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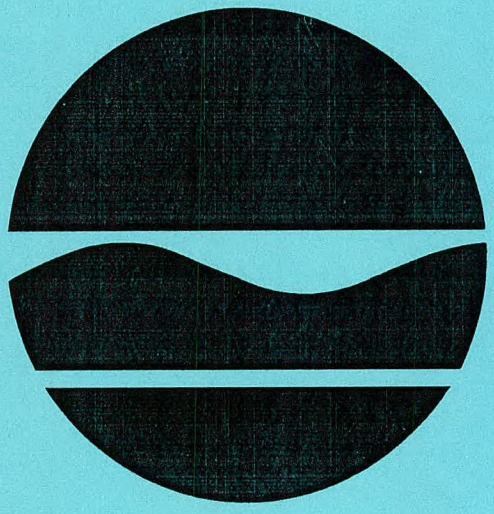
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SYRACUSE CHINA SITE

Salina (T), Onondaga County, New York
Site No. 7-34-053

PROPOSED REMEDIAL ACTION PLAN

February 1996



Prepared by:

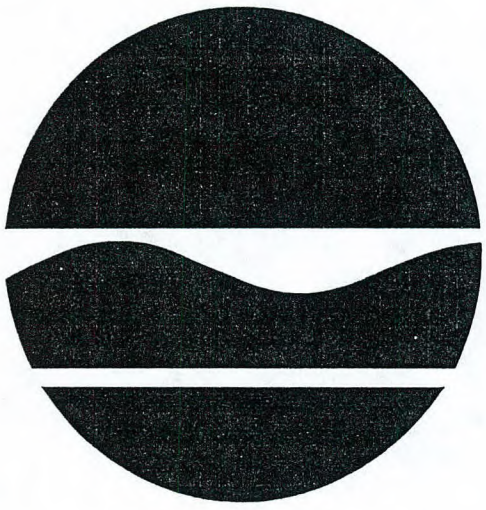
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation

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PROPOSED REMEDIAL ACTION PLAN

SYRACUSE CHINA SITE

Town of Salina, Onondaga County, New York
Site No. 7-34-053
February 1996

SECTION 1: PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) is proposing capping of the Syracuse China site landfill consistent with the requirements of Title 6 New York Codes, Rules and Regulations (6NYCRR) Part 360, installation of an upgradient groundwater interceptor trench and the excavation and consolidation of fill comprising the eastern portion of the landfill, contaminated treatment pond sludges, and contaminated sediments from the adjacent wetlands, under the cap. This remedy is proposed to address the threat to the environment created by the presence of lead and other heavy metals in the landfill, the settling ponds and the adjacent wetlands south of Factory Avenue.

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

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

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

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

The Salina Free Library
100 Belmont Street
Mattydale, New York 13211
(315)454-4524: (Call for hours)

NYSDEC
Division of Hazardous Waste Remediation
50 Wolf Road, Room 242
Albany, New York 12233-7010
Steven M. Scharf, P.E., Project Engineer
(518)457-4343: (Mon.-Fri., 8:00 am to 4:15 pm)

NYSDEC
615 Erie Boulevard West
Syracuse, New York 13204-2400
Sue Miller, Citizen Participation Specialist
(315)426-7403: (Mon.-Fri., 8:30 am to 4:45 pm)

Written comments on the PRAP can be submitted to Mr. Scharf at the above address.

DATES TO REMEMBER:

February 21, 1996 to March 22, 1996: Public comment period on RI/FS Report, PRAP, and preferred alternative.

February 28, 1996 at 7:00 p.m.: Public meeting at the Holiday Inn, Carrier Circle, Syracuse, New York.

SECTION 2: SITE LOCATION AND DESCRIPTION

The Syracuse China facility is located in an urban setting in the Town of Salina, Onondaga County, New York. The landfill, where a waste with hazardous waste characteristics was disposed, is located to the north of the manufacturing facility on Syracuse China Property. The landfill occupies an area of approximately 13 acres and is bounded by Conrail tracks on the south side, a NYSDEC regulated wetland (SYE 6), Factory Ave and Ley Creek on the north side and undeveloped Syracuse China property to the east and west. The Syracuse China Site is near the General Motors Corporation (GM) plant Site No. 7-34-057 and the Ley Creek PCB Dredgings Site I.D. No. 7-34-044 Inactive Hazardous Waste Sites.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The Syracuse China Site is defined as the industrial landfill, the settling ponds and the adjacent wetlands (See figure 2). The site has been used as an industrial landfill by Syracuse China since approximately 1940 and had open public access until the access roads to the property were fenced sometime in the late 1960's or early 1970's.

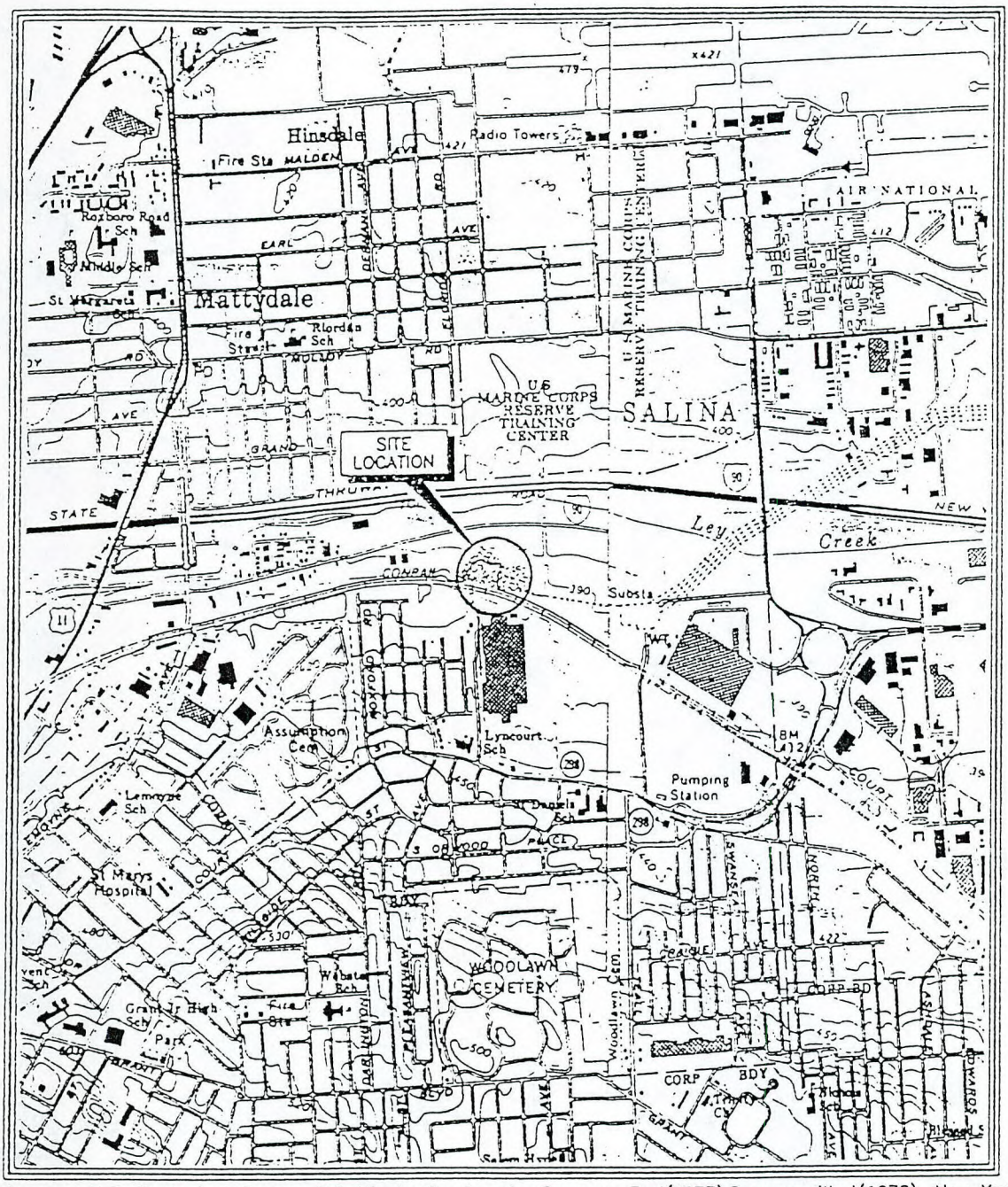
The landfill can be divided into two separate areas. The western half of the landfill is the oldest section and contains broken china, gypsum molds, facility wastewater sludge, refractory materials and other miscellaneous china manufacturing wastes. The eastern half contains solid waste piles, the settling ponds, various low lying areas of china manufacturing waste and some dried sludges from the settling ponds.

Current site topography is dominated by the two sections. The western half is much larger and higher than the eastern half of the landfill. The area of lower elevation of the eastern portion of the landfill is the location of the two primary and two secondary settling ponds which are part of the wastewater treatment settling pond system, operated by Syracuse China under a State Pollution Discharge Elimination System (SPDES) permit. The outfall of the settling ponds, which is the sampling point for the SPDES permit, discharges to the wetland.

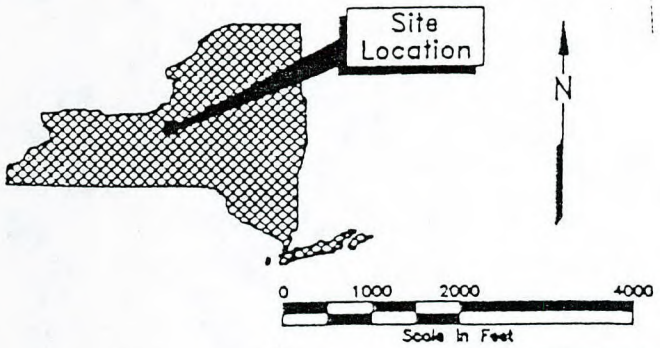
3.2: Remedial History

April 1990: Syracuse China agreed to conduct a groundwater quality study around the landfill in response to revised 6 NYCCR Part 360 regulations. A report, entitled "Preliminary Hydrogeologic Assessment Report" was prepared which detailed the results of investigations conducted to characterize the surface water and groundwater quality in the vicinity of the landfill, and also included sampling of wastewater sludges disposed adjacent to the settling ponds. The major problem identified was in the sludge samples, which were found to be characteristic hazardous wastes due to the failure for lead in the Extraction Procedure (EP) toxicity test. Some surface water samples also indicated the presence of lead above the calculated surface water guidance value.

March 1991: The Syracuse China Site was listed as a class 2 inactive hazardous waste site due to the presence of lead as a characteristic hazardous waste and the threat posed to the wetlands system. The lead was a constituent of the china glazing process wastes. Changes to the filtering process have since removed the lead and other inorganics from the wastewater stream.



Reference: U.S. Geological Survey, 7.5 Minute Quadrangle, Syracuse East(1977),Syracuse West(1978), New York



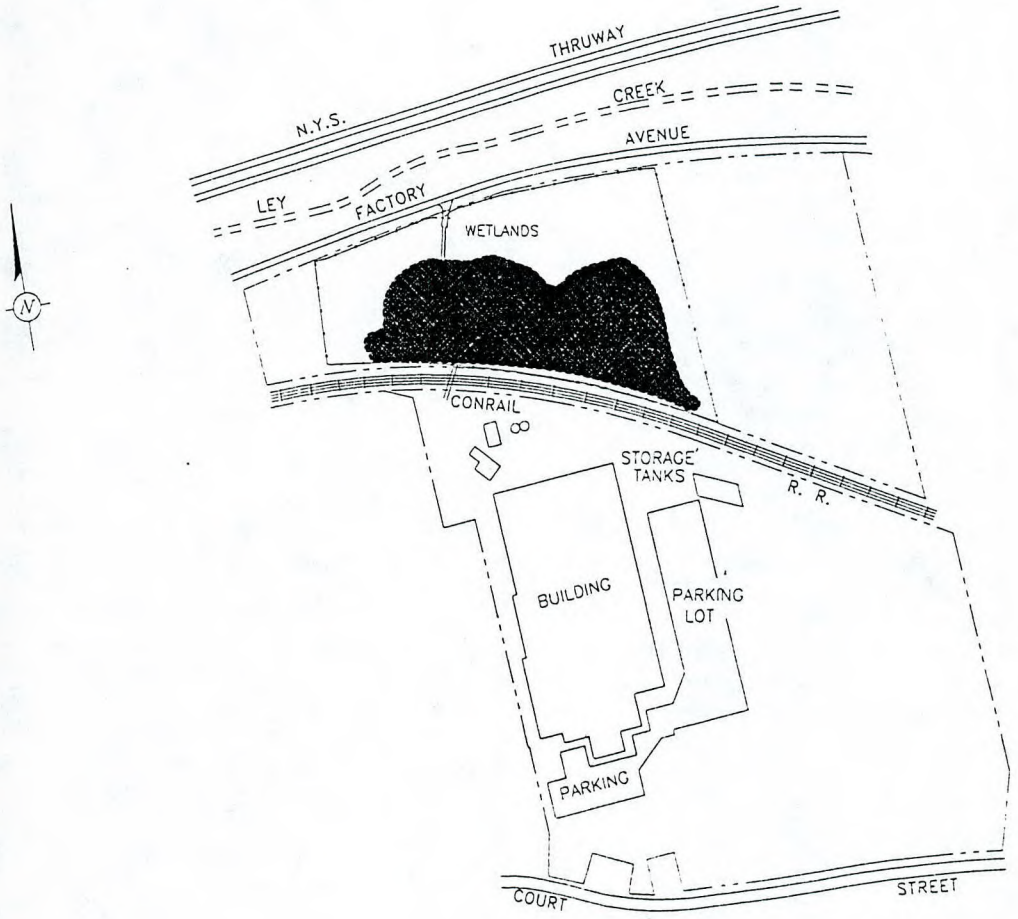
SYRACUSE CHINA LOCATION

DIVISION OF HAZARDOUS WASTE REMEDIATION

REVISED DATE: 2/21/96

DRAWING: FIGURE DRAWN FROM GERAGHTY AND MILLER IN. BASEMAP

FIGURE 1



LEGEND

SYRACUSE CHINA PROPERTY LINE

APPROXIMATE LIMITS OF FILL

0 400 800
Scale in feet

SYRACUSE CHINA SITE PLAN

DIVISION OF HAZARDOUS WASTE REMEDIATION

REVISED: DATE: 2/21/96

DRAWING: DRAWN FROM GERAGHTY AND MILLER INC. BASE MAP

MODIFIED BY:
STEVEN M. SCHARF, P.E.

FIGURE 2

October 1994: Syracuse China signs a consent order, Index No. A601408802, to develop and implement a Remedial Investigation/Feasibility Study (RI/FS) pursuant to Article 27, Title 13.

October 1995: Consent Order Index No C7-5125-94-08, was signed. This order resolved Syracuse China's alleged liability for penalties for alleged past violations of the air, water, wetlands, and hazardous and solid waste programs. The order defers to the Title 13 process for remediation of the landfill and wetlands.

SECTION 4: CURRENT STATUS

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

4.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted in 2 phases. The first phase was conducted between November 1994 and May 1995; the second phase during August, 1995. A report entitled Remedial Investigation Report, December 1995 has been prepared describing the field activities and findings of the RI in detail.

The two phases of the RI included the following activities:

- Magnetometer survey to determine whether buried drums exist in the landfill.
- Installation of soil borings and monitoring wells for analysis of soils and groundwater as well as physical properties of soil and hydrogeologic conditions.
- Excavation of test pits in the landfill to investigate anomalies identified in the magnetometer survey.
- Surface water and sediment samples in the adjacent regulated wetland.
- Wetlands delineation and ecological assessment.

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the RI analytical data was compared to environmental Standards, Criteria, and Guidance (SCGs). Groundwater, drinking water and surface water SCGs identified for the Syracuse China site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. NYSDEC TAGM 4046 soil cleanup guidelines for the protection of groundwater, background conditions, and risk-based remediation criteria were used as SCGs for soil. The NYSDEC Technical Guidance for Screening Contaminated Sediments is used for surface water sediments.

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

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

4.1.1 Nature of Contamination:

As described in the RI Report, many soil, groundwater, surface water and sediment samples were collected at the Site to characterize the nature and extent of contamination. The RI included sampling for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides and poly-chlorinated biphenyls (PCBs), cyanide based compounds and inorganics (metals). The primary contaminant of concern (COC) is lead, which is present at characteristic hazardous waste levels, and to a lesser extent the metals, iron, cadmium mercury arsenic, zinc, copper, chromium, silver and manganese. Lead is the COC which will define the areas requiring

remediation for the landfill, settling pond sludges, and wetland sediments and surface water. No significant concentrations of VOCs, SVOCs or PCBs were noted in the RI.

4.1.2 Extent of Contamination

Table 1 summarizes the extent of contamination for the contaminants of concern in the landfill, groundwater, wetland, sediment and surface water and compares the data with the proposed remedial action levels (SCGs) for the Site. The following are the media which were investigated and a summary of the findings of the investigation.

Landfill Waste

Soil borings were drilled into the landfill to characterize the fill material. From these borings twelve samples were analyzed for Extraction Procedure (E.P.) toxicity with nine of twelve reported concentrations ranging from 4.1 to 27 ppm for lead, with an average concentration of 17 ppm. The level of lead defining a sample as characteristic hazardous waste is 5 ppm.

Additional soil borings in the western half of the landfill revealed the fill thickness to range from 16-28 feet. Soil borings in the vicinity of the settling ponds on the eastern portion of the landfill indicated four feet of fill material.

The waste materials are generally both buried and exposed to the surface. In addition to representing potential health and environmental exposure, they also must be addressed as part of the solid waste corrective actions spelled out in the October 1995 Consent Decree.

Soils

Soil borings were also drilled into the landfill berms and for monitoring wells in areas outside the landfill. Soil samples were taken from each soil boring and analyzed for volatiles, semivolatiles, pesticides/ polychlorinated biphenyls (PCBs) and cyanide compounds. No significant levels of these compounds were detected. The soils were also analyzed for metals including iron, barium, copper, lead, magnesium, nickel and arsenic. Lead levels in soil ranged from 6.8 to 426 ppm at varying depths. The soil samples revealed that only a few iron, zinc and chromium results exceeded the NYSDEC TAGM Cleanup Criteria for soils.

Sediments

The sediments in the wetlands adjacent to the settling ponds, which discharged to the wetlands, were found to be highly contaminated with lead. This was expected since the pond sediments contain lead at a level that makes the pond sludge a characteristic hazardous waste due to failure of the EP toxicity test. Lead concentrations in the wetland ranged from 51.9 to 6010 ppm, with an average concentration in 15 samples of 3381ppm. Other metals were also present in some of the sediment samples and while they appear less frequently and at lower concentrations then lead, are present at elevated levels with respect to the sediment screening guidance. These other metals, mercury, zinc, silver, nickel, chromium, arsenic, copper, iron, manganese and chromium were identified coincident with the elevated lead, therefore lead will be considered the indicator of impacted sediments.

Groundwater

The analytical results for groundwater indicated low levels of several VOCs in the groundwater, and all but one were below the NYSDEC groundwater standard. One compound, xylene, was detected at 9 ppb which was; only slightly above the groundwater standard of 5 ppb. No pesticides, PCBs or cyanide compounds were detected in groundwater samples. This was not the case for lead, iron, magnesium, manganese, sodium, zinc, arsenic, copper and vanadium. Overall, the results show that groundwater is increasing in lead concentrations as it passes beneath and through the landfill material, with concentrations ranging from nondetect to 292 ppb. The groundwater standard for lead is 25 ppb.

Groundwater in Onondaga County is typically hard water which exhibits naturally occurring high concentrations of iron, manganese, sodium and magnesium due to the geologic composition of the

shale bedrock and glacial overburden material. The concentrations of these metals reported in the groundwater at this site are within the expected background ranges for Onondaga County, and are not considered to be attributable to the landfill.

Surface Water

The sample analytical results for metals identified lead and zinc above the NYSDEC surface water quality standards. The surface water standard for lead was calculated to be 6.4 ppb based on a combined water calcium and magnesium hardness of 200 ppm. The highest concentration of lead detected was 103 ppb detected near the SPDES outfall, with lead ranging from 22 to 103 ppb in the remaining samples. The low levels of VOCs found in the surface water, such as bromodichloromethane, are laboratory contaminants and not attributable to the site.

4.2 Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the health risks can be found in Section 7.0 entitled "Risk Assessment" of the RI 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.

Off-site exposure is expected to be low under current or future conditions. Lead was detected in surface water in the wetland area. Surface water from the wetland ultimately discharges to Ley Creek; however, minimal sediment transports from the wetland to Ley Creek is expected.

The wetland area and Ley creek are not expected to be routinely used for recreation or fishing. Although Ley Creek is a Class B stream, the fish and wildlife impact analysis report indicated this area did not support a substantial fish population and the area has limited access by the general public. Nevertheless, individuals fishing, wading or swimming in Ley Creek or the wetland area, could be exposed to lead.

Current and future exposures to on-site workers and off-site residents are not expected to pose an unacceptable risk based on the limited exposure potential and extent of release. Concentrations of VOCs detected in groundwater, surface water and sediment were below New York State standards and guidance values.

Lead and zinc were identified as contaminants of concern (COC) in samples collected from the wetland area adjacent to the site. Under current site conditions, on-site exposure is limited. Workers collecting samples from the settling pond outfall could potentially come in contact with landfill soil, surface water, sediment and soils. The limited exposures reasonably expected to occur under these conditions do not likely poses an unacceptable risk. Residents living near the site may use Ley Creek for fishing and swimming; however, the available data indicate that these activities are unlikely. Nevertheless, the USEPA Integrated Exposure Uptake BioKinetic (IEUBK) model was used to assess potential exposure to lead via fish ingestion. The results of the model indicated that lead in fish posed little risk to local populations even at relatively high dietary levels (5 to 10 percent of total meat diet).

4.3 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 RI presents a more detailed discussion of the potential impacts from the site to fish and wildlife resources.

The pathways for environmental exposure have been identified as the wetland sediments and surface water. The site sediments exceed the NYSDEC Sediment criteria for two categories the lowest observable effect level (LOEL) and the

severe effect level (SOEL) for lead, in most samples. Lead, cadmium, mercury, chromium, arsenic, iron, silver, copper and zinc exceeded the LOEL in some or most of the wetland sediments adjacent to the landfill. The inorganics, arsenic and copper exceeded the severe effect level for some of the sediment samples taken at the site.

SECTION 5: ENFORCEMENT STATUS

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

The NYSDEC and the Syracuse China Manufacturing Company entered into a Consent Order on October 20, 1994. The Order obligates Syracuse China (the Potentially Responsible Party) to implement a Remedial Investigation/ Feasibility Study for the site. Upon issuance of the Record of Decision (ROD) the NYSDEC will approach the PRPs to implement the selected remedy under an Order on Consent.

The following is the chronological enforcement history of this site.

	Orders on Consent	
Date	Index	Subject
10/20/94	A601408802	RI/FS
10/11/95	C7-5125-94-08	Part 360,etc.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

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

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

The goals selected for this site are:

- Reduce, control, or eliminate to the extent practicable any significant threat to the environment resulting from the contamination present within the soils/waste on site and/or potential generation of leachate within the fill mass.
- Eliminate the threat to the environment posed by the contaminated sediments within the adjacent wetland.
- Eliminate the threat to surface waters by eliminating any future contaminated surface run-off from the contaminated soils, sediments and wastewater sludges on site.
- Eliminate the potential for direct human or animal contact with the solid wastes, contaminated soils, sediments and wastewater sludges on site.
- Mitigate the potential impacts of contaminated groundwater to the environment.
- Prevent, to the extent possible, migration of contaminants in the landfill to groundwater.
- Provide for attainment of SCGs for groundwater quality at the limits of the area of concern (AOC), to the extent practicable.

Table 1
Nature and Extent of Contamination

MEDIA	CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE	FREQUENCY of EXCEEDING SCGs	SCG
Groundwater	Inorganics	Lead	ND - 292 ppb	22 of 24	25 ppb
		Copper	ND - 356	3 out of 16	200
		Cadmium	ND - 3	0 out of 16	10
		Chromium	ND - 132	8 out of 16	50
		Silver	ND - 2.5	0 out of 16	50
		Arsenic	ND - 49	6 out of 16	25
		Zinc	ND - 419	3 out of 16	300
		Mercury	ND - 20	1 out of 16	2
Surface Water	Inorganics	Lead	22 - 103 ppb	4 out of 14	6.4[a] ppb
		Copper	ND - 16	0 out of 14	21.3
		Cadmium	ND	0 out of 14	2.0
		Chromium	ND - 4.3	0 out of 14	11
		Silver	ND - 2.7	0 out of 14	50
		Arsenic	ND - 1	0 out of 14	50
		Zinc	13 - 70	0 out of 14	148
		Mercury	ND - 16	1 out of 14	2
Soils	Inorganics	Lead	2.3 - 426 ppm	1 out of 9	500 ppm
		Copper	ND - 16.9	0 out of 9	25
		Cadmium	ND	0 out of 9	10
		Chromium	3.3 - 11.1	3 out of 9	50
		Silver	ND	0 out of 9	SB
		Arsenic	1 - 5.9	0 out of 9	7.5
		Zinc	14.7 - 256	8 out of 9	20
		Mercury	ND	0 out of 9	.1

[a] Based on hardness of water
SB - Soil background

Table 1 (cont.)
Nature and Extent of Contamination

MEDIA	CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE	FREQUENCY of EXCEEDING SEL	SEL (ppb)
E.P. Toxicity	Inorganics	Lead	ND - 27 ppm	9 of 12	5
Sediments	Inorganics	Lead	51.9 - 6010 ppm	15 out of 16	31\110[b]
		Copper	3.4 - 154	1 out of 14	16\110[b]
		Cadmium	ND - 3.7	0 out of 14	0.6\9[b]
		Chromium	3.2 - 32.1	0 out of 14	26\110[b]
		Silver	ND - 31.8	5 out of 14	1.0\2.2[b]
		Arsenic	ND - 64.1	3 out of 14	6\33[b]
		Zinc	57 - 796	1 out of 14	270[b]
		Mercury	ND - 1.1	0 out of 14	.15\1.3[b]

[b] Severe Effect Level\Lowest Effect Level from the Technical Guidance for Screening Contaminated Sediments

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy should be protective of human health and the environment, be cost effective, comply with other statutory laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Syracuse China Site were identified, screened and evaluated in a Feasibility Study. This evaluation is presented in the report entitled "Focused Feasibility Study, Syracuse China Landfill."

A summary of the detailed analysis follows. As used in the following text, the time to implement reflects only the time required to implement the remedy, and does not include the time required to design the remedy, procure contracts for design and construction or to negotiate with responsible parties for implementation of the remedy.

7.1: Description of Alternatives

The potential remedies are intended to address the contaminated soils, sediments, surface water and groundwater at the site. This Site was determined to represent a typical industrial landfill, therefore the presumptive remedy approach was considered appropriate for the FS. This determination is reflected in the alternatives presented below.

Alternative 1: No Action

Present Worth:	$ 316,430
Capital Cost:	$ 000
Annual O&M:	$ 25,500
Time to Implement	None

The no action alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an unremediated state. This alternative would leave the

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

Alternative 2: Limited Action.

Present Worth:	$385,225
Capital Cost:	$75,000
Annual O&M:	$ 25,000
Time to Implement	3 months

This alternative would provide limited action at the site involving institutional controls to restrict human exposure to the contaminants of concern . This alternative would restrict access to the public and any activities at the site, other than environmental monitoring. The access would be restricted by extending the present site fence all the way around the landfill area.

Alternative 3A: Excavation, Relocation Covering with Soil Cap and Leaving Wetland Soil for Natural Attenuation

Present Worth:	$ 1,171,634.
Capital Cost:	$ 849,000
Annual O&M:	$ 26,000
Time to Implement	6 months - 1 year

This alternative would involve excavating and relocating sludge from the settling ponds and fill from the eastern portion of the landfill to the area to be capped, with dewatering of the sludge as necessary. Approximately 1.3 acres of the wetland area, shown on Figure 3, would be included in the material excavated in order to restore this area to the wetland elevations prior to landfilling. The contaminated wetlands sediments would be left in place.

The western landfill area and relocated material would be capped. The cap would not be consistent with Part 360, and would in general consist of gas collection as appropriate, a 24 inch thick soil cover and a 6 inch topsoil layer. All surface runoff from the site would be directed towards the adjacent wetlands. Long term operation, maintenance and monitoring would be implemented to insure the effectiveness of the remedy.

Alternative 3B: Excavation, Relocation, Covering with Geomembrane Cap, and Leaving Wetland Soil for Natural Attenuation

Present Worth:	$ 1,479,634
Capital Cost:	$ 1,157,000
Annual O&M:	$ 26,000
Time to Implement	6 months - 1 year

The components of alternative 3B would be the same as those for alternative 3A, except that a geomembrane would be added as the low permeability barrier layer, of the cap, which would be designed in accordance with the applicable requirements of 6 NYCCR Part 360.

Alternative 4A: Excavation, On-Site Treatment, Relocation and Covering with a Soil Cap

Present Worth:	$ 2,453,634
Capital Cost:	$ 2,131,000
Annual O&M:	$ 26,000
Time to Implement	6 months - 1 year

This alternative, in addition to the excavation and relocation under the cap of the same material described in Alternative 3A, would also include the area of wetland sediments identified in Figure 3. The wetland would be allowed to revegetate naturally, subject to the need to stabilize the soils through reseeding. In addition to dewatering of these materials as necessary for landfilling, this alternative would also include treatment of the excavated sludges using stabilization and/or solidification. The landfill cap would also be the same as alternative 3A. All surface runoff would be directed towards the adjacent wetlands. Long term operation, maintenance and monitoring would be implemented to insure the effectiveness of the remedy.

Alternative 4B: Excavation, On-Site Treatment, Relocation and Covering with a Geomembrane Cap

Present Worth:	$ 2,762,634
Capital Cost:	$ 2,244,000
Annual O&M:	$ 26,000
Time to Implement	6 months - 1 year

The components of alternative 4B would be the same as those of 4A, except that a geomembrane would be added

as the low permeability barrier layer, of the cap, which would be designed in accordance with the applicable requirements of 6 NYCCR Part 360.

Alternative 5A: Excavation, Relocation and Covering with a Soil Cap

Present Worth:	$ 1,241,634
Capital Cost:	$ 919,000
Annual O&M:	$ 26,000
Time to Implement	6 months - 1 year

Alternative 5A would be the same as Alternative 4A except that the excavated sludges and wetland sediments would be placed on the landfill without any treatment except for dewatering. Capping would prevent exposure to and leaching of the metals which are the contaminants of concern in the sludge and wetland sediments. Therefore, disposal without treatment would be protective of human health and the environment and would meet regulatory requirements since the material would be handled within the same area of contamination.

Alternative 5B: Excavation, Relocation and Covering with a Geomembrane Cap

Present Worth:	$ 1,549,634
Capital Cost:	$ 1,227,000
Annual O&M:	$ 26,000
Time to Implement	6 months - 1 year

The components of alternative 5B would be the same as those of 5A, except that a geomembrane would be added as the low permeability barrier layer, of the cap, which would be designed in accordance with the applicable requirements of 6 NYCCR Part 360.

Alternative 6A: Installation of an Interceptor Trench, Excavation, On-Site Treatment, Relocation and Covering with a Soil Cap

Present Worth:	$ 2,558,634
Capital Cost:	$ 2,236,000
Annual O&M:	$ 26,000
Time to Implement	6 months - 1 year

Alternative 6A would be the same as Alternative 4A, with the addition of an upgradient groundwater interceptor trench designed to intercept groundwater flow from the south into the landfill and depress the groundwater level below the fill. All surface runoff and the discharge from the collection trench would be directed to the adjacent wetland. The approximate extent of the interception trench is shown on Figure 4.

Alternative 6B: Installation of an Interceptor Trench, Excavation, On-Site Treatment, Relocation and Covering with a Geomembrane Cap

Present Worth:	$ 2,867,634
Capital Cost:	$ 2,545,000
Annual O&M:	$ 26,000
Time to Implement	6 months - 1 year

The components of alternative 6B would be the same as those of 6A, except that a geomembrane would be added as the low permeability barrier layer, of the cap, which would be designed in accordance with the applicable requirements of 6 NYCCR Part 360.

Alternative 7A: Installation of an Interceptor Trench, Excavation, Relocation and Covering with a Soil Cap.

Present Worth:	$ 1,346,634
Capital Cost:	$1,024,000
Annual O&M:	$ 26,000
Time to Implement	6 months - 1 year

The components of Alternative 7A would be similar to Alternative 6A with the exception of the treatment of the excavated sludges prior to placement under the landfill cap. No treatment of this material would be required for Alternative 7A, as discussed in Alternative 5A.

Alternative 7B: Installation of an Interceptor trench, Excavation, Relocation and Covering with a Geomembrane Cap

Present Worth:	$ 1,654,634
Capital Cost:	$ 1,332,000
Annual O&M:	$ 26,000
Time to Implement	6 months - 1 year

The components of alternative 7B would be the same as alternative 7A, except that a geomembrane would be added as the low permeability barrier layer, of the cap, which would be designed in accordance with the applicable requirements of 6 NYCCR Part 360.

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 inactive hazardous waste sites in New York State (6NYCRR Part 375). For each of the criteria, a brief description is provided followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is contained in the Feasibility Study.

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

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

The most significant SCGs for this site would be 6 NYCRR Part 360 (Solid Waste Management Facilities), 6 NYCRR Parts 700-705 (Groundwater Standards) and the NYSDEC DFW sediment criteria. Alternatives 1, 2, and 3A and 3B would not meet SCGs for either some or all of these SCG's. Alternatives 3B, 4B, 5B, 6B and 7B would meet the requirement for landfill closure set forth in Part 360, however, the A series of these alternatives would not unless a variance to the low permeability barrier requirement were to be granted.

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

Alternative 1 would not provide any additional protection to human health, however no existing and only potential future exposures have been identified. The remaining alternatives would be protective of human health.

Alternatives 1, 2, 3A and 3B would also not address the contaminated sediments in the adjacent wetland and therefore would not be as protective of the environment as would those alternative that remove the sediments. Alternatives 4A, 4B, 5 A and 5B while addressing the sediments, would not prevent continued contamination of the groundwater from contact with the landfill waste. Alternatives 6A, 6B, 7A and 7B would protect groundwater as well, although by stabilizing the consolidated waste some increased assurance would be gained by Alternatives 6A/B, which would be the most protective of the environment.

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.

Alternatives 1 and 2 would have no short term impacts since no intrusive work would be required. Alternatives 3A/B, 4/B, 5A/B, 6A/B and 7A/B would all have similar short term impacts associated with the excavation of fill material and the treatment pond sludges which would require adequate health and safety measures to insure protection of the community, the workers and the environment from any particulates or other releases generated during the excavation. All of these alternatives, with the exception of 3A/B, would also present short term impacts during excavation of the contaminated wetland sediments, however this is negligible in terms of the benefit derived. Alternatives 4A/B and 5A/B would not include upgradient groundwater interception, which would lessen the short term impacts of the remedies since they would not include trenching adjacent to the Conrail Tracks. Short term impacts would also be greater, due to worker and public exposure potentials, as a result to the additional handling required to provide treatment for Alternatives 4S/B and 6A/B.

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.

Alternatives 1 and 2 would have no long-term effectiveness nor permanence since no substantive remediation would occur. Each of the other alternatives

3A/B, 4A/B, 5A/B, 6A/B and 7A/B would result in wastes and or treated residual remaining on site, however the magnitude of the remaining wastes would be minimized by consolidation of fill and contaminated materials, and proper closure of the landfill. The B series of these alternative would include an impermeable geomembrane and would thus have greater effectiveness in minimizing leachate generation and groundwater protection. Alternatives 4A/B and 5A/B would not include groundwater interception and therefore would also have lower long term effectiveness and permanence with respect to continued contaminant loading to the groundwater. Alternatives 6B and 7B would not include treatment of lead contaminated sludge, as would 6A and 7A, and so would be somewhat less effective. However, once the site is capped and the groundwater is lowered, so that there is no longer contact with the fill material, further degradation of downgradient groundwater would not be expected. All four alternatives, 4B 5B, 6B and 7B, would have a higher degree of permanence with respect to the landfill closure, as compared to the A series due to the geomembrane include in the cap. Each of the 4-7 alternatives would result in significant long term benefit to the environment since they would remove the contaminated sediments from the wetland.

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

Alternatives 1 and 2 would not reduce toxicity, mobility or volume (TMV) of contaminants in the landfill or the wetland. All of the capping and consolidation alternatives would reduce the mobility of the contaminants from the landfill, with the B series to a greater degree due to the impermeable membrane. Alternatives 3A/B would not address the TMV of the wetland sediments, however the remaining alternatives would all remove the sediments resulting in a reduction in TMV relative to the wetland. A reduction in toxicity in terms of exposure and mobility of the contaminants of concern in the consolidated sludge and fill materials would be realized for Alternatives 3-7 since they would be placed under a low permeability cover in each alternative. Alternatives 4B and 6B, both of which would include stabilization of sludge materials before placement under the cap, would also reduce the mobility of the lead in the sludge. Alternatives 4A/B and 5A/B would not include groundwater interception, therefore would not reduce the TMV of inorganic contamination in the groundwater, to as high a degree as Alternatives 6A/B and 7A/B would.

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.

Alternative 1 would require no implementation and Alternative 2 would only require a limited amount of fencing. Alternatives 3 A/B, 4A/B, 5A/B, 6A/B and 7A/B would all be readily implementable requiring no unique construction techniques for the consolidation and capping aspects of the work. Alternatives 6A/B and 7A/B would be somewhat more difficult to implement since they would include the groundwater interceptor trench and Alternatives 3A/B also would not require the excavation of the wetlands which would make implementation easier than 4-7 as well. Alternatives 4A/B and 6A/B would also be slightly more difficult to implement with respect to the stabilization required for the settling pond materials. None of the alternatives would face any significant administrative requirements which would limit their implementability.

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

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

8. Community Acceptance - Concerns of the community regarding the RI/FS 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 final remedy selected differs

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual O&M	Total Present Worth
Alternative 1	$ 0	$ 25,500	$ 316,430
Alternative 2	75,000	25,000	385,225
Alternative 3A	849,000	25,000	1,171,634
Alternative 3B	1,157,000	26,000	1,479,634
Alternative 4A	2,131,000	26,000	2,453,634
Alternative 4B	2,440,000	26,000	2,762,634
Alternative 5A	919,000	26,000	1,241,634
Alternative 5B	1,227,000	26,000	1,549,634
Alternative 6A	2,236,000	26,000	2,558,634
Alternative 6B	2,545,000	26,000	2,867,634
Alternative 7A	1,024,000	26,000	1,346,634
Alternative 7B	1,332,000	26,000	1,654,634

significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PREFERRED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC is proposing **Alternative 7B: Installation of an Interceptor Trench, Excavation, Relocation, and Covering with a Geomembrane Cap**, as the remedy for this site.
This selection is based upon the analysis of the eleven remedial alternatives for the Syracuse China Site. Alternative 7B would provide the best balance of the evaluation criteria and would satisfy NYSDEC Standards, Criteria and Guidance, of particular importance, closure of the landfill consistent with 6 NYCRR Part 360.

Alternative 7B would be protective of human health and the environment by ensuring that the current impacts to groundwater and wetlands sediments and surface water would be addressed.

This alternative would have a high degree of short term effectiveness, and would provide high long term effectiveness and implementable at a moderate cost, compared to 6B, while addressing the groundwater contact with the fill material. Even though this alternative would not directly reduce the toxicity and volume of contaminated materials, it would reduce their mobility in the general environment and would also reduce the toxicity and volume of lead in the groundwater and the wetlands and would address the risks associated with the site.

The estimated present worth cost to implement the remedy would be $1,654,634. The cost to construct the remedy is estimated to be $1,332,000 and the estimated average annual operation and maintenance cost for 30 years would be $26,000.

The elements of the selected remedy would be as follows:

1. A remedial design program to verify the components of the conceptual design and to provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Any uncertainties identified during the RI/FS would be resolved.

2. Excavation and consolidation of the contaminated settling pond sludges onto the western portion of the landfill in the area to be capped.

3. Excavation and consolidation under the cap of approximately 1.3 acres of the landfill to restore the Class 1 wetland to the original area prior to encroachment by landfilling. This would resolve existing Article 24 violations. The approximate area which would be excavated is shown on Figure 3.

4. Excavation and consolidation under the cap of additional landfill materials which are beyond the cap boundary in the eastern portion of the landfill.

5. Excavation and consolidation under the cap, of the contaminated wetland sediments in the approximately 6 acre area shown on Figure 3. This area and the depth of contamination would be further defined during the pre-design phase of the project. This definition would be based upon consideration of, but not limited, to data generated from the evaluation of topographic elevations, toxicity testing , plant uptake studies and/or a refinement of the ecological risk assessment included in the Feasibility Study. In areas where contaminated sediments exceed the estimated 1-2 foot depth, covering of the lead contaminated sediments with sufficient clean soil to mitigate exposure could be considered instead of excavation.

   The wetland would be allowed to revegetate naturally, subject to the need to stabilize the soils through reseeding. The swale north of Factory Avenue will be covered and/or lined as part of the Ley Creek PCB Dredgings Site Remedial Program. All wetlands work will require approval from the U.S. Army Corps of Engineers and comply with NYSDEC Article 24 requirements.

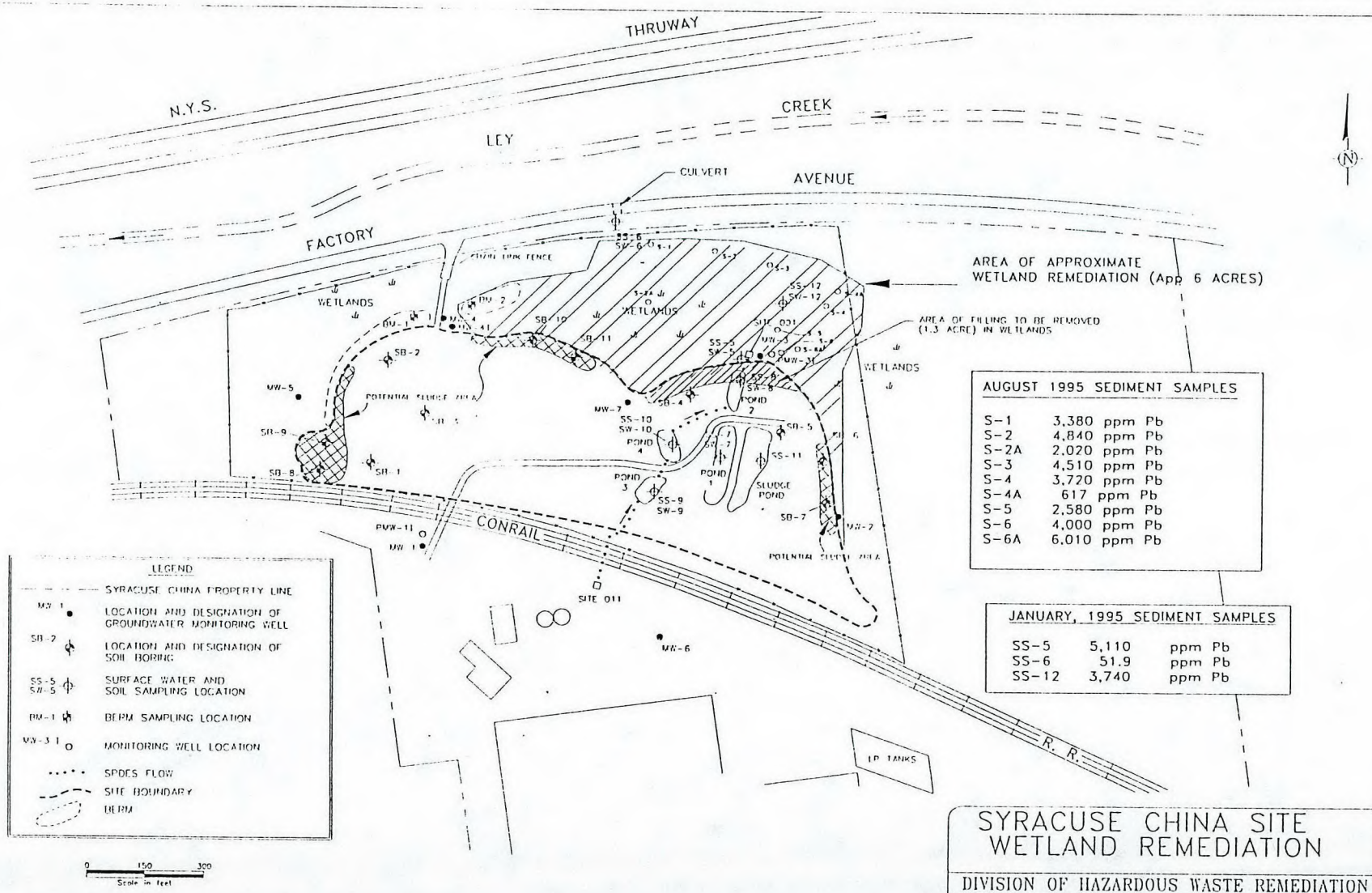
6. Dewatering of the sludge and wetland sediments, as required to meet regulatory requirements for placement of material in the landfill.

7. Installation of an upgradient groundwater cutoff system, which would be designed to intercept groundwater passing through the fill and lower the water table below the fill, to prevent leaching of lead into the groundwater. Discharge from the trench would be directed to the wetland. The approximate location of this trench is shown on Figure 4.

8. Capping of the landfill consistent with the applicable requirements of 6 NYCRR Part 360, which would include but not be limited to: (1) installation of a 40 mil geomembrane cap; (2) installation of surface drainage; (3) minimum slopes of 4 percent and maximum of 33 percent slopes: (4) performance of an explosive gas survey and hydrogen sulfide generation survey and if necessary design of a landfill gas collection system based upon these results; (5) long term maintenance and monitoring. The cap would be designed so that no encroachment on the wetland area would result.

9. Reconstruction of the settling ponds, as necessary to maintain the current wastewater discharge. SPDES permit compliance would be maintained during the remediation.

10. Since the remedy would result in untreated hazardous waste remaining at the site, a long term monitoring program would be instituted. This program would allow the effectiveness of the selected remedy to be monitored and would be a component of the operation and maintenance for the site.



SYRACUSE CHINA SITE WETLAND REMEDIATION

DIVISION OF HAZARDOUS WASTE REMEDIATION

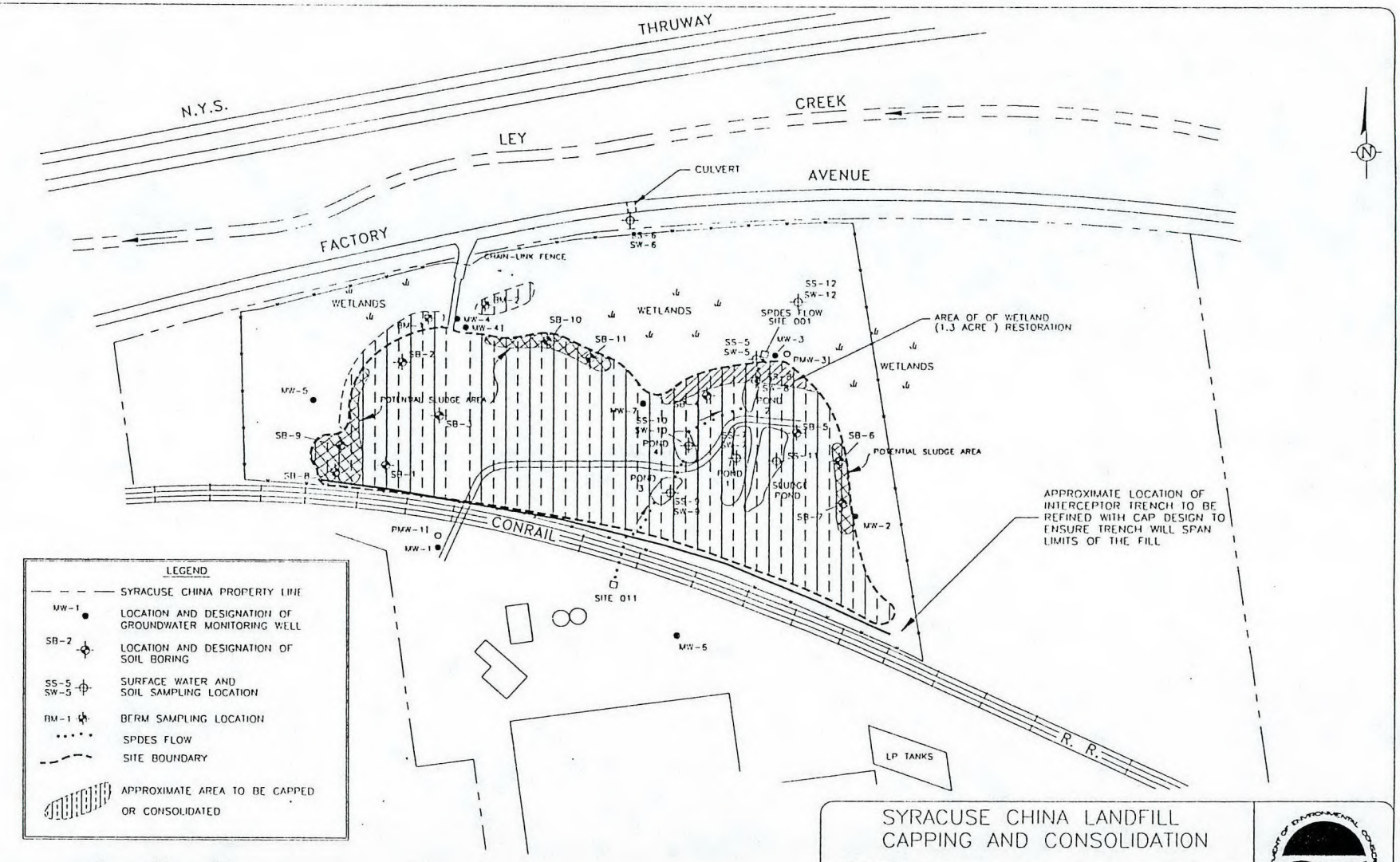
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SITE No. 7-34-053

FIGURE 3



SYRACUSE CHINA LANDFILL
CAPPING AND CONSOLIDATION

DIVISION OF HAZARDOUS WASTE REMEDIATION

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FIGURE 4