REMEDIAL ALTERNATIVES REPORT

BROWNFIELDS SITE INVESTIGATION/REMEDIAL ALTERNATIVES REPORT

Former Mohasco Mill Complex
Amsterdam, New York

CITY OF AMSTERDAM, NEW YORK

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3518001

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1.0 INTRODUCTION

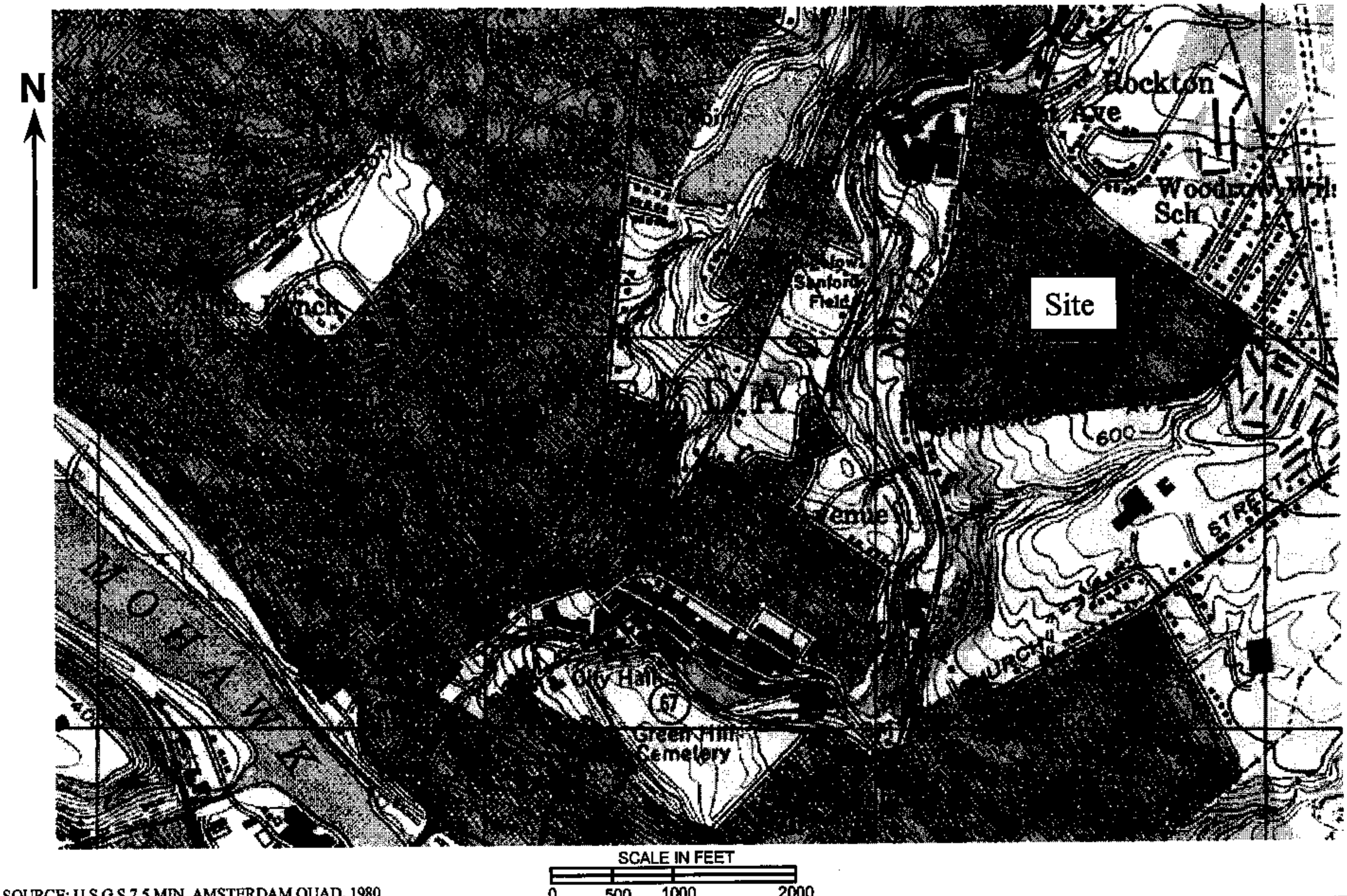
1.1 PURPOSE AND ORGANIZATION OF REPORT

The purpose of this report is to present the results of the Remedial Alternatives Report (RAR) for the former Mohasco Mill Complex, located in Amsterdam, New York. The RAR was conducted by Malcolm Pirnie, Inc. on behalf of the City of Amsterdam (City), under the Clean Water/Clean Air Act of 1996. The RAR has been prepared based on the results of the Site Investigation (SI) conducted by Malcolm Pirnie (Malcolm Pirnie, 1999). The RAR will evaluate remedial alternatives for the low concentrations of chlorinated solvents detected in the shallow soils at the site during the SI. The RAR is organized according to the outline provided in the New York State Department of Environmental Conservation (NYSDEC) document "Municipal Assistance Environmental Restoration Projects 'Brownfield Program' Procedures Handbook", December 1997. In accordance with the NYSDEC guidance.

1.2 BACKGROUND INFORMATION

1.2.1 Site Description

The former Mohasco Mill Complex is located at the southwest corner of the intersection of Forest Avenue and Lyon Street in the City of Amsterdam, Montgomery County, New York (Figure 1-1). The investigation area, which encompasses all demolished and standing buildings, except the steam plant (Building 25), is approximately 24 acres in size (Figure 1-2). The site is bordered to the north by Lyon Street, to the east by Forest Avenue, to the west by Locust Avenue, and to the south by Esquire Novelty Corporation, the Noteworthy Company, and residential properties. The North Chuctanunda Creek (Creek) bisects the site from the northeast to the southwest. The Mohawk River is located approximately 1.25 miles southwest of the site. Most of the central and northern section of



SOURCE: U.S.G.S 7.5 MIN. AMSTERDAM QUAD, 1980

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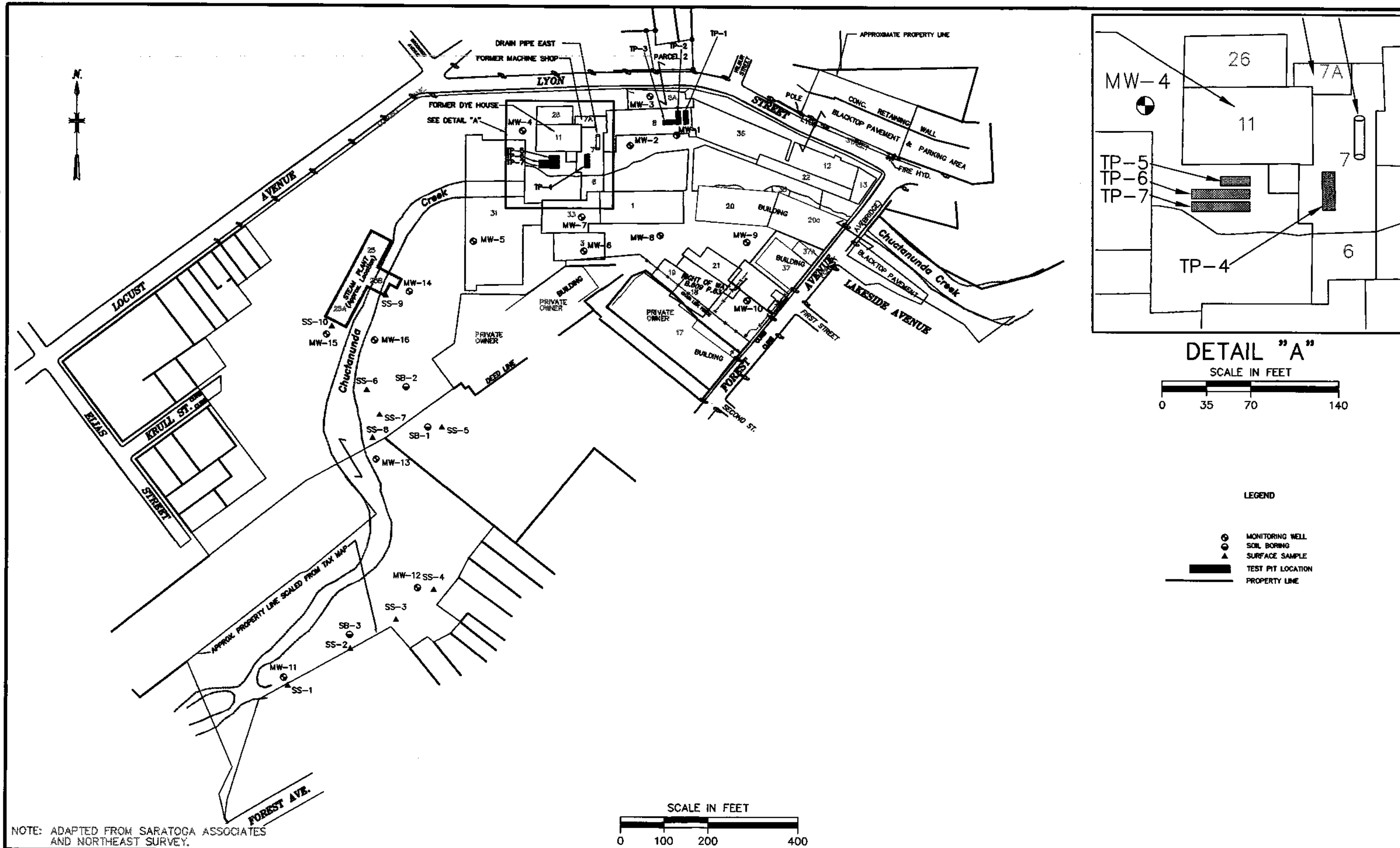
SITE LOCATION

FIGURE 1-1

User: LAMORE Spec: PIRNIE STANDARD File: I:\ACAD\PROJ\3518\0019\3518A17A.DWG Scale: 1:1 Date: 12/21/2000 Time: 14:11 Layout: Layout3



NOTE: ADAPTED FROM SARATOGA ASSOCIATES AND NORTHEAST SURVEY.

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SITE PLAN

FIGURE 1-2

the property is covered with demolition debris, building foundations, and the remains of buildings. Large multi-story buildings still exist in the northeast and southwest corners of the site.

1.2.2 Site History

The Mohasco Mill Complex was a carpet manufacturing facility, which operated from the late 1880s through 1984. Manufacturing processes conducted at the site consisted primarily of milling and weaving of raw materials and dye operations. Based on reviews of existing documents, it is believed that chemicals shipped to, used, and stored at the site included, but may not have been limited to, sulfuric acid, acetic acid, hydrogen peroxide, hydrosulfites, PCBs, and some metalized dyes. Carpet manufacturing activities ceased in 1984, after which time the site was leased for use as storage and office space until 1992. Most of the buildings at the site were destroyed by fires in 1992 and 1994. Debris from the buildings destroyed by the fire was left on-site and was used to backfill building foundations. The City of Amsterdam acquired the site in 1994. The site is currently unoccupied.

1.2.3 Nature and Extent of Contamination

As discussed in the SI Report, polycyclic aromatic hydrocarbons (PAHs), pesticides, metals, and polychlorinated biphenyls (PCBs) were detected in the fill, debris, surface soils, and/or sediments at the site at concentrations greater than the NYSDEC TAGM 4046 recommended soil cleanup objectives. The nature and extent of these contaminants is summarized below.

Fill and Debris

Overburden materials containing PAHs, pesticides, or metals at concentrations greater than the TAGM 4046 cleanup objectives were detected in the areas listed below.

- Concentrations of the PAHs benzo[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, and benzo[a]pyrene, as well as the pesticide dieldrin, exceeded the TAGM cleanup objectives in samples collected from the area south of Building 11 (test pits TP-5, TP-6, and TP-7) (SI Plate 2). The concentrations of benzo[a]anthracene and benzo[a]pyrene exceeded the cleanup objective by more than two orders of magnitude. The concentrations of the metals barium, copper, lead, and zinc exceeded the cleanup objective by at least one order of magnitude in the samples collected from this area.

- Concentrations of the pesticides aldrin and dieldrin exceeded the TAGM cleanup objective in the samples collected from the basement floor of Building 7 (test pit TP-4 and Drain Pipe East sample) (SI Plate 2). The concentration of dieldrin in the sample from TP-4 (Drain Pipe #2) was more than two orders of magnitude above the cleanup objective. The concentrations of the metals chromium, copper, lead, mercury, and zinc exceeded the cleanup objective by more than one order of magnitude in the TP-4 (Drain Pipe #2) sample. Cyanide, which has no cleanup objective, was also detected in this sample.

<u>Surface Soils</u>

Concentrations of at least one PAH exceeded the respective TAGM in all surface soil samples collected from the former steam plant area with the exception of surface soil samples SS-6 RE and SS-4 RE. Concentrations of benzo[a]anthracene exceeded the TAGM cleanup objective in surface soil samples SS-5, SS-7 RE, SS-8 RE, SS-9 RE, and SS-10 RE. Chrysene and benzo[b]fluoranthene concentrations exceeded the respective TAGM in surface soil samples SS-5 and SS-9 RE. Surface soil sample SS-5 contained concentrations of benzo[k]fluoranthene in exceedence of the TAGM cleanup objective. Concentrations of benzo[a]pyrene exceeded the TAGM cleanup objective in all surface soil samples with the exception of SS-4 RE and SS-6 RE. (SI Plate 2).

<u>Groundwater</u>

Although some compounds were detected at concentrations exceeding NYS Class GA groundwater standards, groundwater in the vicinity of the site does not appear to have been impacted by site activities, with the exception of the PCBs detected in MW-14 which are one order of magnitude above the Class GA standard.

Sediment

Concentrations of the PAHs benzo[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, and benzo[a]pyrene exceeded the TAGM cleanup objective in the stream sediments immediately downstream of the site (sample SD-2) (SI Figure 2-1). Screening of sediment samples as part of the ecological risk assessment indicates that a risk may exist for aquatic life in Chuctanunda Creek from the presence of PAHs, aldrin, antimony, arsenic, barium, copper, iron, lead, magnesium and zinc.

1.2.4 Contaminant Fate and Transport

In general, the organic contaminants detected at the site have low aqueous solubilities and vapor pressures, and high organic and octanol partition coefficients. Thus, they do not readily dissolve into water or volatilize into the atmosphere, and are more likely to adsorb onto soil or sediment particles. Once in the environment, these contaminants may be degraded biologically by microbial action or destroyed by photochemical processes (i.e., ultraviolet radiation from sunlight). However, they are usually slow to degrade and may persist in the environment for long periods of time.

The inorganic contaminants released to the environment tend to accumulate in the soil. Mobility of these contaminants in soil is low. Generally, inorganic contaminants do not exist in soluble forms for long and tend accumulate in bottom sediment or deeper soils.

Given the nature of the contaminants (i.e., low solubilities and high organic partition coefficients), the primary migration pathway for contaminants at the site is expected to be sediment/particulate transport by runoff and erosion associated with storm events, surface water flow in the Creek, and wind. Advective transport (by groundwater or surface water) and volatilization are not expected to be major routes of contaminant migration.

2.0 IDENTIFICATION AND SCREENING OF TECHNOLOGIES

2.1 INTRODUCTION

The technology identification and screening process established by the United States Environmental Protection Agency (USEPA) in the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, and used by the New York State Department of Environmental Conservation (NYSDEC), generally involves three steps:

1. Establishing the remedial action objectives (RAOs). The RAOs identify the contaminants, media of interest, exposure pathway(s) of concern, and express the goals of the remedial action. The RAOs at the former Mohasco Mill Complex have been developed based on the results of the Site Investigation (SI) conducted by Malcolm Pirnie.

2. Determining the appropriate general response actions (GRAs) to address the RAOs. The GRAs are medium-specific categories of actions that will satisfy the RAOs. They are general in nature, describing broad categories of response such as "treatment" or "disposal".

3. Identifying and screening of the technological process options that can effect the GRAs. The screening of technologies begins with a determination of "technology types" which refers to general categories of technologies that will accomplish the GRAs such as "extraction" of groundwater. Within each technology type there are a number of "process options" which fall into that category, such as "vertical wells".

GRAs and process options also consider the "no-action" alternative, which is the baseline against which the other remedial alternatives are compared. No-action includes GRAs such as deed restrictions, and long-term groundwater monitoring.

Following the third step, representative processes that can accomplish specific cleanup goals of the RAOs are selected and combined with processes which can achieve other RAOs to form remedial alternatives. The alternatives are subsequently screened to determine which are the most feasible for implementation.

2.2 REMEDIAL ACTION OBJECTIVES

The results of the SI indicate that exposure to soils, fill, debris, and sediment contaminated with PAHs, pesticides, and/or metals is the primary route of potential exposure for the former Mohasco Mill Complex. Thus, the Remedial Action Objective for the site is the prevention of contact with, and migration of, soils, fill, debris and sediments containing contaminants at concentrations greater than the NYSDEC TAGM 4046 recommended soil cleanup objectives.

The following sections identify GRAs and representative technological process options which may be appropriate for accomplishing the RAO.

2.3 IDENTIFICATION AND SCREENING OF GENERAL RESPONSE ACTIONS AND TECHNOLOGY PROCESS OPTIONS

In this section, GRAs are identified and potentially applicable technology types and process options for each GRA are evaluated. The GRAs which are applicable to soil and groundwater at the former Mohasco Mill complex include the no-action response, limited soil removal and soil capping, which has been subdivided into two sub-alternatives one with limited building demolition and one without building demolition.

2.3.1 No Action

The no-action GRA defines the minimum steps that would be taken at the former Mohasco Mill complex in the absence of remedial actions directed at the existing contamination. This includes the establishment of site controls. Deed restrictions would be placed on the property which notifies potential purchasers that contamination is present and that future use is restricted to operations which are consistent with the RAOs. Institutional controls do not directly affect the contaminated media, but do reduce the probability of incidental or unintentional contact with site contaminants.

Institutional controls may be necessary at the former Mohasco Mill complex in conjunction with other remedial actions because the continued effectiveness of the remedy may depend on maintaining such controls.

2.3.2 Limited Soil Removal

Limited soil removal would be completed in areas of elevated concentrations above the SCGs. The limited removal action would be coupled with off-site disposal of the contaminated media. The excavated areas will be re-seeded and grass established to reduce surface erosion. Limited building foundation demolition will also be undertaken in order to gain access to the removal areas and for worker safety.

2.3.3 Soil Capping

Soil capping would be used to limit the direct exposure to contaminants present at the surface. Soil capping would be combined with deed restrictions at the site which would limit the potential of exposure to the subsurface soils through excavation. This alternative has been sub-divided into two sub-alternatives, one of which includes building demolition, the other sub-alternative does not include building demolition.

2.4 DEVELOPMENT OF ALTERNATIVES

In this section, the remedial technologies for the site are developed in more detail. Each remedial technology will be assessed separately for effectiveness and implementability. The technologies will then be assembled into Remedial Alternatives (RAs) which comply with the RAO for the site.

2.4.1 Effectiveness Evaluation

Each alternative will be evaluated as to the extent to which it will eliminate exposures risks through reduction in toxicity, mobility, and volume of the contamination at the site. Both short-term and long-term effectiveness will be evaluated for each alternative.

2.4.2 Implementability Evaluation

The technical and administrative feasibility of constructing, operating, and maintaining each remedial alternative will be evaluated. Technical feasibility refers to the ability to construct, operate, and meet technical specifications, as well as the availability of specific equipment and technical specialists. It also includes required operation, maintenance, replacement, and monitoring of technical components of an alternative after the construction/initiation of the remedial alternative is complete. Administrative feasibility refers to compliance with the applicable rules and regulation (ARARs), as well as the ability to obtain approvals from other offices or agencies, treatment facilities, and/or disposal services.

2.4.3 No Action

The no-action alternative defines the minimum steps that would be taken at the site in the absence of remedial actions.

The no-action alternative would include the establishment of site controls and abandonment of monitoring wells. Site controls would include deed restrictions placed on the former Mohasco Mill property notifying potential purchasers that contamination is present and that future use is restricted to operations which are consistent with the RAO.

The effectiveness of the no-action alternative would likely be adequate for meeting the RAO in most instances, since residences in the area are supplied with drinking water via the City of Amsterdam Public Water System. However, due to the relatively shallow depth of the groundwater table (nine to 10 feet below grade) and the shallow soil contamination, workers involved in construction and/or excavation activities (i.e., utility work, building construction/demolition, etc.) could be exposed to contaminated soil and groundwater. In this case, the no-action alternative may not be adequate for meeting the RAO.

2.4.4 Limited Soil Removal

The limited soil removal alternative would involve the removal of shallow soil "hotspots" from the site and the off-site disposal of these soils at an approved landfill location.

The limited soil removal alternative would include the establishment of site controls and abandonment of monitoring wells. Site controls would be included in this alternative since soils exceeding the NYSDEC TAGM 4046 guidance would remain. These controls would include deed restrictions placed on the former Mohasco Mill property notifying potential purchasers that contamination is present and that future use is restricted to operations, which are consistent with the RAO. The effectiveness of the limited soil removal alternative would likely be adequate for meeting the RAO in most instances, since soils exceeding the SCGs would be removed and deed restriction would be in-place.

2.4.5 Soil Capping

The soil capping alternative will involve the placement of a soil cap over the affected soil, reducing direct exposure and limiting erosion of the soils exceeding the SCGs.

The soil capping alternative would include the establishment of site controls and abandonment of monitoring wells. Site controls would include deed restrictions placed on the former Mohasco Mill property notifying potential purchasers that contamination is present and that future use is restricted to operations which are consistent with the RAO.

The effectiveness of the soil capping alternative would likely be adequate for meeting the RAO in most instances, since direct exposure to the surface soils would be removed. However, due to the presence of soil in exceedance of the SCGs, workers involved in construction and/or excavation activities (i.e., utility work, building construction/demolition, etc.) could be exposed to contaminated soil. In this case, the soil capping alternative may not be adequate for meeting the RAO.

2.5 REMEDIAL ALTERNATIVES

In this section, the previously discussed technologies are assembled into three alternatives for remediation of the soil at the former Mohasco Mill complex.

2.5.1 Alternative 1: No Action

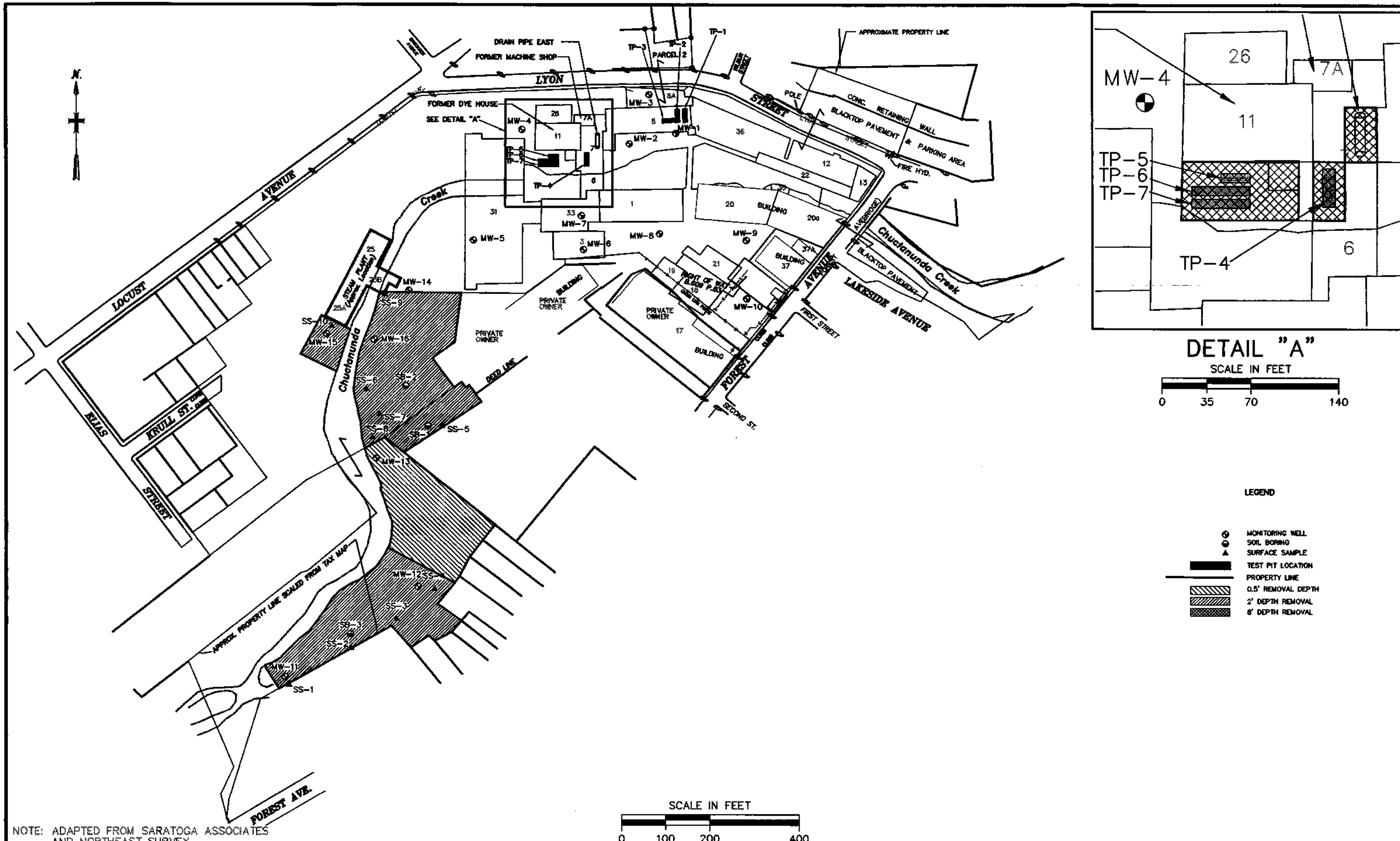
The no-action alternative has been developed as a baseline for comparison to other alternatives. The no-action alternative includes site controls and abandonment of monitoring wells with no removal of soil.

2.5.2 Alternative 2: Limited Soil Removal

Under Alternative 2, debris and soils in those areas that showed contaminant levels above the SCGs will be removed and disposed of off-site. A six-inch topsoil layer will be placed over those areas disturbed by the removal activities and the areas will be seeded. Once established, the vegetative cover will minimize erosion and the migration of soils. In addition, limited foundation demolition will be completed under this alternative. As necessary, clean, on-site soils and debris will be used as general fill in the area of the demolished foundations.

The majority of the soil removal work will be undertaken south of the creek, in the southwest portion of the site. Limited soil removal will also occur adjacent to the southern face of the power plant and in the vicinity of the foundations for Building 7 and Building 11. The approximate extent of work is shown on Figure 2-1. Soil removal activities in the southwest portion of the site and adjacent to the Power Plant will be limited to the upper two feet of the soils and debris. Adjacent to the foundations for Building 7 and Building 11, soils will be removed to a depth of approximately eight feet.

To facilitate the deeper excavation adjacent to the Building 7 and Building 11 foundations, and to improve worker safety during execution of the work, the foundations for Buildings 6, 7, 7A, and 11 will be demolished and backfilled with on-site material. Site monitoring wells will be abandoned and institutional controls will be established to prevent unsuitable future use of the site. In addition, access control structures will be installed to minimize exposure to those hazards that are not fully addressed under this alternative (e.g., falling debris, asbestos, etc.).



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ALTERNATIVE 2 – LIMITED SOIL REMOVAL

FIGURE 2-1

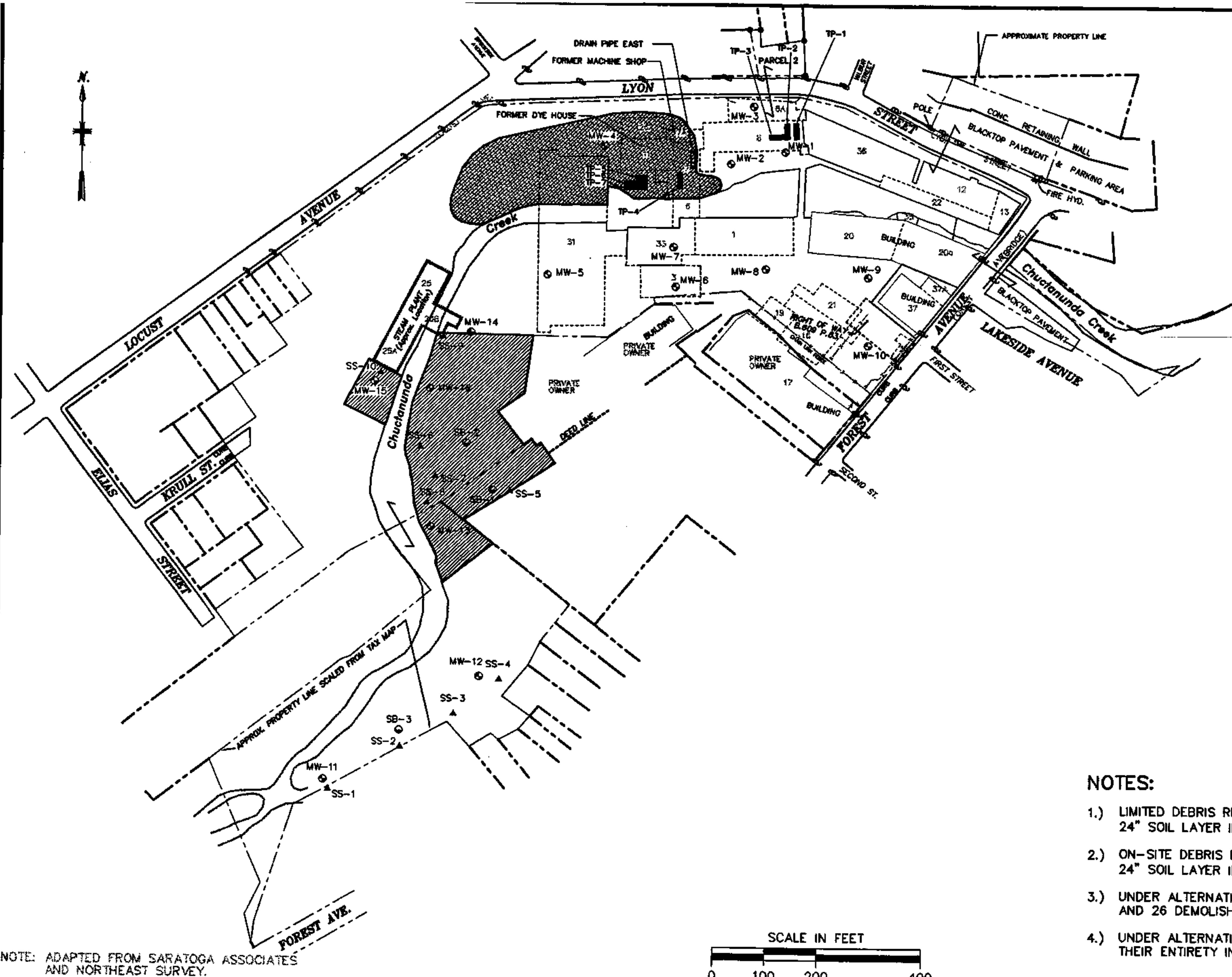
2.5.3 Alternative 3: Soil Capping with Building Demolition

Under Alternative 3, only limited quantities of large debris and the drain pipe, contaminated sediment, and adjacent soils beneath Building 7 will be removed from the site. It is anticipated that only the sediment/sludge within the pipe and the associated water used to flush the drain pipe will require disposal as a hazardous waste. All other debris and soils removed from the site are assumed to be non-hazardous.

Smaller debris and site soils will be graded and capped on-site with a soil layer. In the southwestern portion of the site, work will be limited to the removal and off-site disposal of large debris and the restoration of disturbed areas. In the central portion of the site rough grading of the debris will occur, a geotextile layer will be installed, and a 24-inch layer of soil will be placed and seeded. Along the stream bank, debris and soils will be removed, a slope stabilization fabric will be installed to minimize erosion and migration of site soils, and a soil layer will be placed and seeded. During construction and prior to the establishment of a vegetative cover, silt fencing, haybales, and other erosion controls will be installed and maintained.

In the northern portion of the site, sediment within the drain pipe will be flushed and collected for off-site disposal and the drain pipe and adjacent bedding material will be removed for off-site disposal. Additional debris and soil within the area will be rough graded, a layer of off-site general fill will be placed to act as a cushion layer, a geotextile fabric will be installed, and an additional 24-inch layer of soil will be placed and seeded.

In addition to the soil capping of nearly all areas of the site, Building 20 and Building 20A (including their foundations), the Power Plant stack, and the foundations for Buildings 7, 7A, 11, and 26 will be demolished. Demolition debris will be relocated and graded on site. Prior to the demolition of Buildings 20 and 20A, the abatement and off-site disposal of asbestos containing materials within the buildings will be completed. Additionally, to promote site use, the western face of Building 36 will be rehabilitated, a small walkway and handrail will be constructed along the creek, landscaping will be established, and approximately 20,000 square feet of asphalt will be restored or replaced. The approximate extent of work is shown on Figure 2-2.



NOTE: ADAPTED FROM SARATOGA ASSOCIATES AND NORTHEAST SURVEY.

LEGEND

- MONITORING WELL
- SOIL BORING
- SURFACE SAMPLE
- TEST PIT LOCATION
- PROPERTY LINE
- 24" SOIL CAP. SEE NOTE 1.
- 24" SOIL CAP. SEE NOTE 2.

NOTES:

1.) LIMITED DEBRIS REMOVED AND DISPOSED OF OFF-SITE. GEOTEXTILE AND 24" SOIL LAYER INSTALLED AND SEEDED.

2.) ON-SITE DEBRIS ROUGH GRADED. CUSHION SOIL LAYER, GEOTEXTILE, AND 24" SOIL LAYER INSTALLED AND SEEDED.

3.) UNDER ALTERNATIVE 3 & 3A, FOUNDATIONS FOR BUILDINGS 7, 7A, 11, AND 26 DEMOLISHED AND BACKFILLED.

4.) UNDER ALTERNATIVE 3 ONLY, BUILDINGS 20 AND 20A DEMOLISHED IN THEIR ENTIRETY INCLUDING ASBESTOS ABATEMENT ACTIVITIES.

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ALTERNATIVE 3 & 3A – SOIL CAPPING

FIGURE 2-2

Site monitoring wells will be abandoned and institutional controls will be established to prevent unsuitable future use of the site.

2.5.4 Alternative 3A: Soil Capping without Building Demolition

Alternative 3A is very similar to Alternative 3, but does not include the asbestos abatement or demolition of Building 20 and Building 20A, or the demolition of the stack. Likewise, the level of site restoration is substantially less under this alternative. Disturbed areas will be restored and seeded. However, the walkway and handrail along the creek, additional landscaping, and the asphalt restoration and replacement are not included. The approximate extent of work is shown on Figure 2-2.

Because hazards associated with the buildings will remain, access control structures will be constructed. Windows and doorways of abandoned buildings will be boarded-up, and limited perimeter fencing will be installed to provide a buffer around structures. Site monitoring wells will be abandoned and institutional controls will be established to prevent unsuitable future use of the site.

3.0 DETAILED ANALYSIS OF ALTERNATIVES

3.1 INTRODUCTION

This section presents a detailed analysis of the most appropriate alternatives for remediation of the former Mohasco Mill complex. Each alternative was assessed separately for effectiveness and implementability. During this screening process, the remedial alternatives identified in Section 2 were analyzed in detail using the criteria listed below.

3.1.1 Evaluation Criteria

Seven criteria were used to screen alternatives passing through the preliminary screening process. These criteria are as follows:

1. Overall protection of human health and the environment.
2. Compliance with New York State Standards, Criteria and Guidelines (SCGs).
3. Short-term effectiveness.
4. Long-term effectiveness and permanence.
5. Reduction of toxicity, mobility or volume of waste.
6. Implementability.
7. Costs including Capital, Annual Operations and Maintenance, and Present worth.

3.1.1.1 Overall Protection of Human Health and the Environment

These criteria are used to evaluate the adequacy of the remedial alternatives with respect to the protection of human health and the environment. The determination of the overall protection of human health and the environment for alternatives is primarily based on the short-term effectiveness, long-term effectiveness, permanence, and compliance with the SCGs.

3.1.1.2 Compliance with SCGs

SCGs are those requirements adapted from other statutes and other regulations which partly define remedial actions as cited in 6 NYCRR Part 375. Remedial alternatives were evaluated to determine whether they achieve SCGs under State and Federal environmental laws, public health laws, and state facility siting laws. Appendix A provides a summary of the SCGs.

3.1.1.3 Short-Term Effectiveness

An evaluation of the short-term impacts associated with the construction and implementation of each alternative was performed. The effect of each alternative on human health and the environment during the construction and implementation phases was evaluated considering the following:

- Protection of community health during construction and implementation of the proposed remedial alternative.
- Protection of workers health during construction and implementation of the proposed remedial alternative.
- Environmental impacts which may result from the construction and implementation of the proposed remedial alternative and the reliability of remedial actions to reduce or prevent these impacts.
- The time required to construct and implement each alternative.

3.1.1.4 Long-Term Effectiveness and Permanence

An evaluation of the long-term impacts associated with the construction and implementation of each alternative was performed. The long-term effectiveness and permanence of each remedial alternative was evaluated with respect to the quantity of residual chemicals remaining at the site after remediation goals have been met. This analysis focuses on the adequacy and reliability of controls necessary to manage the untreated waste and treatment residuals. The volume, toxicity, mobility, degree of which they remain hazardous, and tendency to bioaccumulate were evaluated for the residual chemicals associated with each alternative. Specific considerations included:

- Residual exposure risk.
- Adequacy of controls.
- Reliability of controls.

3.1.1.5 Reduction of Toxicity, Mobility or Volume of Waste

The degree to which each remedial alternative uses recycling or treatment technologies to permanently decrease toxicity, mobility or volume of the contaminants was evaluated. The effectiveness of each remedial alternative in addressing the predominant health and environmental risks posed by the site was also evaluated. Factors that were evaluated included:

- The treatment process used for the alternative and contaminants that would be treated for.
- Amount of contaminated media that will be remediated.
- Degree to which the toxicity, mobility, or volume of contaminated media will be reduced expressed as a percentage of reduction or order of magnitude.
- The extent to which the remedial action will be permanent.
- The quantity and composition of treatment residuals remaining after remediation accounting for persistence, toxicity, mobility and the tendency for bioaccumulation.
- The ability of the alternative to satisfy the statutory preference for treatment as a primary element.

3.1.1.6 Implementability

The technical and administrative feasibility of implementing each remedial alternative was evaluated according to the following criteria:

- **Technical Feasibility**: The difficulties and uncertainties related to the construction and implementation of a remedial alternative. This includes the reliability and means of monitoring the effectiveness of the remedial alternative.
- **Administrative Feasibility**: The amount of coordination with governing agencies needed to obtain necessary approvals or permits.

- **Availability of Services and Materials**: This includes the sufficiency of off-site treatment, storage and disposal capacity for contaminated media or treatment process residues and the accessibility of necessary equipment and specialists to implement innovative technologies.

3.1.1.7 Costs Including Capital, Annual Operations and Maintenance, and Present Worth

This criteria can be divided into capital costs, annual operations and maintenance (O&M) costs and net present worth costs. Capital costs consist of direct (construction) and indirect (non-construction and overhead) costs. A breakdown of the components included under each type of cost is presented below.

Direct Capital Costs

- **Construction and Equipment Costs**: Construction equipment, materials and labor required to install or implement a remedial action.
- **Site Development Costs**: Preparation of existing site.
- **Building and Service Costs**: Process and non process related buildings, utility connections and purchased services.
- **Disposal Costs**: Includes transportation and disposal of materials

Indirect Capital Costs

- **Engineering Expenses**: Treatability testing, design, drafting, construction supervision and administration.
- **Legal Fees, License and Permit Costs**: Technical and administrative costs to obtain necessary licenses or permits for installation or operation of remedial alternatives.
- **Initial Start-up Costs for Remedial Alternatives**: Labor and expense for start-up period immediately following construction.
- **Contingency Allowance**: Costs associated with unpredictable phenomenon.

Annual O&M Costs

These costs are for post-construction/implementation maintenance of remedial alternatives including:

- **Labor**: Includes wages, salaries, overhead and training for operations staff labor.
- **Maintenance Materials and Labor Costs**: Parts and labor associated with routine maintenance of equipment and facilities.
- **Purchased Services**: Sample collection, laboratory testing and professional fees as required for confirmatory testing and reporting.
- **Administrative Costs**: Additional costs associated with the administration of operations and maintenance not previously accounted for.
- **Replacement Costs**: Replacement of equipment or structures that degrade over time.
- **Site Reviews**: Cost of routine site reviews if remedial alternative leaves residual contamination on the site.

3.2 INDIVIDUAL ANALYSIS OF ALTERNATIVES

3.2.1 Alternative 1: No Action

3.2.1.1 Description

The no-action alternative will serve as the baseline representing the minimum steps to be taken for the site. This alternative will involve the implementation of a number of discrete items at the site. These are summarized as follows:

- Deed restrictions.
- Abandonment of monitoring well network.
- Natural Attenuation.

3.2.1.2 Overall Protection of Human Health and the Environment

Deed restrictions would limit the intrusiveness of future activity that could occur on the site and notify potential purchasers that contamination is present. Exposure to contaminated groundwater would be limited to construction/excavation activities in the study area since buildings and residences on surrounding properties are supplied with public drinking water.

3.2.1.3 Compliance with SCGs

In the short-term, this alternative would not meet the chemical-specific SCGs for the site. However, in the long-term, SCGs may be met due to on-going natural attenuation.

3.2.1.4 Short-Term Effectiveness

Community Protection

Standard practices for the containment and disposal of contaminated groundwater purged from monitoring wells during monitoring well abandonment would be employed.

Worker Protection

Implementation of this alternative would be undertaken using standard procedures for worker protection including the establishment of a Health and Safety Plan which would address the specific issues pertaining to implementation of this alternative and the appropriate protective measures which should be undertaken. All of the elements of this alternative employ common sampling procedures for which established health and safety procedures have been developed.

Environmental Impacts

Implementation of this alternative would have a negligible impact on the environment beyond that which already exists from the contamination.

Time Required to Implement

The time required to plan and implement this alternative is approximately one month.

3.2.1.5 Long-Term Effectiveness and Permanence

In the short-term, the no-action alternative does not significantly reduce the magnitude of the contamination. However, natural attenuation will likely reduce the magnitude of contamination the soil and groundwater in the long-term.

3.2.1.6 Reduction of Toxicity, Mobility, or Volume of Waste

The no-action alternative would not reduce the toxicity or mobility of the contaminants. However, in the long-term, natural attenuation would reduce the contaminant mass in the soil and groundwater.

3.2.1.7 Implementability

Effecting deed restrictions are actions that can be readily implemented for the site.

3.2.1.8 Cost

The capital, O&M and Present worth costs for Alternative 1 are presented in Table 3-1.

- **Capital Costs:** The probable capital cost to construct and implement Alternative 1 is $40,000.

- **O&M Costs:** The probable annual operations, monitoring and maintenance cost for Alternative 1 is $0.

- **Present Worth Cost:** This was not calculated since this alternative would occur immediately and will not require a long period of operation or maintenance.

TABLE 3-1
OPINION OF PROBABLE COST
ALTERNATIVE 1
NO ACTION ALTERNATIVE

DESCRIPTION	QUANTITY	UNIT	UNIT COST	COST
DIRECT CAPITAL COSTS:				
General Conditions		lump sum		$5,000
Drilling				
Monitoring Well Abandonment		lump sum		$15,000
Institutional Controls				
Effect deed restrictions on property		lump sum		$5,000
TOTAL DIRECT COSTS				$25,000
INDIRECT CAPITAL COSTS:				
Engineering and Permitting @ 25% of Total Direct Costs				$6,250
Contingency @ 25% of Total Direct Costs				$6,250
TOTAL INDIRECT COSTS				$12,500
TOTAL CAPITAL COSTS				$38,000
O&M COSTS:		lump sum		$0
TOTAL ANNUAL O&M COSTS				$0
PRESENT WORTH COSTS:				
Present worth of annual O&M costs, 5% rate over 30 years				$0
Total capital costs				$38,000
TOTAL PRESENT WORTH				$38,000
			Say	$40,000

Notes:

General Conditions includes H&S , mobilization, utilities, site Controls, surveying.
Total Capital and Annual O&M Costs are rounded up to the nearest $1,000.
Total Present Worth (Capitol and O&M Cost) rounded up to the nearest $10,000.

3.2.2 Alternative 2: Limited Soil Removal and No Action for Groundwater

3.2.2.1 Description

This alternative consists of limited soil removal at the "hotspots" identified during the SI. This alternative involves the implementation of a number of discrete items at the site, they are the same as Alternative 1 with the addition of the following items:

- "Hotspot" soil removal and disposal off-site

3.2.2.2 Overall Protection of Human Health and the Environment

The limited soil removal would remove and dispose contaminated soils off-site, thereby reducing the mass of soil contamination present at the site. Exposure to contaminated soils would occur to limited extent during the removal action but would be controlled through the implementation of health and safety controls.

3.2.2.3 Compliance with SCGs

This alternative would meet the chemical-specific SCGs for the site in the short-term in the "hotspot" areas. However the SCGs would not be met outside these areas, but through natural attenuation processes they may be met in the long-term.

3.2.2.4 Short-Term Effectiveness

Community Protection

Standard procedures for the containment of environmental media would be employed during excavation of the soils. A perimeter monitoring program would be developed to monitor for airborne contaminants which could be released by the construction of this alternative.

Worker Protection

Site workers could potentially become in contact with the site contaminants during excavation activities. Implementation of this alternative would be undertaken using standard procedures for worker protection including the establishment of a site safety and health plan, which would be required to alert workers to, and protect workers from, the health risk associated with site activities. All of the elements of this alternative employ common procedures for which established health and safety procedures have been developed.

Environmental Impacts

Implementation of this alternative would have a negligible impact on the environment beyond that which already exists in the subsurface.

Time Required to Implement

The time required to construct and implement this alternative is approximately six months.

3.2.2.5 Long-Term Effectiveness and Permanence

The soil removal action would reduce mass of contaminants present in the soil.

3.2.2.6 Reduction of Toxicity, Mobility, or Volume of Waste

Alternative 2 would reduce volume and mass of contaminants in the soil. Alternative 2 would have no effect on the toxicity of the contaminants since they will be transported and disposed of off-site.

3.2.2.7 Implementability

Alternative 2 would be readily implementable using locally available resources. The groundwater monitoring program could be implemented readily.

3.2.2.8 Cost

The Capital, O&M and Present worth costs for Alternative 2 are presented in Table 3-2.

- **Capital Costs:** The probable capital cost to construct and implement Alternative 2 is $3,717,000.
- **O&M Costs:** The probable annual operations, monitoring and maintenance cost for Alternative 2 is $0.

TABLE 3-2
OPINION OF PROBABLE COST
ALTERNATIVE 2
Limited Soil Removal

DESCRIPTION	QUANTITY	UNIT	UNIT COST	COST
DIRECT CAPITAL COSTS:				
Excavation and Loading	10,600	cy	$10.00	$106,000
Excavation and Loading	3,900	cy	$25.00	$97,500
Hauling and Disposal	14,500	cy	$130.00	$1,885,000
Topsoil and Seeding	24,000	sy	$6.75	$162,000
Access Control Structures	1	ls	$31,000.00	$31,000
Demolition of Foundations	20,000	sf	$2.00	$40,000
Backfill of Foundations with On-site Material	3,700	cy	$5.00	$18,500
Drilling				
Monitoring Well Abandonment		lump sum		$15,000
Institutional Controls				
Effect deed restrictions on property		lump sum		$5,000
General Conditions (5 percent of construction subtotal)				$118,000
TOTAL DIRECT COSTS				$2,478,000
INDIRECT CAPITAL COSTS:				
Engineering and Permitting @ 25% of Total Direct Costs				$619,500
Contingency @ 25% of Total Direct Costs				$619,500
TOTAL INDIRECT COSTS				$1,239,000
TOTAL CAPITAL COSTS				$3,717,000
O&M COSTS:		lump sum		$0
TOTAL ANNUAL O&M COSTS				$0
PRESENT WORTH COSTS:				
Present worth of annual O&M costs, 5% rate over 30 years				$0
Total capital costs				$3,717,000
TOTAL PRESENT WORTH				$3,717,000
			Say	$3,720,000

Notes:

General Conditions includes H&S , mobilization, utilities, site Controls, surveying.
Total Capital and Annual O&M Costs are rounded up to the nearest $1,000.
Total Present Worth (Capitol and O&M Cost) rounded up to the nearest $10,000.

- **Present Worth Cost:** Over a 30 year monitoring period, the probable net present worth for this alternative is $3,720,000. This was calculated using a 5% annual discount rate over the 30-year period.

3.2.3 Alternative 3: Soil Capping with Building Demolition

3.2.3.1 Description

Alternative 3 consists of a the installation of a soil cap. This alternative involves all of the items listed in Alternative 1, plus the following:

- Regrading of the site debris.
- Installation of a soil cap.
- Building demolition.

3.2.3.2 Overall Protection of Human Health and the Environment

Deed restrictions would limit the intrusiveness of future activity that could occur on the site and notify potential purchasers that contamination is present. Exposure to contaminated groundwater would be limited to construction/excavation activities in the study area since buildings and residences on surrounding properties are supplied with public drinking water. Direct exposure to the surface soils and the erosion of these soils would be reduce due to the presence of the soil cap.

3.2.3.3 Compliance with SCGs

This alternative will not meet the chemical-specific SCGs for the site in the short-term, since removal of contaminants will not occur. However, long-term through natural attenuation processes SCGs will likely be met.

3.2.3.4 Short-Term Effectiveness

Community Protection

Standard procedures for the containment of environmental media would be employed during installation of the soil cap, grading of materials, and building demolition. A perimeter monitoring program would be developed to monitor for airborne contaminants which could be released by the construction of this alternative.

Worker Protection

Site workers could potentially become in contact with the site contaminates during material grading and soil cap placement. Implementation of this alternative would be undertaken using standard procedures for worker protection including the establishment of a site safety and health plan, which would be required to alert workers to, and protect workers from, the health risk associated with site activities. All of the elements of this alternative employ common procedures for which established health and safety procedures have been developed.

Environmental Impacts

Implementation of this alternative would have a negligible impact on the environment beyond that which already exists in the subsurface.

Time Required to Implement

The time required to construct and implement this alternative is approximately six months.

3.2.3.5 Long-Term Effectiveness and Permanence

The effects of natural attenuation processes will likely reduce the mass of contaminants present in the soil and groundwater and will not be reversible.

3.2.3.6 Reduction of Toxicity, Mobility, or Volume of Waste

Alternative 3 would reduce the volume and mass of contaminants in the groundwater and in the soils over the long-term through the natural attenuation processes.

3.2.3.7 Implementability

Alternative 3 is readily implementable using locally available resources. The groundwater monitoring program could be implemented readily.

3.2.3.8 Cost

The Capital, O&M and Present worth costs for Alternative 3 are presented in Table 3-3.

- **Capital Costs:** The probable capital cost to construct and implement Alternative 3 is $2,505,410.
- **O&M Costs:** The probable annual operations, monitoring and maintenance cost for Alternative 3 is $5,000.
- **Present Worth Cost:** Over a 30 year monitoring period, the probable net present worth for this alternative is $2,590,000. This was calculated using a 5% annual discount rate over the 30-year period.

3.2.4 Alternative 3A: Soil Capping without Building Demolition

3.2.4.1 Description

Alternative 3A consists of a the installation of a soil cap. This alternative involves all of the items listed in Alternative 1, plus the following:

- Regrading of the site debris
- Installation of a soil cap

3.2.4.2 Overall Protection of Human Health and the Environment

Deed restrictions would limit the intrusiveness of future activity that could occur on the site and notify potential purchasers that contamination is present. Exposure to contaminated groundwater would be limited to construction/excavation activities in the study area since buildings and residences on surrounding properties are supplied with public drinking water. Direct exposure to the surface soils and the erosion of these soils would be reduce due to the presence of the soil cap.

3.2.4.3 Compliance with SCGs

This alternative will not meet the chemical-specific SCGs for the site in the short-term, since removal of contaminants will not occur. However, long-term through natural attenuation processes SCGs will likely be met.

TABLE 3-3
OPINION OF PROBABLE COST
ALTERNATIVE 3
Soil Capping **with** Building Demolition

DESCRIPTION	QUANTITY	UNIT	UNIT COST	COST
ENVIRONMENTAL RESTORATION COSTS				
DIRECT CAPITAL COSTS:				
Foundation Demolition (Bldgs 7, 7A, 11, 26)	26,250	sf	$2.00	$52,500
Debris Relocation/Placement (Building Foundations & Misc.)	5,840	cy	$6.50	$37,960
Stream Bank Clean-up	1,000	cy	$25.00	$25,000
Installation of Soil Stabilization Along Stream Bank	22,500	sf	$2.00	$45,000
General Fill - Purchase & Placement	2,000	cy	$15.00	$30,000
Geotextile Separation Fabric (North Area)	72,500	sf	$0.20	$14,500
Geotextile Separation Fabric (Central Area)	95,000	sf	$0.20	$19,000
Cover Material - Purchase & Placement (North Area)	5,500	cy	$25.00	$137,500
Cover Material - Purchase & Placement (Central Area)	7,000	cy	$25.00	$175,000
Clearing & Grubbing	0.5	acres	$5,000.00	$2,500
Seeding	167,500	sf	$0.08	$13,400
Plantings	100	trees	$150.00	$15,000
Additional Environmental/Erosion Controls	1	ls	$5,000.00	$5,000
Asbestos Abatement Beneath Building 31	1	ls	$55,000.00	$55,000
Remove and Dispose of Large Debris Off-site	200	tons	$120.00	$24,000
Remove and Dispose of Haz. Pipe Sediment & Adjac. Mat'ls.	1	ls	$25,000.00	$25,000
Drilling				
Monitoring Well Abandonment		lump sum		$15,000
Institutional Controls				
Effect deed restrictions on property		lump sum		$5,000
General Conditions (5 percent of construction subtotal)				$34,900
TOTAL DIRECT COSTS				$731,260
INDIRECT CAPITAL COSTS				
Engineering and Permitting @ 25% of Total Direct Costs				$182,900
Contingency @ 20% of Total Direct Costs				$146,300
TOTAL INDIRECT COSTS				$329,200
TOTAL CAPITAL COSTS - ENVIRONMENTAL RESTORATION				**$1,060,460**
BUILDING DEMOLITION				
Building 20 & 20A Demolition	105,000	sf	$4.00	$420,000
Building 20 & 20A Foundation Demolition	20,000	sf	$2.00	$40,000
Building 20 & 20A Asbestos Abatement	1	ls	$300,000.00	$300,000
Stack Demolition	1	ls	$25,000.00	$25,000
Debris Relocation/Placement (Bldgs. 20, 20A, and Stack)	11,500	cy	$6.50	$74,750
Restoration of Bldg. 36 - Western Face	3,200	sf	$3.50	$11,200
Pavement Restoration/Replacement	20,000	sf	$1.50	$30,000
Concrete Walkway	6,400	sf	$3.00	$19,200
Handrail	1,600	lf	$18.00	$28,800
General Conditions (5 percent of construction subtotal)				$47,500
TOTAL DIRECT COSTS				$996,450
INDIRECT CAPITAL COSTS:				
Engineering and Permitting @ 25% of Total Combined Direct Costs				$249,200
Contingency @ 20% of Total Combined Direct Costs				$199,300
TOTAL INDIRECT COSTS				$448,500
TOTAL CAPITAL COSTS - BUILDING DEMOLITION				**$1,444,950**
O&M COSTS:				
Maintaining Erosion Controls/Site Inspection		lump sum		$5,000
TOTAL ANNUAL O&M COSTS				$5,000
PRESENT WORTH COSTS:				
Present worth of annual O&M costs, 5% rate over 30 years				$75,800
Total Combined Alternative 3 Capital Costs				$2,505,500
TOTAL PRESENT WORTH COST FOR ALTERNATIVE 3				**$2,590,000**

Notes:

General Conditions includes H&S , mobilization, utilities, site Controls, surveying.
Total Capital and Annual O&M Costs are rounded up to the nearest $1,000.
Total Present Worth (Capital and O&M Cost) rounded up to the nearest $10,000.

3.2.4.4 Short-Term Effectiveness

Community Protection

Standard procedures for the containment of environmental media would be employed during installation of the soil cap and grading of materials. A perimeter monitoring program would be developed to monitor for airborne contaminants which could be released by the construction of this alternative.

Worker Protection

Site workers could potentially become in contact with the site contaminates during material grading and soil cap placement. Implementation of this alternative would be undertaken using standard procedures for worker protection including the establishment of a site safety and health plan, which would be required to alert workers to, and protect workers from, the health risk associated with site activities. All of the elements of this alternative employ common procedures for which established health and safety procedures have been developed.

Environmental Impacts

Implementation of this alternative would have a negligible impact on the environment beyond that which already exists in the subsurface.

Time Required to Implement

The time required to construct and implement this alternative is approximately six months.

3.2.4.5 Long-Term Effectiveness and Permanence

The effects of natural attenuation processes will likely reduce the mass of contaminants present in the soil and groundwater and will not be reversible.

3.2.4.6 Reduction of Toxicity, Mobility, or Volume of Waste

Alternative 3A would reduce the volume and mass of contaminants in the groundwater and in the soils over the long-term through the natural attenuation processes.

3.2.4.7 Implementability

Alternative 3A is readily implementable using locally available resources. The groundwater monitoring program could be implemented readily.

3.2.4.8 Cost

The Capital, O&M and Present worth costs for Alternative 3A are presented in Table 3-4.

- **Capital Costs:** The probable capital cost to construct and implement Alternative 3A is $904,000.
- **O&M Costs:** The probable annual operations, monitoring and maintenance cost for Alternative 3A is $0.
- **Present Worth Cost:** Over a 30 year monitoring period, the probable net present worth for this alternative is $904,000. This was calculated using a 5% annual discount rate over the 30-year period.

3.3 COMPARATIVE ANALYSIS

3.3.1 Overview

The Remedial Action Objectives for the former Mohasco Mill complex are concerned with the prevention of human contact with contaminated soil and groundwater through the remediation of the soil and groundwater. The three alternatives presented provide varying levels of remedial actions. Alternative 1, the no-action alternative defines the minimum steps to be taken for remediation of the site. This alternative, alone, may meet the RAO over the long-term. All of the remaining alternatives include the components of the no-action alternative.

TABLE 3-4
OPINION OF PROBABLE COST
ALTERNATIVE 3A
Soil Capping **without** Building Demolition

DESCRIPTION	QUANTITY	UNIT	UNIT COST	COST
DIRECT CAPITAL COSTS:				
Foundation Demolition (Bldgs 7, 7A, 11, 26)	20,000	sf	$2.00	$40,000
Debris Relocation/Placement (All Bldgs., Stack, Misc.)	5,840	cy	$6.50	$37,960
Rehab of Bldg. 31 Slab for Pedestrian Use	1	ls	$10,000.00	$10,000
Restoration of Bldg. 36 - Western Face	3,200	sf	$3.50	$11,200
Stream Bank Clean-up	1,000	cy	$25.00	$25,000
General Fill - Purchase & Placement	2,000	cy	$15.00	$30,000
Geotextile Separation Fabric	65,500	sf	$0.20	$13,100
Cover Material - Purchase & Placement	3,500	cy	$25.00	$87,500
Clearing & Grubbing	0.5	acres	$5,000.00	$2,500
Seeding	65,500	sf	$0.05	$3,275
Pavement Restoration/Replacement	20,000	sf	$1.50	$30,000
Concrete Walkway	6,400	sf	$3.00	$19,200
Relocate Debris Near Power Plant	24,000	sy	$6.75	$162,000
Topsoil and Seed Area Near Power Plant	1,450	cy	$5.00	$7,250
Handrail	1,600	lf	$18.00	$28,800
Plantings	100	trees	$150.00	$15,000
Access Control Structures	1	ls	$31,000.00	$31,000
Drilling				
Monitoring Well Abandonment		lump sum		$15,000
Institutional Controls				
Effect deed restrictions on property		lump sum		$5,000
General Conditions (5 percent of construction subtotal)				$28,700
TOTAL DIRECT COSTS				$602,485
INDIRECT CAPITAL COSTS:				
Engineering and Permitting @ 25% of Total Direct Costs				$150,621
Contingency @ 25% of Total Direct Costs				$150,621
TOTAL INDIRECT COSTS				$301,243
TOTAL CAPITAL COSTS				$904,000
O&M COSTS:		lump sum		$5,000
TOTAL ANNUAL O&M COSTS				$5,000
PRESENT WORTH COSTS:				
Present worth of annual O&M costs, 5% rate over 30 years				$75,761
Total capital costs				$904,000
TOTAL PRESENT WORTH				$979,761

Notes:

General Conditions includes H&S , mobilization, utilities, site Controls, surveying.

Total Capital and Annual O&M Costs are rounded up to the nearest $1,000.

Total Present Worth (Capitol and O&M Cost) rounded up to the nearest $10,000.

Alternative 2, limited soil removal, would also likely meet the RAO over the short and long-term. Alternative 3 and 3A, soil capping alternatives, would also likely meet the RAO over the long-term.

3.3.2 Adequacy of the Alternatives to Meet the RAOs

All of the remaining alternatives would be adequate to meet the RAO over the long-term. Alternative 1 would likely require the longest amount of time to meet the RAO. Alternative 2 would likely meet the RAO more quickly than Alternative 1. Alternatives 1 and 3/3A would likely require similar operational periods to meet the RAO, however, due to the presence of the soil cap Alternative 3/3A would meet the short-term goals of reducing exposure. Alternative 2 would likely achieve the RAO in the shortest period of time.

3.3.3 Implementability

All of the elements of each alternative examined could be implemented readily using locally available resources.

3.3.4 Cost

Alternative 1, the no-action alternative, would be the least expensive, followed by Alternative 3A. Alternative 2, would be the most expensive alternative.

APPENDIX A

Summary of SCGs

TABLE A-1
Former Mohasco Mill Complex
Summary of Potential Chemical-Specific SCGs

Volatile Organic Compounds	NYSDEC TAGM 4046 Soil Cleanup Objective (ug/kg)		NYSDEC Class GA Standard (ug/l)
Acetone	200		5
Semi-Volatile Organic Compounds			
3+4-Methyphenols	5643 (b)		5
2,4-Dimethylphenol	No Standard		5
Naphthalene	81,510		5
2-Methylnaphthalene	228,226		5
Acenaphthylene	257,070		5
Acenaphthene	313,500		5
Dibenzofuran	38,874		5
Diethylphthalate	44,517		5
Fluorene	313,500		5
Phenanthrene	313,500		5
Anthracene	313,500		5
Carbazole	No Standard		5
Fluoranthene	313,500		5
Pyrene	313,500		5
Benzo[a]anthracene	224		5
Chysene	2,508		5
bis(2-Ethylhexyl)phtha	50,000		5
Benzo[b]fluoranthene	6,897		5
Benzo[k]fluoranthene	6,897		5
Benzo[a]pyrene	61		5
Ideno[1,2,3-cd]pyrene	20,064		5
Dibenz[a,h]anthracene	No Standard		5
Benzo[g,h,i]perylene	313500		5
PCB/Pesticide (ug/kg)			
PCBs	1,000	Aroclor 1260	0.09
Aldrin	41		ND
Dieldrin	44		0.004
4-4'-DDE	2,100		0.2
Endrin	100		ND
4,4'-DDD	2,900		0.2
4,4'-DDT	2100		0.2
alpha-Chlordane	540		0.05
TAL Metals (mg/kg)			
Aluminum	6,170 (b)		No Standard
Antimony	No Standard		3
Arsenic	7.5		25
Barium	300		1,000
Cadmium	1		5
Calcium	42,500 (b)		No Standard
Chromium	10		50
Cobalt	30		No Standard
Copper	25		200
Iron	17,100 (b)		300
Lead	6.6 (b)		25
Magnesium	10,100 (b)		35,000
Manganese	253 (b)		300
Mercury	0.1		0.7
Nickel	13		No Standard
Potassium	1,410 (b)		No Standard
Selenium	2		10
Silver	ND (b)		50
Sodium	342 (b)		20,000
Thallium	ND (b)		4
Vanadium	150		No Standard
Zinc	48.1 (b)		300
Cyanide	No Standard		200

(b) Based on site background