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McKESSON ENVIROSYSTEMS
Inactive Hazardous Waste Site
Operable Unit No. 1

Syracuse (C), Onondaga County, New York
Site No. 07-34-020

RECORD OF DECISION

March 1994

Prepared by:

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

DECLARATION STATEMENT - RECORD OF DECISION

McKesson Envirosystems Inactive Hazardous Waste Site
Operable Unit No. 1 - Unsaturated Soils
Syracuse, Onondaga County, New York
Site No. 7-34-020

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the McKesson Envirosystems Inactive Hazardous Waste Disposal Site, Operable Unit No. 1, which was chosen in accordance with the New York State Environmental Conservation Law (ECL). The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the McKesson Envirosystems Inactive Hazardous Waste Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

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

Description of Selected Remedy

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) for the McKesson Envirosystems site and the criteria identified for evaluation of alternatives, the NYSDEC has selected Biological Treatment Using In-Situ Soil Blending as the remedy for Operable Unit No. 1, the Unsaturated Soils. The components of the remedy are as follows:

o 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. Uncertainties identified during the RI/FS would be resolved.

o In-situ bioremediation of all areas of the site where the contaminants of concern are greater than 5 ppm.

- Attainment of technology-based cleanup levels and performance of bioremediation for a minimum 60 days as measured by a performance standard to be developed during the design phase of remediation and accepted by the Department. Should technology-based levels not be achieved in 60 days bioremediation would continue to a minimum 90 days duration and continue thereafter until the cleanup levels are achieved.

- Final contouring with a minimum of 12 inches of clean soil, grading and seeding of the site to promote surface water runoff and limit the infiltration of rain and surface water into the remediated areas.

- Installation of additional monitoring well(s) to supplement the existing site perimeter groundwater monitoring network.

- Conducting a program of groundwater sampling and analysis to verify that contamination has not migrated off the site.

New York State Department of Health Acceptance

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

Declaration

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

March 18, 1994
Date

Ann Hill DeBarbieri
Ann Hill DeBarbieri
Deputy Commissioner

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SECTION 1: SITE LOCATION AND DESCRIPTION

The McKesson Envirosystems (Inland Site) is located in the city of Syracuse to the south of Onondaga Lake. The site is approximately 8.2 acres in size and is separated by Van Rensselaer Street into two parcels (Figure 1). The parcel north of Van Rensselaer Street is within 150 feet of the New York State Barge Canal Terminal channel, most of which is well-vegetated with grasses, shrubs, and some trees. The largest of the former aboveground storage tanks (Tank 7) was located on this portion of the site.

The bulk of previous material storage and handling took place in the area south of Van Rensselaer Street, where ten former aboveground storage tanks were located. A paved parking area and buildings account for approximately ten percent of this southern parcel. The remainder supports vegetation consisting of weeds, grasses and the primary vegetation on the south parcel, wetland-associated species. The wetland plants are confined to areas near the locations of the former aboveground storage areas. Berms surround the site as well as the former tank areas, resulting in standing water which is present within the berms for significant periods of time. However, no NYSDEC-designated wetlands are located on site. These berms preclude surface water runoff to the Barge Canal, as evidenced by the standing water within the berms. The site is also within one-quarter mile of Onondaga Lake, which is a major surface water body in the greater Syracuse area.

Land use in the surrounding area may be characterized as industrial/light industrial, being on the edge of the "Oil City" area of Syracuse, although there are current plans for significant non-industrial development in this area. The McKesson property also has an industrial zoning classification.
The former storage areas of the site are secured against trespass with chain link fence and barbed wire. A soil berm is also present along most of the site perimeter, and berms surround the former tank areas.

Operable Unit No. 1, which is the subject of this Record of Decision (ROD), consists of the unsaturated soils at the site.

An Operable Unit represents a discrete portion of the remedy for a site which for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release or exposure pathway resulting from the contamination present at a site. The remaining operable unit for this site will address the saturated soils and the groundwater, which will be the second operable unit at this site. Any remediation necessary to address this remaining contamination will be the subject of a future ROD.

SECTION 2: SITE HISTORY

2.1: Operational/Disposal History

1920's: Occupied by various salt companies.

1928-1969: Petroleum Storage Facility (ARCO), Tanks 1-6 (South Parcel)

1951: Tank 7 installed (North Parcel)

1969- 1973: Petroleum Storage Facility BP Oil Company (BP)

1973: Inland Chemical Corporation (ICC) purchases site from BP Oil Company for storage of waste streams including: methanol, methylene chloride and other solvents destined for recycling at other ICC facilities..

1982: ICC operations discontinued.

2.2: Remedial History

1980: ICC filed a Part A Permit Application for Interim status as a hazardous waste storage facility under the Resource Conservation Recovery Act (RCRA).

1987: Revised part A application for closure submitted to NYSDEC. Remediation Consent Order signed 6/10/87.

1988: McKesson Corporation submitted a RCRA closure plan entitled "Verification of Aboveground Storage Tank Decontamination Protocol" to NYSDEC.

1989: RCRA Closure certification submitted to NYSDEC Aboveground tanks removed from the site.

1990: Notification from NYSDEC that facility was officially closed and that corrective actions would proceed under the Remediation Consent Order which was amended to include both McKesson Corporation and Safety-Kleen Environsystems Company as Respondents.

The Final Remedial Investigation Report was issued in April 1990. A PAH Distribution Report was issued at the same time.

1992: A residential Risk Assessment and FS Screening of Alternatives were completed.

1993: A Soil Bioremediation Pilot study was conducted at the site using both in-situ and ex-situ techniques. A Feasibility Study and results of the Pilot Study were completed.

SECTION 3: CURRENT STATUS

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

3.1: Summary of the Remedial Investigation

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

The RI was conducted in 1988 and 1989. A report entitled *Final Remedial Investigation Report, April 1990,* has been prepared describing the field activities and findings of the RI in detail. A summary of the RI follows:

The RI activities consisted of the following:

- Installation of 136 soil borings
- 13 piezometer clusters
- 22 monitoring wells and related groundwater sampling
- 159 soil samples

The analytical data obtained from the RI was compared to environmental Standards, Criteria, and Guidance (SCGs). Groundwater, drinking water and surface water SCGs identified for the McKesson Corporation site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. Soil and sediment analytical results where evaluated against NYSDEC soil cleanup guidelines for the protection of groundwater, background conditions, and risk-based remediation criteria were evaluated in order to develop remediation goals for soil.

Soil cleanup values were obtained by evaluating the technology based limits of bioremediation and evaluating these limits during an on-site treatability study. The site specific conditions were taken into account during this evaluation, in particular the nature of the groundwater.

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 findings are summarized below. More complete information can be found in the RI Report.

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

Soils

The unsaturated soils to be addressed by this operable unit at this site are those approximately four feet in depth which lie above the groundwater elevation, which corresponds to an elevation of 365 feet. Unsaturated soils above 365 feet will be addressed by the remedy, unless field conditions support that a greater depth (i.e. lower elevation) would be appropriate. These soils have been contaminated with materials previously stored in tanks at the site. The following 14 chemicals have been observed at the site during the RI: benzene, toluene, ethylbenzene, xylenes, tetrachloroethene, trichloroethene, trans-1,2-dichloroethene, methylene chloride, vinyl chloride, aniline, N,N-dimethylaniline, acetone, methanol, and chlorobenzene and represent the Chemicals of Concern (COCs). For evaluation purposes, the Chemicals of Concern were grouped into four classes based on similar chemical characteristics and are identified

TABLE 1

MCKESSON CORPORATION
BEAR STREET FACILITY

CHEMICALS OF CONCERN
MAXIMUM CONCENTRATIONS OBSERVED
IN SOILS[1] AND GROUND WATER[2]

	Ground-Water Concen. (mg/l)	Monitoring Well Location	Soils Concen. (mg/kg)[3]	Soil Boring Location
Non-Halogenated Aromatics				
Benzene	1.8	MW-2	11.5	B83
Toluene	0.025	MW-9	17.	B83
Ethylbenzene	0.36	MW-2	49.	B83
Xylenes	0.81	MW-2	218.	B83
Chlorinated Aliphatics				
Tetrachloroethene	ND	---	0.34	B63
Trichloroethene	0.1	MW-3	140.	B135*
t-1,2-dichloroethene	1.8	MW-3	0.22	B92
Methylene Chloride	2800.	MW-8	827.	B135*
Vinyl Chloride	0.45	MW-3	ND	---
Dimethylaniline-Related Compounds				
Aniline	8.5	MW-8	282.	B137*
N,N-dimethylaniline	52.	MW-8	1,830.	B139*
Other				
Acetone	470.	MW-8	833.	B132*
Methanol	300.	MW-8	13,072.	B139*
Chlorobenzene	0.001	MW-5	4.2	B63

Notes:

ND = Not Detected.
[1] = Soil samples collected December 1988 and October 1989.
[2] = Ground-water samples collected November 1989.
[3] = Soil concentration units are dry weight basis.
* = Soil borings installed in October 1989 after tank removal.

as follows in the text: non-halogenated aromatics, chlorinated aliphatics, dimethylaniline-related compounds, and "other chemicals" which do not fit into the three stated classes. The specific compounds in each class are listed on Table 1.

Non-halogenated aromatics (benzene, toluene, ethylbenzene, and xylenes) are frequently detected in association with petroleum products (primarily gasoline). Chlorinated aliphatic compounds are commonly used as solvents. They include the following compounds detected at this site: tetrachloroethene (TeCE), trichloroethene (TCE), trans-1,2-dichloroethene (t-1,2-DCE), methylene chloride, and vinyl chloride. The dimethylaniline-related compounds observed at the site are aniline and N,N-dimethylaniline. Acetone, methanol, and chlorobenzene are "other chemicals" present at the site which do not fit into the other classes of chemicals.

In general, the chemicals of concern were detected near the former materials loading area and the former locations of the aboveground storage tanks. Maximum observed soils concentrations of the chemicals of concern and the borings from which the samples were taken are presented in Table 1.

Non-Halogenated Aromatics: The maximum observed concentrations of each of the BTEX compounds in soils above the water table were observed in soil boring B-83. This soil boring is located within 100 feet of the former main tanker truck materials loading area. These concentrations were: 11.5 ppm benzene, 17 ppm toluene, 49 ppm ethylbenzene, and 218 ppm xylenes. These concentrations were detected 2.5 to 3.5 feet below the surface in soil boring 83. Lower concentrations were detected at a more shallow depth (1.5 to 2.5 feet) in the same soil boring.

Chlorinated Aliphatics: The maximum observed concentrations of two of the four chlorinated aliphatics were detected in soil boring B-135, which was installed in November 1989 at the former location of Tank 1. Trichloroethene and methylene chloride were detected at 140 ppm and 827 ppm, respectively, in this boring at a depth of 2.5 to 3.5 feet. The maximum soils concentration of TeCE (0.34 ppm) was observed in soil boring B-63 which is located at the eastern perimeter of Tank 5. This concentration was detected at a depth of 1.5 to 2.5 feet. Trans-1,2-DCE was detected at a maximum concentration of 0.22 ppm in soil boring B-92. This soil boring is located in the area immediately adjacent to the former location of Tank 1. Vinyl chloride was not detected in any soil samples from the site.

Dimethylaniline-Related Compounds: The highest concentrations of aniline and N,N-dimethylaniline detected in soils were observed at former aboveground storage tank locations. Aniline was detected at 282 ppm in soil boring B-137 from the former Tank 4 area. N,N-dimethylaniline was detected at 1,830 ppm in soil boring B-139 from the former Tank 2 area. Both of these samples were obtained at a depth of 0.5 to 1.5 feet.

Other Compounds: Maximum observed concentrations of acetone and methanol were detected in soil samples collected at former aboveground storage tank locations. Acetone was found at a concentration of 833 ppm in soil boring B-132 in the area where Tank 3 was formerly located. Methanol was found at a concentration of 13,072 ppm in soil boring B-139 in the area where Tank 2 was formerly located. The maximum concentration of chlorobenzene (4.2 ppm) was detected in soil boring B-63 which is located at the perimeter of the area where Tank 5 was formerly located.

Groundwater

The stratigraphy beneath the site consists of four soil units having different hydraulic conductivities. The hydraulic conductivities range from the low hydraulic conductivity of the upper silt and clay soil unit and lower confining unit to moderate to high hydraulic conductivity of the middle and lower soil units. The low hydraulic conductivity of the upper silt and clay soil unit limits the amount of surface water infiltration from precipitation and snow melt runoff; which contributes to ponding water in the former tank impoundment areas. The silt and clay confining unit has a low hydraulic conductivity, and would act as a barrier to groundwater movement between the materials above the confining unit to those materials below the confining unit.

The three flow systems identified beneath the Bear Street site are: a deep flow system in the unconsolidated deposits beneath the confining layer, an intermediate flow system in the lower soil unit, and a shallow flow system in the upper and middle soil units. The intermediate flow system, in the lower soil unit, can be separated into a freshwater zone and saltwater zone. It is reported that groundwater in this zone is and has historically been unusable as a potable source due to its high chloride concentrations. Both the shallow and intermediate flow systems are influenced by seasonal or transient conditions including precipitation, ponding water and subsequent infiltration within the impoundments, and the water elevation of the Barge Canal. The discharge point for the shallow and intermediate flow systems is the Barge Canal, and the discharge point for the deep flow system appears to be Onondaga Lake.

The groundwater quality results indicate the presence of chemical compounds at concentrations above either groundwater quality standards or the background concentrations as measured at monitoring well MW-1. The identified chemicals in groundwater are: methylene chloride, trichloroethene, benzene, toluene, ethylbenzene, xylenes, N,N-dimethylaniline, aniline, trans-1,2-dichloroethene, methanol, and acetone. Monitoring data indicates that the identified chemicals have not migrated beyond the site property boundaries.

Maximum concentrations of the chemicals of concern observed in groundwater are presented in Table 1.

The naturally high sodium chloride content of the groundwater detected in the intermediate flow system exceeds the New York State groundwater quality standards, limiting the potable use of the site groundwater. No other exceedences of inorganic compounds were identified by the RI.

3.2 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. To date two health risks have been conducted for this site, one assuming an industrial use scenario and one assuming a residential use scenario. A more detailed discussion of the health risks can be found in the RI Report.

An exposure pathway is the route by which an individual comes into contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental medium 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.

Completed pathways which are known to or may exist at the site in the future include:

- o Dermal contact, inhalation or ingestion of soils and dust.

- o Dermal contact with groundwater at the site.

- o Inhalation of chemicals volatilized from groundwater or ingestion of groundwater in a residential setting.

- o Inhalation of contaminants volatilized from soils during construction activities.

This proposed plan deals with the source of contamination in the unsaturated surface soils at the site. Hence, the soil contamination routes of exposure will be addressed but the groundwater will only be dealt with to the extent that the source in the unsaturated soils will be mitigated and further degradation of the groundwater should not occur.

The remaining operable unit for this site will address the saturated soils and the groundwater, which will be the second operable unit at this site. Any remediation necessary to address this remaining contamination will be the subject of a future ROD.

3.3 <u>Summary of Environmental Exposure Pathways</u>:

This section summarizes the types of environmental exposures which may be presented by the site. The Habitat Based Assessment included in the RI presents a more detailed discussion of the potential impacts from the site to fish and wildlife resources. The RI concludes that there is a hydrogeologic connection between the shallow groundwater and the Barge Canal, however, the RI has not identified contaminant migration beyond the site boundaries. Therefore, at the present time, the site does not appear to be impacting the Barge Canal and/or Onondaga Lake. The following pathways for environmental exposure have been identified:

* Potential for contaminants leaching into groundwater and then possibly discharging into Barge Canal/ Onondaga Creek and thence to Onondaga Lake.

* Contaminants leaching into ponded surface water and reaching wildlife.

* Contaminants affecting surface and subsurface wildlife through direct contact, ingestion, or inhalation.

SECTION 4: ENFORCEMENT STATUS

The NYSDEC and the McKesson Corporation entered into a Consent Order on June 10, 1987. The Order obligates the responsible parties to implement a full remedial program. The order was amended on June 20, 1990 to incorporate Safety Kleen Environsystems Company as a PRP.

The following is the chronological enforcement history of this site.

Date	Index No.	Order Subject
6/10/87	R7-0766-84-03	Remedial Program
6/20/90	R7-0766-84-03	Amended Remedial Program

SECTION 5: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. These goals are established under the guideline of meeting all standard, criteria, and guidance (SCGs) and protecting human health and the environment.

At a minimum, the remedy selected for the unsaturated surface soils should eliminate or mitigate all significant threats to the public health and to the environment presented by the hazardous waste disposed and remaining in the surface soils at the site through the proper application of scientific and engineering principles. The potential for exposure due to groundwater will be addressed by a second operable unit.

The goals selected for the unsaturated soils operable unit of this site are:

- Reduce, control, or eliminate the contamination present within the unsaturated soils on site.
- Eliminate a threat to surface waters 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.
- Monitor the impacts of contaminated groundwater to the environment.

SECTION 6: SUMMARY OF THE EVALUATION OF ALTERNATIVES

Potential remedial alternatives for the unsaturated soils at the McKesson Envirosystems (Inland) site were identified, screened and evaluated in a Feasibility Study. This evaluation is presented in the report entitled **Feasibility Study, November 1993.** A summary of the detailed analysis follows.

6.1: Description of Remedial Alternatives

The potential remedies are intended to address the contaminated unsaturated soils at the site and they are:

Alternative No. 1
No Action

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.

The site would remain in its present condition, and human health and the environment would not be provided any additional protection.

Alternative No. 2
Low Permeability Cap

Present Worth:	$1,900,000
Capital Cost:	$1,900,000
Annual O&M:	$18,000
Time to Implement:	1 year

Construction of a low-permeability cap over a five-acre portion of the site would minimize the infiltration of precipitation through the soils containing the chemicals of concern. The cap would be constructed of a low-permeability material such as natural clay, geosynthetics, asphalt or combinations of these materials, and would include drainage and top soil layers to achieve a well drained, vegetated surface upon completion. Limiting the amount of precipitation that percolates through the soils would reduce the leaching of the chemicals of concern into the groundwater beneath the site.

Prior to cap construction, impacted soils from the portion of the site located north of Van Rensselaer Street would be excavated and placed on the portion of the site to be covered by the cap (south side of Van Rensselaer Street). The resulting excavations would be backfilled with imported select clean fill material and compacted, and the site would be graded to promote drainage. Storm water run-off from the cap would drain to a storm water collection system located around the perimeter of the cap, which would discharge into the Barge Canal.

Alternative No. 3a
On-Site High-Temperature Incineration

Present Worth:	$10,600,000
Capital Cost:	$10,600,000
Annual O&M:	$18,000
Time to Implement:	1 year

This alternative consists of excavating the estimated 10,000 cubic yards of impacted site soils and treating them in an on-site incinerator. This treatment technology has proven effective in treating soils containing organic constituents.

Incineration is a process that utilizes high temperature (typically between 1,400 and 2,200 degrees Fahrenheit) to thermally destruct organic compounds present in soils. Three types of mobile incinerators commonly utilized include fluidized bed, rotary kiln, and infrared incinerators. The most common of these is the rotary kiln incinerator, which is described in this evaluation.

Site soils would be excavated, stockpiled, and screened to remove debris greater than two inches in diameter. Soil and debris with diameters greater than two inches would either be crushed prior to being fed into the high-temperature incinerator (HTI) with the smaller soil particles, or stockpiled and cleaned by another method such as steam cleaning. The screened soils would be fed directly into the HTI's rotating refractory-lined kiln. Lifters attached to the inside of the kiln are used to agitate the soils to improve heat transfer.

The combustion gases, which contain volatilized organic compounds, exit the kiln and pass through a hot cyclone for removal of relatively large particulates. The gases then pass from the cyclone into a secondary combustion chamber where any remaining organic vapors, carbon monoxide, and particulates are destroyed at temperatures of 1,800 to 2,200 degrees Fahrenheit. Any remaining combustion gases pass through an evaporative cooler to cool the gases, a bag house to collect particulates, and a paced-bed alkaline scrubbing unit to remove acid gases. The treated gases are then discharged to the atmosphere.

The HTI would be operated continuously until the site soils were satisfactorily treated. Continuous operation of the HTI would also increase the efficiency of the unit over the duration of the project.

After treatment, the resulting flyash (treated soils) is discharged from the incinerator into a pugmill, where filtered process water is added to cool the flyash and control dust. The treated soils would be analyzed for the chemicals of concern to verify that the soil cleanup levels had been achieved.

The treated soils may also require solidification to ensure that the soils meet TCLP requirements for inorganic constituents that may be concentrated by incineration. The solidified soils would then be directly backfilled on-site. The site would require a CAMU designation so that the incinerated and solidified soils could be backfilled directly without requiring the construction of a RCRA landfill cell.

Air monitoring would insure that on-site workers as well as the surrounding community are not exposed to volatilized contaminants during remediation.

Alternative No. 3b
On-Site Low-Temperature Thermal Desorption (LTTD)

Present Worth:	$4,240,000
Capital Cost:	$4,240,000
Annual O&M:	$18,000
Time to Implement:	1 year

This alternative consists of excavating 10,000 c.y. of impacted site soils and treating them on-site using a mobile LTTD unit. This treatment technology has proven effective at treating soils containing organic constituents.

LTTD is a process by which soils containing organic compounds are heated, and the organic compounds are volatilized from the soils into an induced air flow.

Site soils would be excavated, stockpiled, and screened to remove debris greater than two inches in diameter. Soil and debris with diameters greater than two inches would either be crushed prior to being fed into the LTTD with the small soil particles, or stockpiled and cleaned by another method, such as steam cleaning. The screened soils would be fed directly into the LTTD's rotating kiln, where the soil would be heated to 500 to 1,200 degrees Fahrenheit. The rotation of the kiln mixes the soils and conveys them through the unit. The moisture and organics vaporize due to the elevated temperature, and are released from the soil. The off-gases, which contain volatile organics and some particulates, are collected and treated further with a combustion after-burner or by passing the gases through a system consisting of a cyclone, baghouse, wet scrubber and activated carbon bed. In the combustion after-burner, the collected gases are incinerated at 1,800 to 2,200 degrees Fahrenheit. In the alternate system, the cyclone and baghouse remove the soil particulate, the wet scrubber removes the acid gases, and the activated carbon removes any remaining organics.

After processing is complete, the treated soils are transferred from the kiln into a pugmill, where water is added to cool the soils and reduce dust production. The treated soils are then stockpiled for backfill pending analytical testing.

Air monitoring would insure that on-site workers as well as the surrounding community are not exposed to volatilized contaminants during remediation.

Alternative No. 4a
Biological Treatment Using In-Situ Soil Blending

Present Worth:	$1,340,000
Capital Cost:	$1,340,000
Annual O&M:	$18,000
Time to Implement:	1 year

Biological treatment of soils is accomplished through the stimulation of indigenous microorganisms that use the biodegradable chemical constituents present in the soils as a source of carbon and energy, while converting them into carbon dioxide and water. Biological treatment through in-situ soil blending consists of mixing soils in place to improve the mass transfer of oxygen and nutrients which in turn enhances the growth and activity of aerobic bacteria.

In-situ biological treatment using soil blending at the site would require that the impacted soils be mixed and aerated using a hydraulic implement installed on an excavator.

Surface water would have to be pumped from one bermed area to another to facilitate treatment and would also be used as needed during the treatment process to maintain the desired moisture content within the soils being treated.

Air monitoring for total organic vapors, methylene chloride, and dust daily during the mixing activities would ensure that on-site workers and potential off-site receptors were not exposed to unacceptable levels of the chemicals of concern. Fertilizer would be added to the plot as required to maintain optimum nutrient levels.

Volatilization of chemical constituents can be controlled by adjusting the soil mixing rate to meet the NYSDEC air emissions requirements for remedial processes.

Alternative No. 4b
Ex-Situ Liquid/Solid Phase Bioremediation

Present Worth:	$1,880,000
Capital Cost:	$4,200,000
Annual O&M:	$233,000
Time to Implement:	16 years

Ex-situ liquid/solid phase bioremediation of soils involves treating excavated soils in a vessel. The estimated 10,000 c.y. of impacted soils would be excavated and would then be mixed with nutrient-amended water in a tank reactor to produce a slurry of 10 to 30 percent solids by weight.

In order to increase the level of dissolved oxygen, the slurry would be continuously aerated. In addition, the slurry is continuously mixed to maintain the solids in suspension and to ensure that the microorganisms make contact with the chemicals of concern. The bioremediation process can be operated in either a batch or continuous mode.

Once biodegradation is complete, the solids would be settled out from the treated slurry and residual water would be recycled back into the bioreactor. The treated, settled solids would then be sampled to ensure that the Remedial Action Objectives (RAO) had been achieved. Once the RAO is achieved, the solids would be backfilled into the excavated areas.

Air monitoring would insure that on-site workers as well as the surrounding community are not exposed to volatilized contaminants during remediation.

Alternative No. 4c
Ex-Situ Solid-Phase Bioremediation

Present Worth:	$2,160,000
Capital Cost:	$2,160,000
Annual O&M:	$18,000
Time to Implement:	1 year

The ex-situ solid-phase bioremediation technique consists of biologically treating the 10,000 c.y. of soils containing the chemicals of concern on a constructed land treatment cell. The treatment cell would consist of a polyethylene geomembrane liner covered with a one-foot-thick drainage layer of clean sand. The treatment cell would be surrounded by a lined storm water collection system to collect leachate and runoff from the cell. The system would be sloped to a lined sump where the collected liquids would remain until the soils on the cell required additional moisture. The liquids would then be reapplied to the treatment cell.

The cell would be loaded with a single layer of impacted soils approximately 12 to 15 inches deep. The soils on the cell would then be mixed with a chisel plow to enhance the mass transfer of gaseous oxygen. Fertilizer and water would be added, as needed, to maintain optimum conditions for bioremediation.

Once the RAO had been achieved, the treated soils would be placed back into the areas that they were excavated from.

Air monitoring would insure that on-site workers as well as the surrounding community are not exposed to volatilized contaminants during remediation.

Alternative No. 5
Off-Site Disposal at a RCRA-Permitted Landfill

Present Worth:	$21,060,000
Capital Cost:	$21,060,000
Annual O&M:	$18,000
Time to Implement:	1 year

This alternative would consist of excavating site soils that contain the chemicals of concern with concentrations above the soil cleanup levels and disposing of these soils off-site at a RCRA-permitted landfill facility.

The soils that contain the chemicals of concern with concentrations that exceed the cleanup levels would be excavated and placed into lined roll-offs. The roll-offs would then be loaded onto trucks and exterior surfaces decontaminated prior to leaving the site. Because the site soils are considered a hazardous waste, each roll-off would be sampled to characterize the soils prior to transport off site. If the soils meet the requirements of the Landfill Disposal Restrictions (LDRs) contained in 40 CFR 268, they would be taken directly to a RCRA-permitted hazardous waste landfill. If the soils are identified as not meeting the LDR requirements, they would have to be pre-treated prior to disposal at a RCRA-permitted landfill. For purposes of evaluating this alternative, incineration has been considered. Therefore, soils not meeting the LDR requirements would be transported to an off-site RCRA-permitted incinerator and incinerated prior to final landfill disposal. Based on existing site data, it has been estimated that approximately 80 percent of the site soils would require pre-treatment prior to land disposal.

The excavated areas of the site would be backfilled with imported select fill material and compacted. Upon completing the backfilling activities, the site would be graded to promote drainage.

Air monitoring would insure that on-site workers as well as the surrounding community are not exposed to volatilized contaminants during remediation.

Alternative No. 6
Off-Site Incineration

Present Worth:	$23,640,000
Capital Cost:	$23,640,000
Annual O&M:	$18,000

Time to Implement: 1 year

This alternative would involve excavating site soils that contain the chemicals of concern with concentrations above the soil cleanup levels and transporting them off site to a RCRA-permitted incinerator for treatment.

The soils that contain the chemicals of concern with concentrations that exceed the cleanup levels identified in the RAO would be excavated and placed into lined roll offs. The roll offs would then be loaded onto trucks and exterior surfaces decontaminated prior to leaving the site. A licensed hazardous waste hauler would transport the filled roll offs off site to a RCRA-permitted incinerator for treatment.

The excavated areas of the site would be backfilled with imported select fill material and compacted. After the backfilling activities were complete, the site would be graded to promote drainage.

Air monitoring would insure that on-site workers as well as the surrounding community are not exposed to volatilized contaminants during remediation.

6.2 Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6 NYCRR Part 375). For each of the criteria, a brief description is provided. 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.

At this site the source of contamination in the unsaturated soils is being addressed by the remedy and the cleanup goals for the site are based on the NYSDEC, Technical and Administrative Guidance Memoranda (TAGM), HWR-92-4046.

The bioremediation remedy proposed for the site meets the alternative technology based cleanup levels determined by the Department as acceptable due to the site-specific conditions and the overall mass reduction of contaminants at the site.

The site-specific conditions of the site which influence the cleanup objectives are the groundwater use and potential migration of contaminants into Onondaga Lake.

The naturally high salinity and total dissolved solids concentration make and have made the groundwater unsuitable as a potable water supply. Concentrations of chloride in groundwater beneath the site range from 32,000 to 77,000 mg/l. The NYSDEC Class GA water quality standard for chloride is 250 mg/l.

Based on the presence of naturally-high salinity and total dissolved solids concentration, remediating the chemicals of concern present in groundwater beneath the site will not be sufficient to make the groundwater suitable for potable use.

Based on these conclusions, the Remedial Action Objectives (RAO) for the site are to reduce the concentration of the chemicals of concern in unsaturated soils to levels which will mitigate the potential leaching of these chemical constituents to groundwater, annual groundwater monitoring to verify that the chemicals of concern are not migrating past the site boundary and deed restrictions to prevent future use of and potential human exposure to site groundwater.

These RAOs, can be met using technology-based soil cleanup levels. The soil cleanup levels are based on the use of bioremediation as the remedial alternative for soils at the site and the practical limit of the technology in attaining groundwater protection cleanup levels. The cleanup levels are presented in Table 2.

Alternatives 1 and 2 do not meet the cleanup guidance criteria. Alternatives 3,4, 5, and 6 meet the RAOs and the guidance criteria. Any discharges of water and/or gas made necessary by these technologies would also be able to comply with State regulations.

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.

Alternatives 1 and 2 do nothing to mitigate the source of contamination at this site and allow further contaminant migration from the unsaturated soils at the site, although alternative 2 would serve to slow the rate of migration by limiting the amount of precipitation infiltrating the waste at the site. The remainder of the alternatives are protective of human health and the environment through either removal, destruction or treatment.

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

All alternatives can be implemented within a two year time period. A third bioremediation option (i.e. 4c) would take an estimated sixteen years to implement and has been eliminated for that reason.

The adverse short term impacts, due to the remediation, are a function of contaminant volatilization during material handling of the soils. Alternative 4a with in-situ soil blending would have controllable emissions by virtue of the ability to slow down mixing or stop if emissions occur and use mitigation

Table 2
Soil Cleanup Levels

Methylene chloride	10 ppm
Trichloroethene	10 ppm
Benzene	10 ppm
Toluene	10 ppm
Ethylbenzene	10 ppm
Xylene	10 ppm
N,N-dimethylaniline	10 ppm
Aniline	10 ppm
Methanol	10 ppm
Acetone	10 ppm

measures to minimize volatilization. Alternatives 3, 5, and 6 also involve extensive material handling with 5 and 6 including off-site trucking during which contaminant volatilization would be a concern during this handling.

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

Alternative 1 would not be effective because it does not remove contaminants from the unsaturated soils. Alternative 2 would not remove contaminants from the soils, but it would slow the potential migration by reducing the infiltration of precipitation into the site waste. All the remaining are effective in that the source of contamination is removed from the site. The residual contaminants remaining on site would be less than 5 ppm in undisturbed areas and less than 10 ppm in treated areas. These concentrations are below the acceptable human health guidelines contained in the guidance HWR-92-4046 and the environmental concerns associated with leaching into the groundwater would be minimized.

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.

Alternative 1 would have no effect on the mobility, toxicity or volume. Alternative 2 would have no reduction in toxicity or volume but would reduce mobility by preventing rainwater and surface water from entering the contaminant mass and transporting contaminants off site.

Incineration via alternatives 3 and 6 would destroy the contaminants at the site, however, the material handling would result in some volatilization of contaminants into the atmosphere.

Alternative 3 would destroy most of the contaminant mass at the site and volatilization would be minimized by in-situ blending of the soils. The ex-situ biotreatment would require more material handling and result in greater volatilization of contaminants.

Alternative 5 would remove the material from the site and is not a contaminant destruction technology. The material handling would result in volatilization of some of the contaminants.

Alternative 3a appears to be the most effective choice to maximize destruction of the contaminant mass while minimizing the loss of contaminants due to volatilization.

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

All of the alternatives can be implemented at this site. Alternatives 1 and 2 are the easiest to implement due to the fact that they do not move or treat the contaminant mass at the site.

The on-site destruction technologies, alternatives 3 & 4 are more technically challenging and would require air monitoring and soil sampling for verification that remediation has occurred. Nevertheless, these alternatives can be implemented. Although the bioremediation alternative would be the most difficult to implement due to the necessary growth of microorganisms and insuring that they consume the contaminants, a treatability study completed in 1993 has documented the success of this technology at this site. The administrative task of verifying that the remediation has been completed satisfactorily would require more detail during design to insure a performance criteria as well as a sampling methodology to verify that the cleanup levels have been obtained throughout the site.

The off-site technologies, alternatives 5 & 6 would require monitoring and sampling during the excavation of the contaminated soils.

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 3.

The cost varies with the amount of material handling required and the amount of chemical processing required. Capping requires no handling of the contaminants and no chemical processing and the costs are the lowest of those which could be implemented at the site.

Bioremediation has minimal material handling in order to aerate the soils and to grow the microorganisms. The chemical processing is done by the microorganisms as they consume the chemical contaminants. The cost associated with bioremediation is the lowest of the treatment technologies.

Thermal desorption requires more chemical processing to destroy the chemical contaminants and the cost is roughly twice that of bioremediation.

The off-site destruction technologies have high costs associated with transportation and ultimate disposal, which is typical for these technologies. These costs are so high as to eliminate these technologies from consideration. Bioremediation is roughly one-tenth the cost of off-site treatment.

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" has been prepared which describes the comments received and the Department's response to the concerns raised. No public concerns were voiced in opposition to the proposed remedy. The Responsiveness Summary is included as Appendix A.

SECTION 7: SUMMARY OF THE SELECTED ALTERNATIVE

Based upon the results of the RI/FS, and the evaluation presented in Section 6, the NYSDEC is selecting alternative 4a: **Biological Treatment Using In-Situ Soil Blending**, as the remedy for this site.

This selection is based upon the following: Alternative 1 was not selected because it was not protective of the environment and would allow continued exposure to contaminants both through surface exposure routes and groundwater exposure routes. Alternative 2 would eliminate the route of exposure to surface soil contaminants but was not chosen because it would not eliminate the source of contamination, and would allow continued migration of the contaminants into the groundwater, although at a lesser rate than alternative 1. Alternatives 3, 5 and 6 are capable of meeting all the pertinent criteria, however, the cost of remediation is not justified for the off-site technologies given that alternative 4 can achieve equal or better results. Alternative 4 was chosen because it would meet all the criteria and does so at a reasonable cost.

Alternative 4a was chosen over 4b due to the practical consideration that more of the mass of contaminants will be bioremediated versus volatilized in this technology. The implementation of in-situ bioremediation lessens the handling of the soils and hence reduces the loss of contaminants due to volatilization. This technology will attain the technology-based cleanup levels, which substantially comply with the Remedial Action Objectives, and will result in a greater destruction of contaminant mass than any other technology.

The present worth cost to implement the remedy is $1,340,000.

The saturated soils and groundwater will be addressed as part of a separate operable unit for this site. Until the contaminated groundwater is dealt with, the possibility of recontamination of the saturated soils will still exists, therefore these media must be addressed together. The site will remain on the NYS Registry of Inactive Hazardous Waste Sites, as a class 2 site, until the second operable unit, and any other identified problems, are resolved through the remedial process.

The elements of the selected 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. Uncertainties identified during the RI/FS would be resolved.

2. In-situ bioremediation of all areas of the site where the contaminants of concern are greater than 5 ppm (see Figure 2).

Table 3
Remedial Alternative Costs

ALTERNATIVE	ESTIMATED PRESENT WORTH COST
No Action	-
Low Permeability Cap	$1,900,000
On-Site High Temperature Incineration	$10,630,000
On-Site Low Temperature Thermal Desorption (LTTD)	$4,240,000
Biological Treatment Using In-Situ Soil Blending	$1,340,000
Ex-Situ Liquid-/Solid-Phase Bioremediation	$4,200,000
Ex-Situ Solid Phase Bioremediation	$2,160,000
Off-Site Disposal at a Permitted Landfill	$21,060,000
Off-Site Incineration	$23,640,000

3. Attainment of technology-based cleanup levels and performance of bioremediation for a minimum 60 days as measured by a performance standard to be developed during the design phase of remediation and accepted by the Department. Should technology-based levels not be achieved in 60 days bioremediation would continue to a minimum 90 days duration and continue thereafter until the cleanup levels are achieved.

4. Final contouring with a minimum of 12 inches of clean soil, grading and seeding of the site to promote surface water runoff and limit the infiltration of rain and surface water into the remediated areas.

5. Installation of additional monitoring well(s) to supplement the existing site perimeter groundwater monitoring network.

6. Conducting a program of groundwater sampling and analysis to verify that contamination has not migrated off the site. The present worth cost of this program is $275,000.

   The groundwater at the site and the contaminants in the saturated soils would be monitored by McKesson to verify to the NYSDEC that no off-site migration is occurring.

However, should evidence of off-site migration be discovered, the PRP would be required to implement remedial actions to prevent contaminant migration from leaving this site. A map showing the extent of groundwater contamination and the proposed monitoring network is attached as Figure 3.

SECTION 8: <u>HIGHLIGHTS OF COMMUNITY PARTICIPATION</u>

As part of the remedial investigation process, a number of Citizen Participation (CP) activities were undertaken in an effort to inform and educate the public about the conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- A repository for documents pertaining to the site was established.
- A site mailing list was established which included nearby property owners, local political officials, local media and other interested parties.
- A notification of the Proposed Remedial Action Plan (PRAP) was sent to interested individuals/groups announcing the availability of the PRAP and the public comment period.
- A public meeting was held on February 16, 1994 to discuss the proposed remedy for Operable Unit No. 1 and obtain public comment on it.
- A Responsiveness Summary was prepared to answer all comments received on the PRAP.

FIGURES

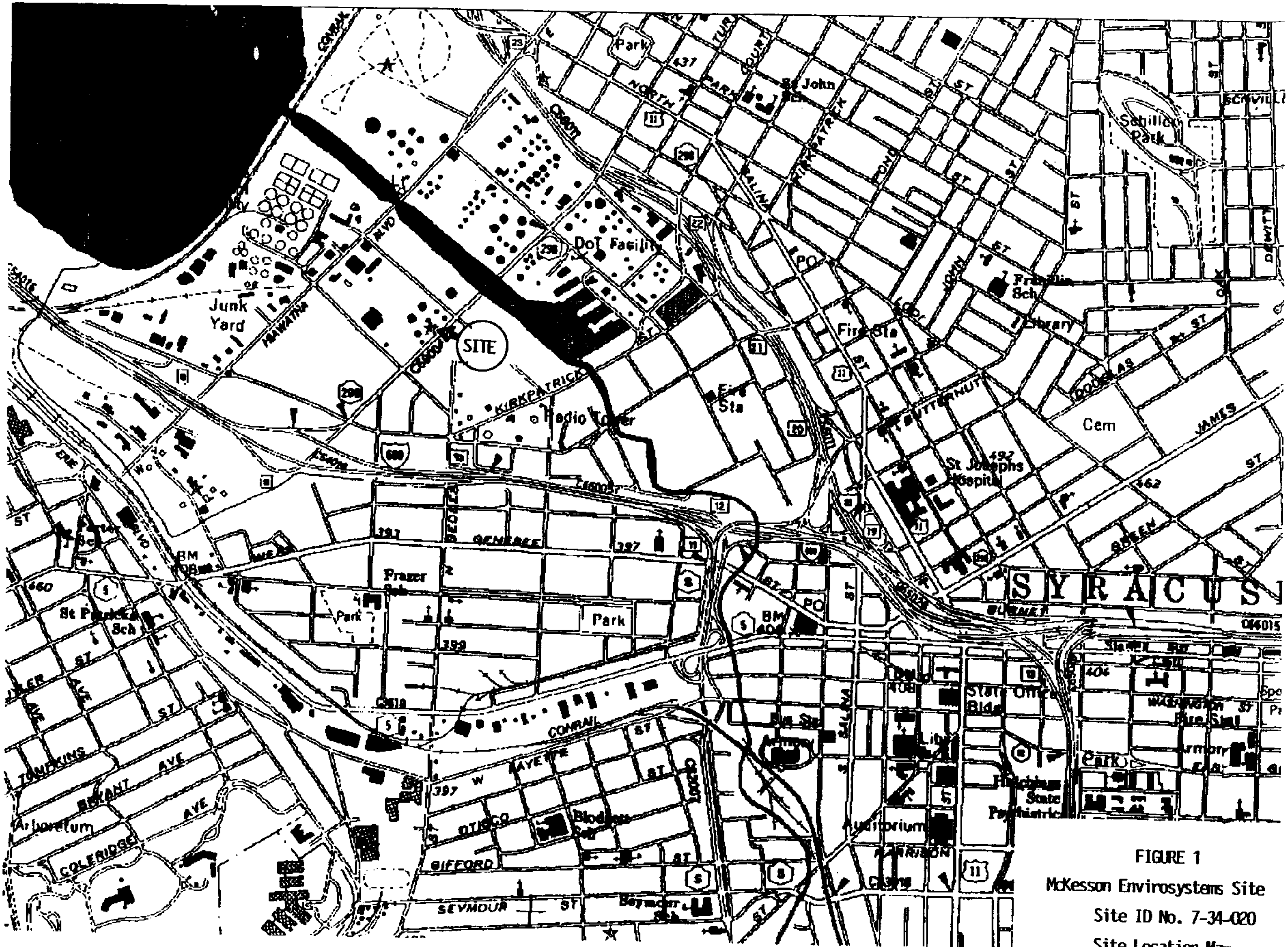
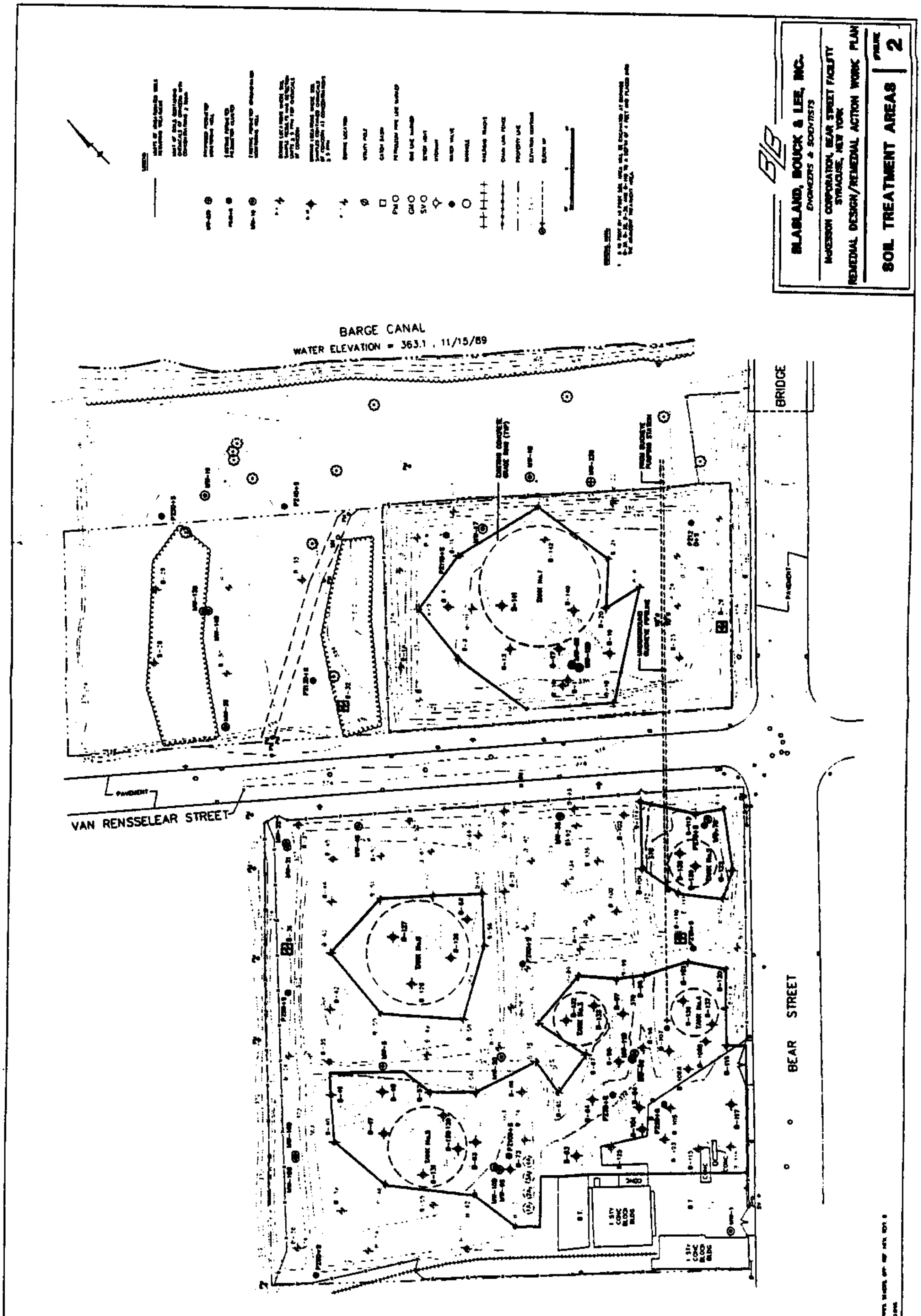
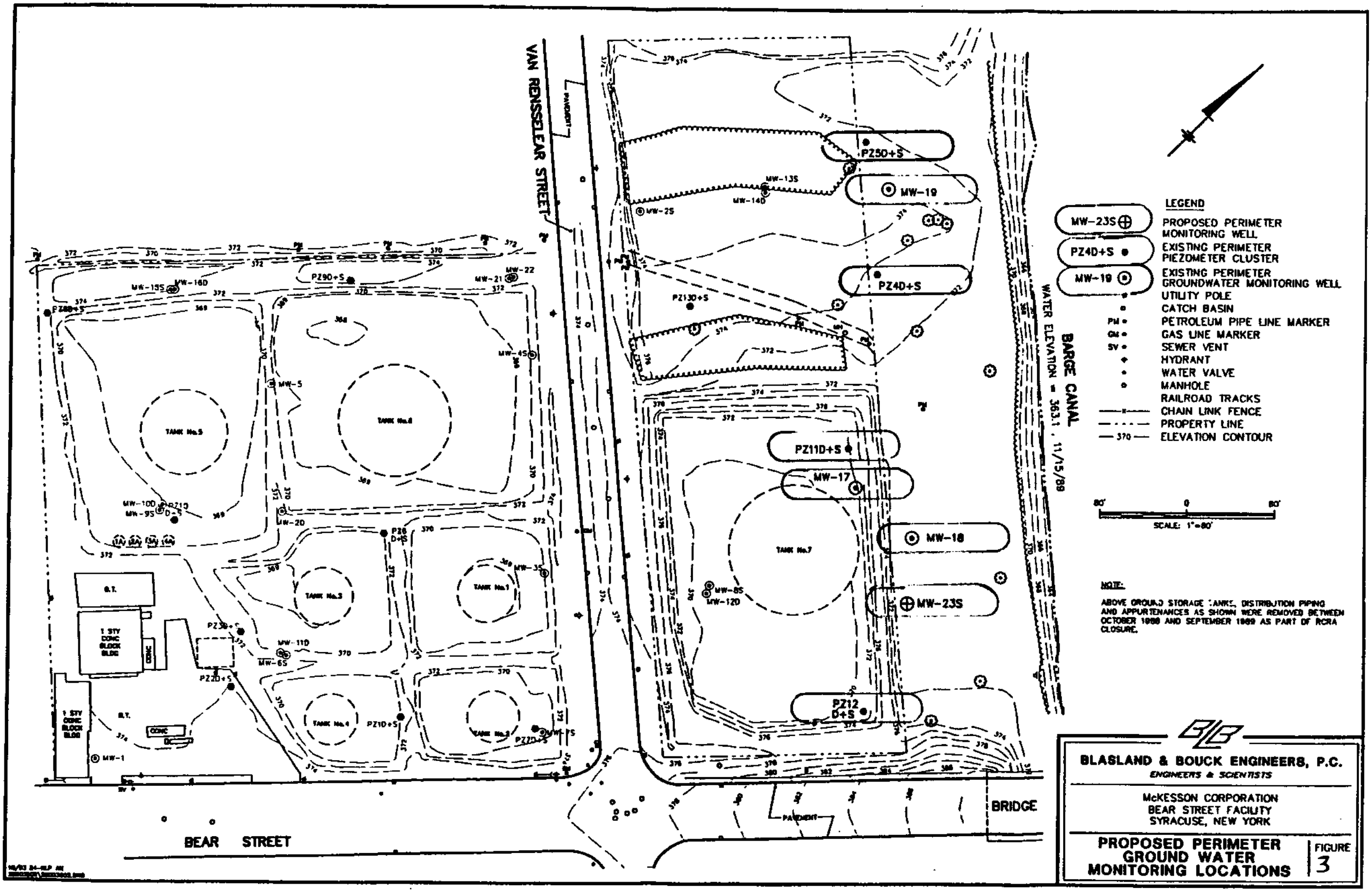


FIGURE 1
McKesson Envirosystems Site
Site ID No. 7-34-020
Site Location Map


BARGE CANAL
WATER ELEVATION = 363.1 , 11/15/89
BRIDGE
VAN RENSSELEAR STREET
BEAR STREET
PAVEMENT
BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS
McKESSON CORPORATION, BEAR STREET FACILITY
SYRACUSE, NEW YORK
REMEDIAL DESIGN/REMEDIAL ACTION WORK PLAN
SOIL TREATMENT AREAS
FIGURE 2


VAN RENSSELEAR STREET
BEAR STREET
BRIDGE
BARGE CANAL
WATER ELEVATION = 363.1 , 11/15/89
PAVEMENT
TANK No.1
TANK No.2
TANK No.3
TANK No.4
TANK No.5
TANK No.6
TANK No.7
1 STY CONC BLOCK BLDG
PZ5D+S
MW-19
PZ4D+S
PZ11D+S
MW-17
MW-18
MW-23S
PZ12 D+S
PZ13D+S
MW-2S
MW-13S
MW-14D
MW-15S
MW-16D
MW-21
MW-22
MW-4S
MW-5
PZ8D+S
PZ9D+S
MW-10D
MW-9S
MW-20
PZ6 D+S
MW-3S
MW-11D
MW-6S
PZ3D+S
PZ2D+S
PZ1D+S
MW-7S
PZ7D+S
MW-1
MW-8S
MW-12D
LEGEND
MW-23S PROPOSED PERIMETER MONITORING WELL
PZ4D+S EXISTING PERIMETER PIEZOMETER CLUSTER
MW-19 EXISTING PERIMETER GROUNDWATER MONITORING WELL
UTILITY POLE
CATCH BASIN
PM PETROLEUM PIPE LINE MARKER
GM GAS LINE MARKER
SV SEWER VENT
HYDRANT
WATER VALVE
MANHOLE
RAILROAD TRACKS
CHAIN LINK FENCE
PROPERTY LINE
370 ELEVATION CONTOUR
80' 0 80'
SCALE: 1"=80'
NOTE:
ABOVE GROUND STORAGE TANKS, DISTRIBUTION PIPING AND APPURTENANCES AS SHOWN WERE REMOVED BETWEEN OCTOBER 1988 AND SEPTEMBER 1989 AS PART OF RCRA CLOSURE.
BLASLAND & BOUCK ENGINEERS, P.C.
ENGINEERS & SCIENTISTS
McKESSON CORPORATION
BEAR STREET FACILITY
SYRACUSE, NEW YORK
PROPOSED PERIMETER GROUND WATER MONITORING LOCATIONS
FIGURE 3

APPENDIX A

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Thomas C. Jorling
Commissioner

RESPONSIVENESS SUMMARY

McKesson Envirosystems Inactive Hazardous Waste Site
Operable Unit No. 1 - Unsaturated Soils
Proposed Remedial Action Plan
Syracuse, Onondaga County
Site No. 7-34-020

The Proposed Remedial Action Plan (PRAP) for the McKesson Envirosystems Site, Operable Unit No. 1, was prepared by the New York State Department of Environmental Conservation (NYSDEC) and issued to the local document repository on January 24, 1994. This Plan outlined the remedial measure proposed for remediation of the unsaturated soils at the McKesson Envirosystems site. The preferred remedy consists of biological treatment using in-situ soil blending.

The release of the PRAP was announced via a notice to the mailing list, informing the public of the PRAP's availability.

A public meeting was held on February 16, 1994 which included a presentation of the Remedial Investigation (RI) and Feasibility Study (FS) as well as a discussion of the proposed remedy and the treatability study performed to evaluate its effectiveness. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. No comments were voiced at the meeting. Written comments were received from Blasland, Bouck and Lee, Inc., on behalf of McKesson Envirosystems (Inland), in a letter dated February 23, 1994. These comments have become part of the administrative record for this site.

The following are the comments received, with the NYSDEC's responses:

<u>Comment letter, dated February 23, 1994, from Blasland, Bouck and Lee:</u>

<u>COMMENT No. 1:</u>

The ROD should not include the PRAP's discussion about groundwater conditions and standards. The intent of the ROD should be to address remediation of Operable Unit No. 1, which does not include groundwater or saturated soils. Thus, there is no need for the ROD to address groundwater issues other than to affirm that the remedial action goal is to mitigate contaminant migration from the unsaturated soils into the groundwater. Should the ROD discuss groundwater conditions and standards, it should be made clear and at the beginning of that discussion that groundwater is and has historically been unusable as a potable water supply due to its high chloride concentrations which contravene the New York State Department of Environmental Conservation (NYSDEC) Class GA water quality standards.

RESPONSE No.1:

The PRAP is the means by which the proposed remedy is presented to the public. The PRAP must contain a clear description of the site which includes the contamination detected, the lateral and vertical extent of that contamination and the media affected. It is necessary to discuss the contamination detected in groundwater since continued monitoring and a contingency to address migration are components of the ROD. It is necessary for the PRAP to address any and all information used in support of the remedy selected. This includes a discussion of all investigations to date and the findings of those studies. The PRAP, and now the ROD clearly state that the unsaturated soils are the subject of the document, however, it is appropriate to identify that groundwater is contaminated and that this problem will be dealt with as a separate operable unit.

The limited potable use of the groundwater is discussed within Section 4 of the PRAP. This has been reiterated at the beginning of the section entitled "Groundwater", in the ROD.

COMMENT No. 2:

The ROD for Operable Unit No. 1 should not imply that groundwater will be remediated in the future. As stated on page 2 of the PRAP, "The remaining operable unit for this site will address the saturated soils and groundwater, which will be the second operable unit at this site. Any remediation necessary will be subject of a future PRAP."

RESPONSE No.2:

Contamination has been documented in groundwater. It is the State's intention that this problem be addressed as a second Operable Unit and various remedial alternatives, including no action, will be evaluated in a future PRAP. The text on page 2 of the PRAP states that <u>any</u> remediation necessary will be the subject of a future PRAP. All references to groundwater in the ROD will be consistent with this statement.

COMMENT No. 3:

The remedy's anticipated reduction of chemicals of concern in soils will not completely eliminate the potential leaching of these chemicals to groundwater. Instead, the remedy will significantly minimize the potential leaching of the chemicals from unsaturated soils into groundwater. For this reason, the goals presented in the ROD be revised to read:

- o Reduce, control, or mitigate the contamination present within the unsaturated soils on-site.
- o Eliminate or mitigate a threat to surface waters by eliminating or mitigating any future

contaminated surface runoff from the contaminated soils on-site.

o Eliminate or mitigate the potential for direct human or animal contact with the contaminated soils on-site.

o Monitor the impacts of contaminated groundwater to the environment.

<u>RESPONSE No. 3:</u>

By definition a goal is the end toward which effort is directed. The goals listed are specific to Operable Unit No. 1, but were established through the remedy selection process stated in 6NYCRR Part 375. Recognizing the remedy's anticipated reduction of chemical concentrations may not completely eliminate potential leaching to groundwater, it would be inappropriate to not strive to achieve maximum removal. The goals for the remedial program, as presented in the PRAP, will remain as stated.

<u>COMMENT No. 4:</u>

A statement should be inserted on page 2 in the second paragraph to clarify that the site does not contain any NYSDEC-designated wetlands and that the remedial activities would not be subject to the requirements of 6NYCRR parts 662 through 665.

<u>RESPONSE No. 4:</u>

The text will be revised to state that no NYSDEC-designated wetlands are located on site.

<u>COMMENT No. 5:</u>

The ROD should define the unsaturated soils to be addressed by the remedy as those which are present above a groundwater elevation of 365 feet. The PRAP states that the unsaturated soils on the northern portion of the site lie above a groundwater elevation of 364 feet. Groundwater elevation data collected from the monitoring wells and piezometers located on the northern portion of the property for the years 1992 and 1993 indicates that the groundwater elevation ranges from approximately 367 feet in December to 365 feet in June.

<u>RESPONSE No. 5:</u>

Based on the more recent groundwater data, which was not included in the RI/FS report, the text will be revised to define the unsaturated soils to be addressed by the remedy as those which are "present above a groundwater elevation of 365 feet, unless field conditions support that a greater depth (i.e lower elevation) would be appropriate."

<u>COMMENT No. 6:</u>

In closing, the ROD should state that the NYSDEC has determined that the selected remedy likely will achieve the cleanup levels (Table 3 of the PRAP) and that those cleanup levels substantially comply with the Remedial Action Objectives (RAOs) (page 15 of the PRAP). This approach is consistent with the statement on page 16 of the PRAP that "the environmental concerns associated with leaching into the groundwater would be minimized" by the selected remedy.

RESPONSE No. 6:

The text will be revised as suggested.

APPENDIX B

ADMINISTRATIVE RECORD

The following documents, which have been available at the document repositories, constitute the Administrative Record for the McKesson Envirosystems Site, Remedial Investigation/ Feasibility Study.

APRIL 1990:	Remedial Investigation Report
NOVEMBER 1993:	Feasibility Study Report
JANUARY 1994:	Proposed Remedial Action Plan, Operable Unit No. 1
FEBRUARY 1994:	1992 Groundwater Monitoring Program McKesson Corporation
FEBRUARY 1994:	Responsiveness Summary, Operable Unit No. 1