Environmental Restoration
PROPOSED REMEDIAL ACTION PLAN

Former Mohasco Mill Site
City of Amsterdam, Montgomery County
Site No. B-00052-4
February 2001

SECTION 1: SUMMARY AND 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 a remedy to address the potential threat to public health and/or the environment created by the presence of hazardous substances at the Former Mohasco Mill brownfield project.

The 1996 Clean Water/ Clean Air Bond Act provides funding to municipalities for the investigation and cleanup of brownfields. Brownfields are abandoned, idled or under-used properties where redevelopment is complicated by real or perceived environmental contamination. They typically are former industrial or commercial properties where operations may have resulted in environmental contamination. Brownfields often pose not only environmental, but legal and financial burdens on communities. Under the Environmental Restoration (Brownfields) Program, the State provides grants to municipalities to reimburse up to 75 percent of eligible costs for site investigation and remediation activities. Once remediated the property can then be reused.

As more fully described in Sections 3 and 4 of this document, industrial operations and fires have resulted in the disposal and deposition of a number of hazardous substances at the site. These substances include PCBs, semi-volatile organic compounds, and metals, some of which were released or have migrated from the site to an area of sediments in the North Chuctanunda Creek, a Class C protected stream. These disposal activities have resulted in the following threat to the public health and/or the environment:

- a potential threat to human health associated with direct contact with contaminated surficial soils.
- an environmental threat associated with the impacts of contaminants in soils leaching into the North Chuctanunda Creek.

In order to eliminate or mitigate the potential threats to the public health and/or the environment that the hazardous substances

disposed at the Former Mohasco Mill Complex brownfield site have caused, the following remedy is proposed to allow for a park/business office complex at the site:

- soil cover with building demolition
- deed restrictions placed on the property limiting the property to recreational, commercial, or industrial uses. Deed restrictions will also prevent the use of groundwater at the site and require appropriate action (excavation and proper disposal) should intrusive activities disturb contaminated soils.

The proposed remedy, discussed in detail in Section 7 of this document, is intended to attain the remediation goals selected for this site in Section 6 of this Proposed Remedial Action Plan (PRAP) in conformity with applicable standards, criteria, and guidance (SCGs).

This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for this preference. The NYSDEC will select a final remedy for the site only after careful consideration of all comments received 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 is a summary of the information that can be found in greater detail in the Site Investigation (SI) and Remedial Alternatives Report (RAR) available at the document repositories.

To better understand the site and the investigations conducted, the public is encouraged to review the project documents at the following repositories:

City of Amsterdam Community
and Economic Development
Amsterdam City Hall
61 Church Street
Amsterdam, NY 12010
8:00 AM to 4:00 PM
Monday - Friday
(518) 843-5190

Amsterdam Public Library
28 Church Street
Amsterdam, N.Y. 12010
(518) 842-1080
Monday & Thursday 10 AM - 8 PM
Tues., Wed., & Fri., 10 AM - 5:30 PM
Sat. 10 AM - 4 PM

NYSDEC
Region IV
1150 North Westcott Road
Schenectady, N.Y. 12306
Attention: Mr. Eric Hamilton
8:30 AM to 4:30 PM
Monday - Friday

NYSDEC
Rm. 228
Bureau of Central Remedial Action
Division of Environmental Remedation
50 Wolf Road
Albany, N.Y. 12233-7010
Attention: Mr. Brian Davidson
8:30 AM to 4:30 PM
Monday - Friday

The NYSDEC seeks input from the community on all PRAPs. A public comment

period has been set from February 7, 2001 to March 24, 2001 provide an opportunity for public participation in the remedy selection process for this site. A public meeting is scheduled for March 1, 2001 at the Amsterdam City Hall beginning at 7:00 PM.

At the meeting, the results of the SI/RAR will be presented along with a summary of the proposed remedy. After the presentation, a question and answer period will be held, during which you can submit verbal or written comments on the PRAP.

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

Comments will be summarized and responses provided in the Responsiveness Summary section of the Record of Decision. The Record of Decision is the NYSDEC's final selection of the remedy for this site. Written comments may be sent to Mr. Davidson at the above address through March 24, 2001.

SECTION 2: SITE LOCATION AND DESCRIPTION

The former Mohasco Mill Complex is an approximately 23.5 acre site located at the southwest corner of the intersection of Forest Avenue and Lyon Street within the City of Amsterdam, Montgomery County, New York. The North Chuctanunda 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 the property is covered by the remains of large buildings, building foundations, demolition debris, and a parking lot. An abandoned railroad and the former steam plant building are on the western and southern portion of the property.

A site location map and site map are included as figures 1 & 2, respectively.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal 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 acquired the site in 1994. The site is currently unoccupied.

3.2: Environmental Restoration History

An environmental site assessment was conducted by Alpha Earth, Inc. in 1995. This site assessment identified environmental hazards including asbestos containing materials (ACM) in the buildings, lead-based

paints, electrical transformers containing PCB oil, and several drums of corrosive chemicals. Interviews with former employees documented that chemicals and dyes were stored at the site, and that they were discharged directly to the Creek after use.

SECTION 4: SITE CONTAMINATION

To determine the nature and extent of any contamination by hazardous substances of this environmental restoration site, the City of Amsterdam has recently completed a Site Investigation/Remedial Action Report (SI/RAR).

4.1: Summary of the Site Investigation

The purpose of the SI was to define the nature and extent of any contamination resulting from previous activities at the site. The SI was conducted in two phases. The first phase was conducted from November 1998 to May 1999. The second phase was conducted in August 2000, after the completion of the USEPA removal action at the former steam plant, as discussed in Section 4.2. A report entitled Final Site Investigation Report, dated November 2000, has been prepared which describes the field activities and findings of the SI in detail.

The SI included the following activities:

- Installation of soil borings and monitoring wells for analysis of soils and groundwater as well as physical properties of soil and hydrogeologic conditions;
- Surficial soil samples were collected to assess the potential for direct contact with contaminants;
- Test pits were excavated to look for buried transformers and obtain subsurface soil samples;
- Water and sediment samples were collected from the North Chuctanunda Creek, from upstream to the confluence with the Mohawk River; and
- An asbestos and lead paint survey was conducted.

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the SI analytical data was compared to environmental Standards, Criteria, and Guidance values (SCGs). Groundwater, drinking water and surface water SCGs identified for the former Mohasco Mill site are based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. For soils, NYSDEC TAGM 4046 provides soil cleanup guidelines for the protection of groundwater, background conditions and health-based exposure scenarios. Guidance values for evaluating contamination in sediments are provided by the NYSDEC Technical Guidance for Screening Contaminated Sediments.

Based on the Site Investigation results in comparison to the SCGs and potential public health and environmental exposure routes, certain areas and media of the site require remediation. These are summarized below.

More complete information can be found in the SI Report.

Chemical concentrations are reported in parts per billion (ppb) or parts per million (ppm). For comparison purposes, where applicable, SCGs are provided for each medium.

4.1.1 Nature of Contamination:

As described in the SI Report, many soil, groundwater and sediment samples were collected at the Site to characterize the nature and extent of contamination. The contaminants detected at this site were semi-volatile organic compounds (SVOCs), metals, polychorinated biphyenols (PCBs), and pesticides. The PCB contamination was remediated by an interim remedial measure discussed in Section 4.2. The SVOCs detected at the site are compounds referred to as polycyclic aromatic hydrocarbons (PAHs), and are a byproduct of combustion.

Sources of PAHs include power plants, automobile emissions and industrial processes. There are also natural sources of PAHs such as forest fires, volcanic eruptions, and decaying organic matter. Low concentrations of PAH compounds can be found in soil worldwide. The relatively high concentrations of PAHs and certain metals found at the Former Mohasco Mill site are likely the result of the fires which occurred at the site as well as the ash and soot from the former coal burning steam power plant.

4.1.2 Extent of Contamination

Table 1 summarizes the extent of contamination for the contaminants of concern in groundwater, soil, and stream sediments, and compares the data with the SCGs. The following are the media which were investigated and a summary of the findings of the investigation.

Soil

PAH compounds and metals were detected in surface soil samples at concentrations above guidance values in the vicinity of the former steam plant, with the highest concentrations detected at sample number SS-5 which is located under the former railroad trestle.

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 subsurface soil samples collected from the area south of Building 11 (test pits TP-5, TP-6, and TP-7). The highest concentration of total SVOCs detected in a sample in this area was approximately 400 ppm. Although the SCG for soil, for total SVOCs is 500 ppm, the concentrations of individual compounds such as benzo[a]anthracene and benzo[a]pyrene exceeded the SCG by more than two orders of magnitude. The concentrations of the metals barium, copper, and zinc exceeded the SCG by at least one order of magnitude in the samples collected from this area.

Samples collected from test pits in the drain lines in the floor of Building 7, the former dye house, had high levels of the pesticides aldrin and dieldrin in addition to elevated concentrations of metals.

Sediments

In stream sediment samples collected immediately downstream of the site, concentrations of the PAHs anthracene benzo[a]anthracene, phenanthrene, 2-methylnathalene, pyrene, napthalene, acenaphthene, fluorene, and fluoranthene exceeded the Technical Guidance for Screening Contaminated Sediments chronic toxicity level (sample SD-2). Screening of sediment samples as part of the ecological risk assessment indicates that a risk could exist for aquatic life in the North Chuctanunda Creek from the presence of PAHs, arsenic, lead, and zinc.

Groundwater

Groundwater in the vicinity of the main building complex has not been adversely impacted based on the results of the samples collected. Contaminants were detected at low levels in a few locations, but no plume of groundwater contamination was identified.

Monitoring well MW-14, located next to the former stream plant where the PCB transformers had been removed did show a concentration of PCBs (0.8ppb), compared to a groundwater standard of 0.09 ppb. Trichloroethene was also detected in MW-12 (13 ppb), which is located at the toe-of-slope in the southern portion of the property, and downgradient of off-site properties which may be acting as potential sources. MW-13, which is also located in the southern portion of the site, also exhibited low levels of PAHs (183 ppb of total PAHs). A buried creosote soaked railroad tie was encountered while drilling the boring for this well. This was the location of the former railroad trestle.

Surface Water

The only surface water on site is the North Chucktanunda Creek, which is a rapidly flowing large Class C stream. Any contaminants which may have been disposed in the stream while the mill was operating or during the fires has long since washed downstream. Since the groundwater in the vicinity of the main building complex has not been impacted from the site, and contaminates that were detected in soils (PAHs and metals) do not readily dissolve in water, the water in the North Chucktanunda Creek was only sampled for pesticides and PCBs.

PISCES samplers, sampling devices that are used to detect the presence pesticides and PCBs in flowing water, were placed in the stream for a 21 day period in the fall of 1998. The results showed non-detect to trace levels of PCBs (<20-42 parts per trillion), with no increase in concentrations downstream of the site area. This data indicates that the site does not adversely impact water quality in the creek.

4.2 Interim Remedial Measures:

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

During the Site Investigation, NYSDEC staff discovered abandoned electrical transformers leaking PCB oil and a large amount of friable asbestos at the former steam power plant. Upon making this discovery, the NYSDEC requested an emergency remedial response

action from the United States Environmental Protection Agency (USEPA). The USEPA responded, and from October 1999 through March 2000, an extensive IRM was undertaken in and around the former steam plant portion of the site by the. This IRM included:

- removal and proper disposal of PCB transformers;
- removal and proper disposal of asbestos containing materials;
- removal and proper disposal of coal and fly ash; and
- removal and proper disposal of approximately 195 tons of PCB contaminated soil.

A second IRM was conducted at the former steam plant in August, 2000. This IRM involved the removal and proper disposal of a 100,000 gallon above ground storage tank containing approximately 6,500 gallons of oil and sludge, and the removal and proper disposal of approximately 100 tons of petroleum contaminated soil.

Sampling performed after the completion of these IRMs indicates that they were successful in removing PCB and hydrocarbon contaminants above SCG levels.

4.3 Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the health risks can be found in Section 6 of the SI Report.

An exposure pathway is 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.

Pathways which are known to or may exist at the site include:

- ingestion of PAH compounds and heavy metals from direct contact with surface soils;

- ingestion of lead from lead based paint chips by trespassers in the remaining unremediated abandon buildings; and

- inhalation of asbestos fibers by trespassers in the remaining unremediated abandoned buildings.

In addition, the site is currently very accessible to trespassers and although the former steam plant building has been secured, numerous physical hazards still exist on site.

4.4 Summary of Environmental Exposure Pathways:

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

wildlife resources. The following potential pathways for environmental exposure have been identified:

- ingestion by benthic organisms of PAHs and metals in sediments of the North Chucktanunda Creek immediately downstream of the site

Since the North Chuctanunda Creek has classifications and standards of C, game fish are not a consideration in this stream.

SECTION 5: ENFORCEMENT STATUS

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

The PRPs are subject to legal actions by the State for recovery of all response costs the State has incurred. The City of Amsterdam will assist the State in its efforts to recover state funds by providing all information to the State which identifies PRPs. The City will also not enter into any agreement regarding response costs without the approval of the NYSDEC.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS AND FUTURE USE OF THE SITE

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. The overall remedial goal is to meet all 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 substance disposed at the site through the proper application of scientific and engineering principles.

The proposed future use for the Former Mohasco Mill Complex would be a park/business office complex. The goals selected for this site are:

- Reduce and control, to the extent practicable, the contamination present within the soils on site.
- Reduce the threat to benthic organisms in the North Chucktanunda Creek by eliminating any future contaminated surface run-off from the contaminated soils on site.
- Eliminate the potential for direct human or animal contact with the contaminated soils on site.
- Reduce the threat from physical hazards that exist on site.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy should be protective of human health and the environment, be cost effective and comply with other statutory requirements. Potential remedial alternatives for the Former Mohasco Mill Complex site were identified, screened and evaluated in a Remedial Alternatives Report. This evaluation is presented in the report entitled Remedial Alternatives Report, dated January, 2001 (RAR).

A summary of the detailed analysis follows. As presented below, the time to implement reflects only the time required to implement the remedy, and does not include the time required to design the remedy or procure contracts for design and construction.

7.1: Description of Alternatives

The potential remedies are intended to address the contaminated soils, asbestos, lead paint, and physical hazards at the site.

Alternative 1
No Further Action with Deed Restrictions

Present Worth:	$ 38,000
Capital Cost:	$38,000
Annual O&M:	$ 0
Time to Implement	3 months

This alternative recognizes remediation of the site conducted under previously completed IRMs. The monitoring wells would be properly plugged and abandoned. Deed restrictions would be placed on the property limiting the property to recreational, commercial, or industrial uses. Deed restrictions will also prevent the use of groundwater at the site and require appropriate action (excavation and proper disposal) should intrusive activities disturb contaminated soils.

This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2
Limited Soil Removal with Off-Site Disposal and Deed Restrictions

Present Worth:	$ 5,317,200
Capital Costs - Environmental Remediation:	$ 3,717,000
Building Demolition with offsite disposal:	$ 1,600,200
Annual O&M:	$ 0
Time to Implement	6 months - 1 year

The limited soil removal alternative would involve the removal of shallow soil "hotspots" from the site with off-site disposal at an approved landfill location. The excavated areas would be reseeded and grass established to reduce surface erosion. The building foundations of buildings 7, 7A, 11, and 26 would be demolished to gain access to the soil removal areas and for worker safety. The asbestos in buildings 20 and 20A would be properly removed and disposed at an off-site facility. Buildings 20 and 20A, and the smoke stack at the former steam power plant would be demolished and disposed off offsite. The deed restrictions described in Alternative 1 would also be included with this alternative.

Alternative 3
Soil Cover with On-site Building Demolition and Deed Restrictions

Present Worth:	$ 2,590,000
Capital Costs - Environmental Remediation:	$ 1,060,860
Building Demolition with onsite disposal:	$1,444,950

Annual O&M:	$ 5,000
Time to Implement	6 months - 1 year

The soil cover with building demolition and deed restrictions alternative would involve the placement of a soil cover over surface soils with contaminants that exceed site background, preventing erosion, and preventing direct exposure to any contaminated surface soils. Debris near the steam plant and the Building 31 foundation would be removed. The asbestos in buildings 20 and 20A would be properly removed and disposed at an off-site facility. Buildings 20 and 20A would then be demolished, along with building foundations of buildings 7, 7A, 11, and 26. The smoke stack at the former steam power plant would also be demolished. The demolished building material would be crushed and compacted for use as fill on site, covering the area of contaminated soils and the foundations of buildings 7, 7A, 11, and 26. This area, and the area around the former steam plant would then be covered with a geotextile and two feet of soil. The soil covered areas would be seeded and grass established. As with alternative 2, the deed restrictions described in Alternative 1 would also be included with this alternative.

7.2 Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of environmental restoration project sites in New York State (6 NYCCR Part 375). For each of the criteria, a brief description is provided followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is included in the Remedial Alternatives Report.

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

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance. SCGs for this site include NYS Groundwater Standards for Groundwater, TAGM 4046 for soil, and Technical Guidance for Screening Contaminated Sediments, dated March 1998, for sediments.

Alternative 1 would not provide for the compliance with SCGs. SCGs may be met through natural attenuation over a very long term, perhaps 100 years or more. Alternative 2 would meet SCGs for soil within the "hotspot" areas that would be excavated and removed. Alternative 3 would achieve SCGs for soil through containment.

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

The deed restrictions included in Alternative 1 would limit the intrusiveness of future activity that could occur, limit future uses, and notify potential purchasers that contamination is present. A potential direct human exposure pathway would exist from potential exposure to contaminants in surface soils. In addition, surface water runoff could

continue to leach contaminants in surface soils to stream sediments. Alternative 2 could reduce the mass of soil contamination by removal and off site disposal. Potential human exposure to contaminants in surface soil would be reduced. Potential human exposure to contaminants in surface soil would occur to a limited extent during the removal action, but would be controlled through the implementation of health and safety controls. Deed restrictions in Alternative 3 would control the intrusiveness of future activity. Direct exposure to contaminated surface soils and the erosion of these soils would be eliminated due to the presence of the soil cover.

Although the sediment sample at SD-2, collected immediately downstream of the former power plant buildings 25, 25A, and 25B, showed a total PAH concentration of over 32 ppm, none of the alternatives include removal of stream sediment in the North Chuctanunda Creek. The reason for this is that the substrate in the creek where it traverses the site is primarily bedrock, large cobble, and coarse grained material. Consequently, very little sediment is present in the streambed below the dammed section of the stream, and any impacts from contaminated sediments in the flowing portion of the creek would be minimal. In addition, sediment samples further downstream did not have levels of PAHs above sediment guidance criteria, except for benzo(a)anthracene, which exceeded SCGs in all four samples.

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

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

The implementation of Alternative 1 would have a negligible short term impact upon the community and environment. Standard procedures for the containment of environmental media would be employed during the excavation of soils with Alternative 2. A perimeter monitoring program would be developed to monitor for potential airborne contaminants which could be released during excavation and removal of soils. Alternative 2 could potentially expose site workers to site contaminants during excavation. Therefore, a site health and safety plan would be developed to alert workers to, and protect workers from any potential health risks associated with the excavation of contaminated soils.

With the implementation of Alternative 3, site workers could potentially come in contact with site contaminants in surface soils during material grading and the soil cover placement. Therefore, standard procedures for worker protection, including a site health and safety plan, would be established. Alternative 3 would also include perimeter air monitoring. A more extensive perimeter monitoring program would be developed to monitor for potential airborne contaminants which could be released during the demolition of buildings 20 and 20A included in Alternative 3. Alternatives 2 and 3 would both result in a short term increase in truck

traffic from the removal of soil or from bringing clean soil on site.

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

All three alternatives result in some contaminants remaining in groundwater, subsurface soils, and sediments. With Alternative 1, natural attenuation would likely reduce the magnitude of contamination. Deed restrictions would be the only control to limit risk, and the reliability of deed restrictions would depend on the ability to ensure adherence to the restrictions. Alternative 2 would reduce the magnitude of soil contamination by removal from the site. Alternative 3 relies on natural attenuation to reduce the magnitude of contamination in soils and reliably limit risk by covering contaminated soils on site combined with deed restrictions.

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

Alternative 1 would not reduce the toxicity or volume of contaminants in the soil. However, natural attenuation would likely reduce the toxicity of contaminants over time. Alternative 2 would reduce the volume and mass of contaminants by physically removing contaminated soil. Alternative 2 would have no effect on the toxicity of the contaminants since they would be transported and disposed of off-site. The soil cover in Alternative 3 would reduce the mobility of contaminants in surface soils.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc.. Alternatives 1, 2, and 3 are implementable using locally available resources. The City of Amsterdam Department of Public Works would not have the necessary equipment or personnel to implement the alternatives, therefore bids would be solicited from qualified contractors in accordance with General Municipal Law to accomplish the work.

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

This final criterion is considered a modifying criterion and is taken into account after evaluating those above. It is

evaluated after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - Concerns of the community regarding the SI/RAR reports and the Proposed Remedial Action Plan are evaluated. A "Responsiveness Summary" will be prepared that describes public comments received and how the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PROPOSED REMEDY

Based upon the results of the SI/RAR, and the evaluation presented in Section 7, the NYSDEC is proposing Alternative 3 as the remedy for this site (Figure 3).

Although all three alternatives are implementable, and Alternative 1 has the lowest cost, Alternative 1 is not proposed for the site because it would not reduce the potential for exposure to contaminants and would limit future uses. The proposed future use for portions of this site include a green space area. The potential for direct human exposure to PAHs and elevated metals in surface soils currently exists. In addition, erosion of contaminated surface soils could continue to contaminate stream sediments.

Although Alternative 2 would remove contaminants from the site, it is the most costly alternative, and it would not reduce toxicity of the contaminants since they would be transported and disposed of off-site.

Alternative 3 is proposed because it effectively protects human health and the environment. The soil cover would prevent direct exposure to PAHs and elevated metals in surface soils, as well as prevent the continued erosion of contaminated soils into the North Chuctanunda Creek sediments. Debris along the stream bank would be removed, and the soils consolidated and regraded. Any sludge or soil in the drain lines in building 7 would be removed prior to demolition and transported off-site for proper disposal. The foundations of buildings 7, 7A, 11, and 26 would then be demolished, followed by asbestos removal and demolition of buildings 20 and 20A. The demolition debris from buildings 20 and 20A would be deposited and compacted at the location of the former buildings 7, 7A, 11, and 26. The smoke stack at the former steam power plant would also be demolished. A geotextile demarcation layer would be placed, and a two foot thick soil cover constructed. The soil covered areas would be seeded and grass established. The debris and physical hazards under the building 31 foundation would be removed. Deed restrictions would control excavation and restrict the use of groundwater.

Deed restrictions would prevent groundwater use on site, until it could be shown that concentrations of contaminants were at or below SCGs. SCGs for groundwater were only slightly exceeded in a few locations. Since the area is served by a public water supply, groundwater is not used for human consumption. Therefore, a human ingestion or exposure to these low levels of contaminants in the groundwater is not likely. Over time, these low levels of contaminants in the groundwater will

naturally attenuate, and concentrations should eventually reach SCG levels.

Although game fish are not a consideration in the stream, game fish are an important consideration further downstream in the Mohawk River. It is necessary to stop the leaching of contaminants into the creek to protect the ecosystem and benthic life in the stream, and to prevent possible future downstream impacts to game fish in the Mohawk River. This would be addressed by removing material with the highest concentrations of PAHs from the banks of the creek, and preventing erosion of surface soils containing PAHs and elevated concentrations of metals.

The estimated present worth cost to implement the remedy is $ 2,590,000. The environmental remediation cost to implement the remedy is estimated to be $ 1,060,860. The cost of building demolition with disposal onsite is estimated at $1,444,950, and the estimated average annual operation and maintenance cost for 30 years is $ 5,000.

The elements of the proposed remedy are as follows:

1. A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Any uncertainties identified during the SI/RAR would be resolved. The design of this alternative would include the collection of additional surface soil samples to more accurately identify the lateral extent of PAH surface soil contamination so that the amount of soils to be consolidated and covered can be minimized. Background levels for the site would be further determined during design. Areas of the site having PAH levels that do not exceed background would not require a protective cover.

2. Removal of debris along the stream bank, with consolidation and regrading of contaminated soils.

3. The site would be regraded and covered with a protective layer of 2 feet of clean soil over green spaces (i.e. areas not occupied by buildings, pavement or sidewalk). Beneath the 2 foot soil layer, a commercial grade filter fabric will be installed to serve as a demarcation layer and to prevent inadvertent contact with contaminated soils.

   The soil cover material will be sloped from any sidewalk areas around the site to the required 2 foot elevation, if necessary, so as to allow for gradual elevation rise. Any excavated material not used for regrading purposes would be shipped off site to an approved and permitted landfill.

   Acceptable alternative protective cover possibilities could be: sidewalks, parking lots, building footprints, or other acceptable strategies that provide a barrier to contact with the contaminated subsurface soils.

4. A deed restriction would be used to require owners to maintain the protective layer materials as provided for in this proposed plan and subsequent Record of Decision and to also prohibit the usage of groundwater. If development or excavation occurs on site, any subsurface soils below the protective layer that are excavated would have to be disposed off site at an approved and permitted landfill in accordance with NYSDEC regulations. A plan will be submitted and approval must be given before any development or excavation work proceeds.

   The deed restriction would require owners to annually certify to the NYSDEC that the remedy and protective cover have been maintained and that the conditions at the site are fully protective of public health and the environment in accordance with the proposed plan and subsequent Record of Decision. Deed restrictions would also limit the uses of the property to recreational, commercial, or industrial.

5. Removal of physical hazards, debris under the building 31 foundation, and pesticide contaminated sludge or soil in the drain lines in Building 7 with off-site disposal.

6. Demolition of the foundations of buildings 7, 7A, 11 & 26.

7. Asbestos abatement and demolition of buildings 20, 20A, and the smoke stack at the former steam power plant building.

8. Decommissioning of the monitoring wells.

The NYSDEC would provide oversight and require sampling during the site regrading and building demolition. If any hazardous materials are encountered during regrading or building demolition, they would be disposed off site at an approved and permitted landfill in accordance with NYSDEC regulations.

Table 1
Nature and Extent of Contamination

MEDIA	CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (VOCs, SVOCs & PCB/Pesticides in ppb, metals in ppm) ND = Non Detect	FREQUENCY of EXCEEDING SCGs	SCG*
Groundwater	Volatile Organic Compounds (VOCs)	Trichloroethylene	ND - 13	1 of 17	5
		Acetone	6.6-7.5	2 of 17	5
		2-Butanone	ND - 17	1 of 17	5
		Toluene	ND - 14	1 of 17	5
	Semivolatile Organic Compounds (SVOCs)	Naphthalene	ND - 71	1 of 17	5
		2-Methylnaphthalene	ND - 22	1 of 17	5
		Acenaphthene	ND - 25	1 of 17	5
		Dibenzofuran	ND - 12	1 of 17	5
		Fluorene	ND - 16	1 of 17	5
		Phenanthrene	ND - 24	1 of 17	5
		Carbazole	ND - 13	1 of 17	5
	PCB/Pesticides	Aroclor 1260	ND - 0.8	1 of 17	0.09
		Dieldrin	ND - 0.04	1 of 17	0.004
Surface Soils	Semivolatile Organic Compounds (SVOCs)	Benzo(a)anthracene	240 - 7,500	3 of 10	224
		Chrysene	2,900 - 8,900	2 of 10	2,508
		Benzo(b)fluoranthene	ND - 7,800	1 of 10	6,897
		Benzo(k)fluoranthene	ND - 8,900	1 of 10	6,897
		Benzo(a)pyrene	110 - 10,000	8 of 10	61
	Metals	Aluminum	7,490-10,800	3 of 10	6,170
		Arsenic	36.2-130	8 of 10	7.5
		Barium	ND - 363	1 of 10	300
		Beryllium	0.45-2.4	7 of 10	0.43

Table 1
Nature and Extent of Contamination
CONTINUED

MEDIA	CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (VOCs, SVOCs & PCB/Pesticides in ppb, metals in ppm) ND = Non Detect	FREQUENCY of EXCEEDING SCGs	SCG*
		Copper	28.3-106	6 of 10	25
		Iron	17,500-64,200	8 of 10	17,100
		Lead	15.2-272	0 of 10	500
		Mercury	0.24-25.9	6 of 10	0.1
		Nickel	14.7-41.4	5 of 10	13
		Zinc	49.6-1,590	10 of 10	48.1
	Pest. / PCBs	Aroclor - 1260	ND - 1,300	1 of 10	1,000
Subsurface Soils	SVOC's	Benzo(a)anthracene	300-28,300	6 of 14	224
		Chysene	14,200-27,900	4 of 14	2,508
		Benzo(b)fluoranthene	19,800-29,500	4 of 14	6,897
		Benzo(k)fluoranthene	10,600-26,400	4 of 14	6,897
		Benzo(a)pyrene	190-22,800	8 of 14	61
	Metals	Aluminum	5,400-12,000	5 of 14	5,170
		Barium	881-5,800	6 of 14	300
		Chromium	62.3-736	3 of 14	50
		Copper	36.6-8,680	11 of 14	25
		Iron	19,000-221,000	9 of 14	17,100
		Lead	8.8-957	3 of 14	500
		Magnesium	13,100-197,000	3of 14	10,100
		Manganese	259-1,030	7 of 14	253

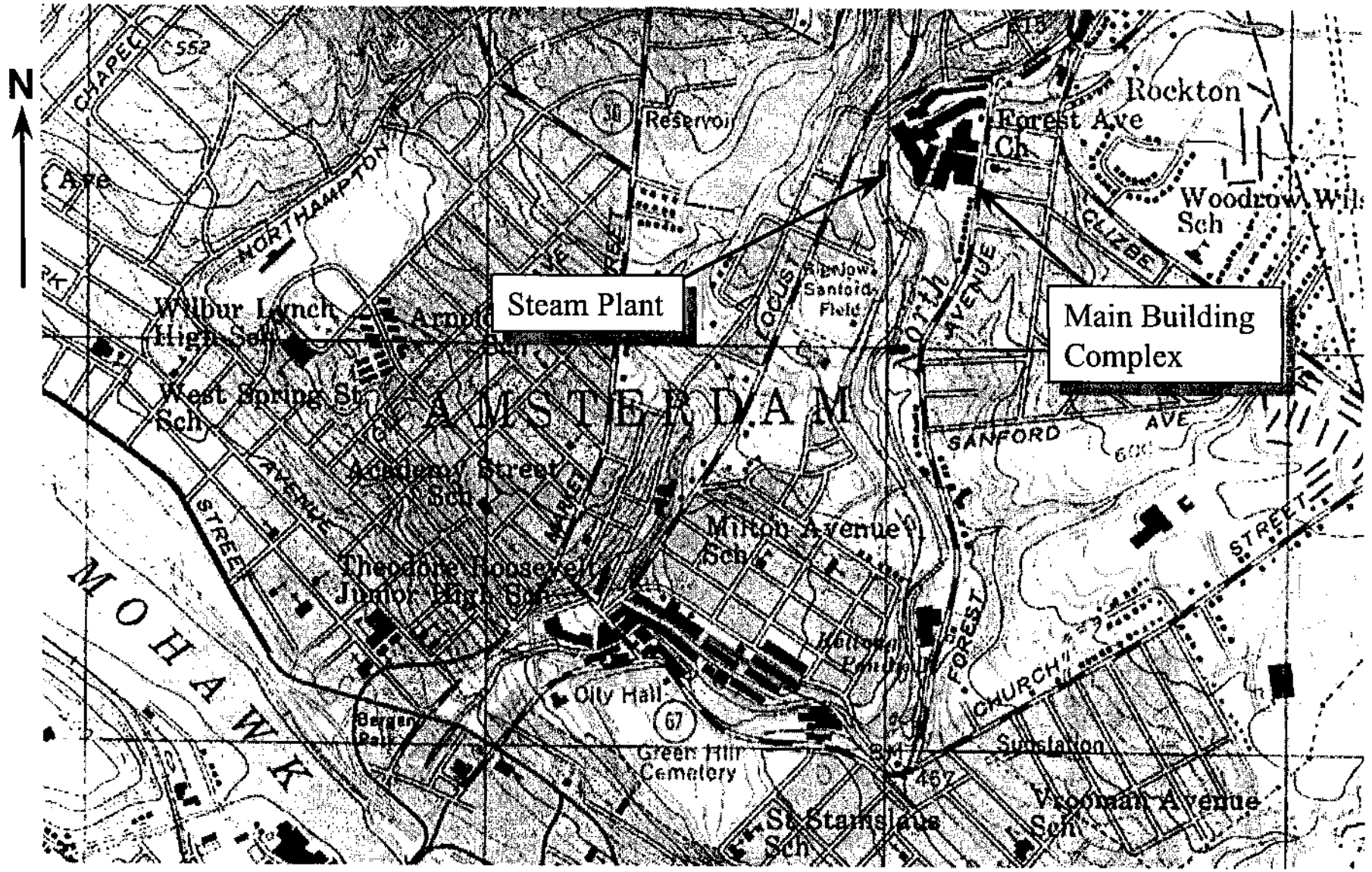
Table 1
Nature and Extent of Contamination
CONTINUED

MEDIA	CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (VOCs, SVOCs & PCB/Pesticides in ppb, metals in ppm) ND = Non Detect	FREQUENCY of EXCEEDING SCGs	SCG*
	Metals (continued)	Mercury	0.16-1.1	5 of 14	0.1
		Nickel	13.8-119	8 of 14	13
		Zinc	52.7-5,190	11 of 14	48.1
	Pesticides	Aldrin	65-2,200	2 of 14	41
		Dieldrin	180-32,000	6 of 14	44
Sediments	SVOCs	Naphthalene	ND - 110	1 of 4	30
		2 Methylnathalene	ND - 57	1 of 4	34
		Acenaphthene	ND - 330	1 of 4	140
		Fluorene	ND - 420	1 of 4	8
		Phenanthrene	470-4,700	2 of 4	120
		Anthracene	ND - 1,000	1 of 4	107
		Fluoranthene	ND - 5,600	1 of 4	1,020
		Pyrene	ND - 4,700	1 of 4	961
		Benzo(a)anthracene	53-2,400	4 of 4	12
	Metals	Arsenic	7.6-17.5	2 of 4	6
		Lead	46-286	3 of 4	31
		Zinc	ND - 137	1 of 4	120

* Standards, Criteria, and Guidance (SCGs) - The concentrations shown are in parts per billion for VOCs, SVOCs, and pesticides & PCBs; parts per million for metals. The SCGs include Part 703 NYS Groundwater Standards for groundwater; Soil Cleanup Levels (TAGM 4046); a subsurface soil sample from SB - MW-4 from 6-8ft. considered to be representative of background conditions; and NYSDFW Technical Guidance for Screening Contaminated Sediments, March, 1998, updated January 1999. The SCG for sediment shown is for Chronic Toxicity. The SCG for lead in soil was taken from TAGM 4646 as representative background in metropolitan areas.

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Costs	Annual O&M	Total Present Worth
No Further Action	$38,000	$0	$38,000
Limited Soil Removal with Off-Site Disposal and Deed Restrictions	Environmental Remediation: $ 3,717,000 Building Demolition with off-site disposal: $1,600,200	$0	$ 5,317,200
Soil Cover with Building Demolition with On-Site Disposal and Deed Restrictions	Environmental Remediation: $ 1,060,860 Building Demolition with on-site disposal: $1,444,950	$ 5,000	$ 2,590,000



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

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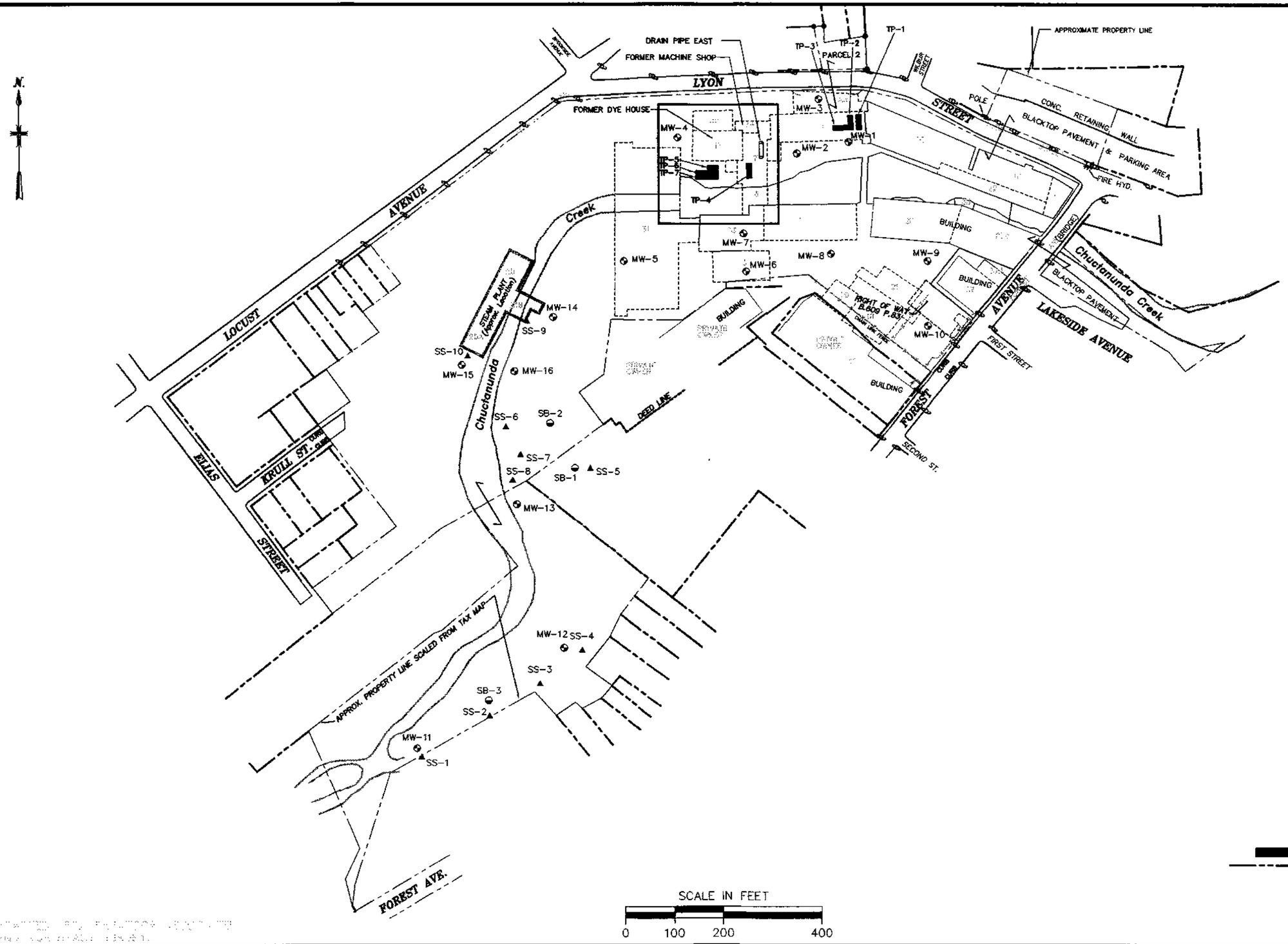
AMSTERDAM, NEW YORK

SITE LOCATION

FIGURE 1



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SAMPLE LOCATIONS

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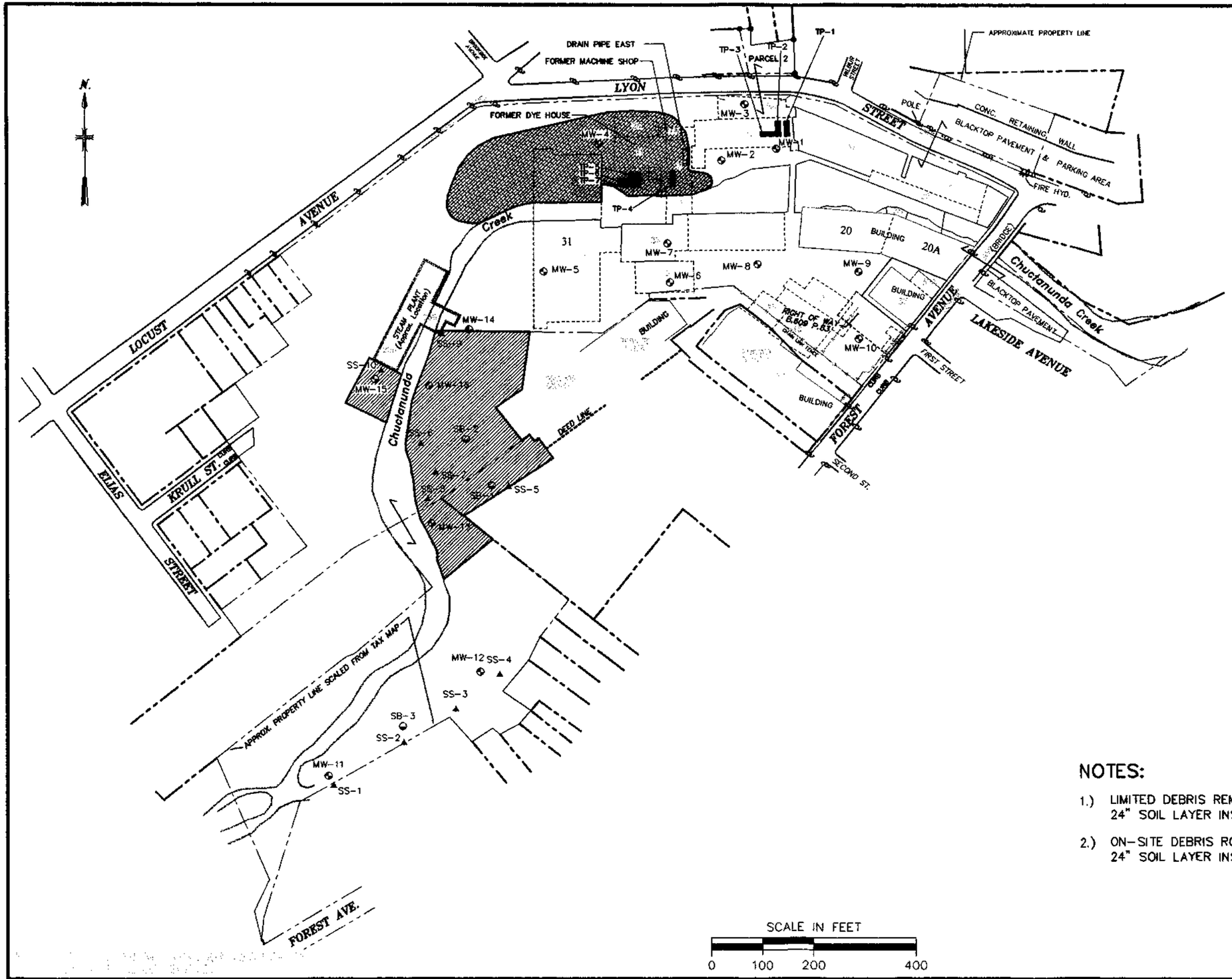
FIGURE 2



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.

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Alternative 3 - Soil Cover with Building Demolition

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FIGURE 3