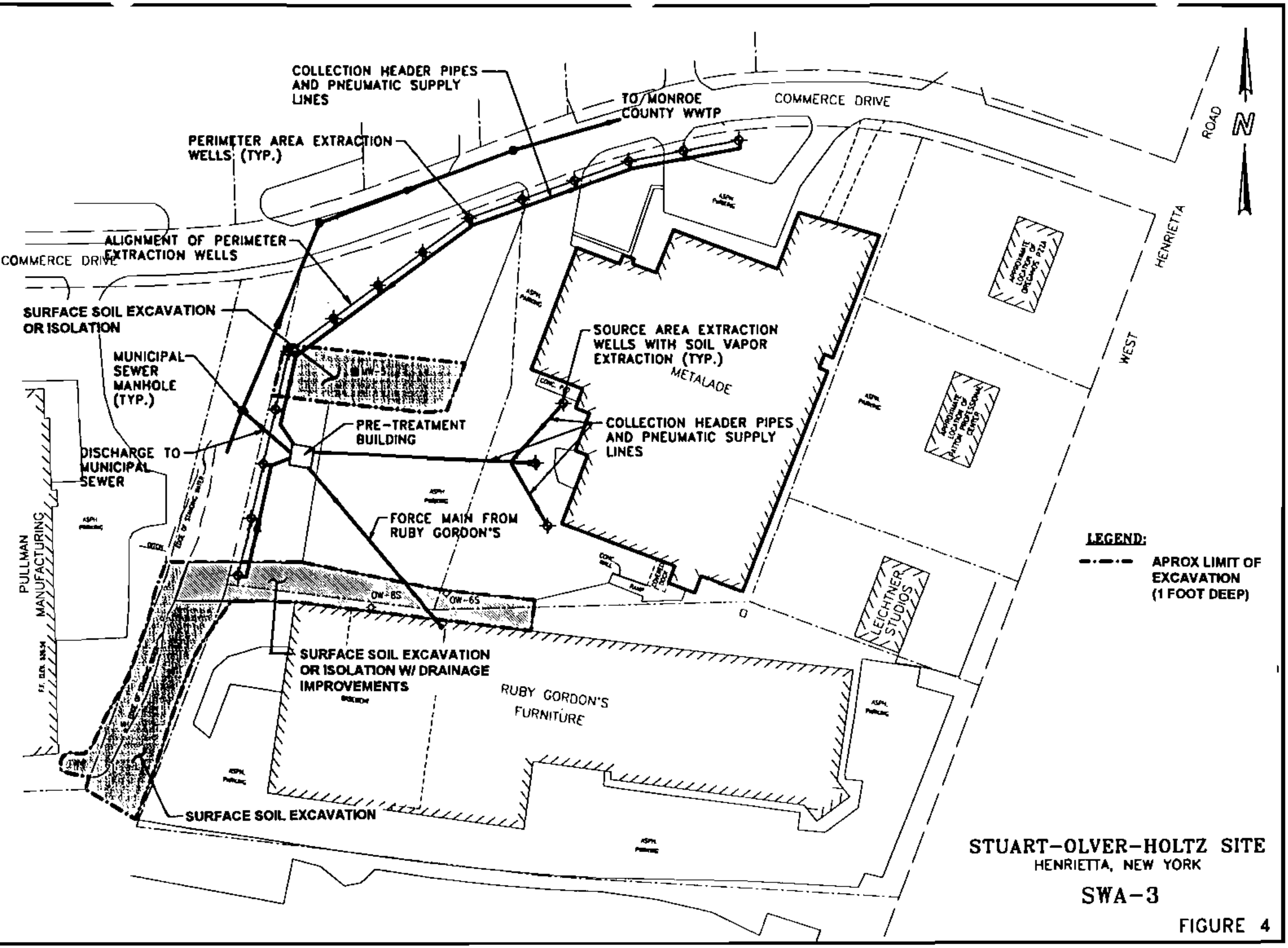
FIGURE 2



STUART-OLVER-HOLTZ SITE
HENRIETTA, NEW YORK

SWA-2

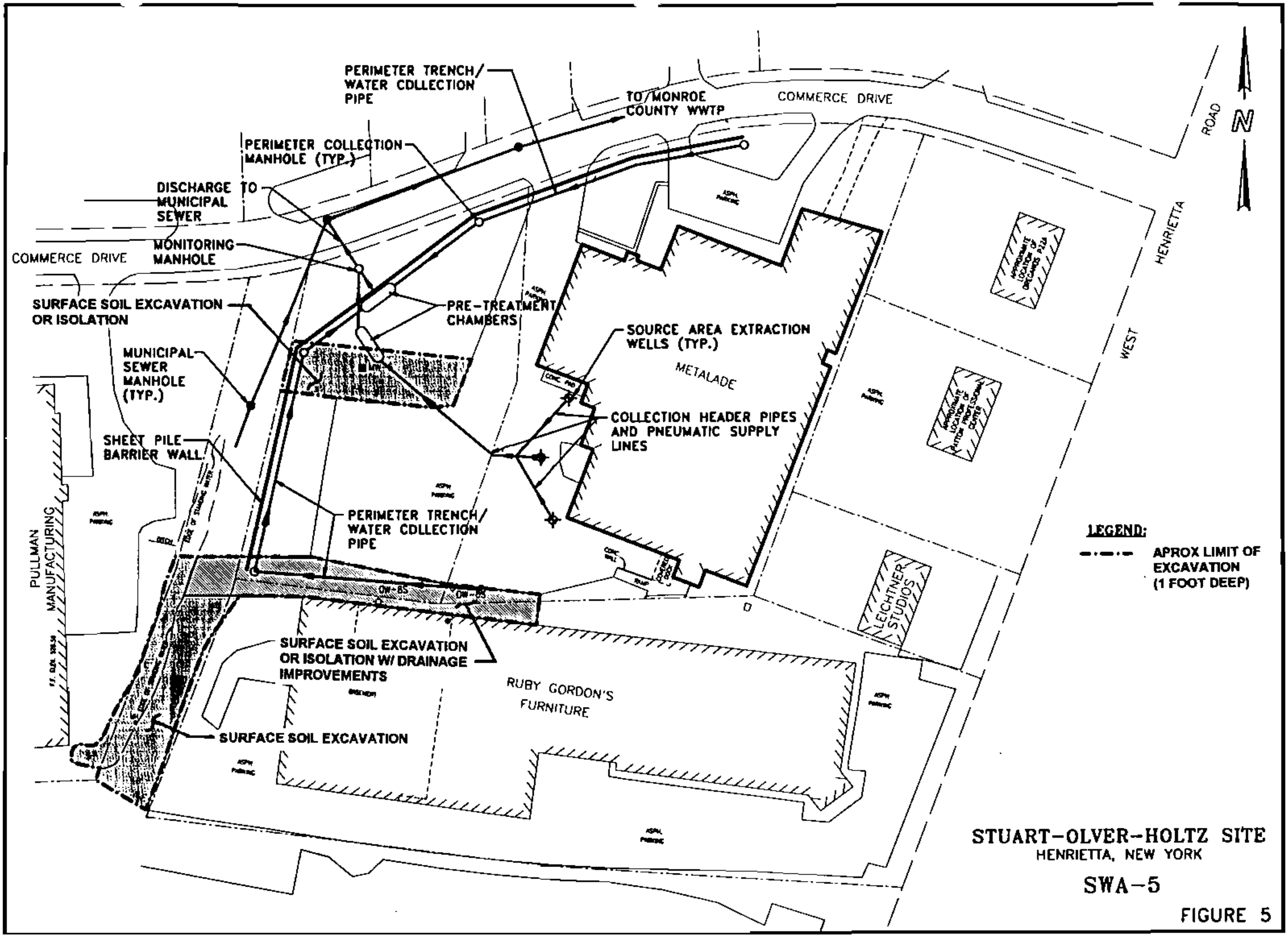
FIGURE 3



STUART-OLVER-HOLTZ SITE
HENRIETTA, NEW YORK

SWA-3

FIGURE 4



STUART-OLVER-HOLTZ SITE
HENRIETTA, NEW YORK

SWA-5

FIGURE 5