Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Chem-Core Site
Buffalo (C), Erie County, New York
Site Number 9-15-176

January 2003

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* ERIN M. CROTTY, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Chem-Core Inactive Hazardous Waste Disposal Site
Buffalo (C), Erie County, New York
Site No. 9-15-176

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the Chem-Core site, a Class 2 inactive hazardous waste disposal site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Chem-Core inactive hazardous waste disposal site, and the public's input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A listing 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 releases of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential significant threat to public health and/or the environment.

Description of Selected Remedy

Based on the results of the Remedial Investigation and Feasibility Study (RI/FS) for the Chem-Core site and the criteria identified for evaluation of alternatives, the NYSDEC has selected building demolition to provide access to areas of subsurface contamination, excavation of contaminated soil and off-site disposal and groundwater extraction and treatment, in stages. The components of the remedy are as follows:

- Demolish the building and dispose of the demolition debris off-site in a permitted facility.

- Excavate the contaminated subsurface soil (approximately 7,600 cubic yards) and dispose of the soil in off-site permitted facilities. The goal is to reduce soil contamination to levels consistent with those given in NYSDEC Technical and Administrative Guidance Memorandum (TAGM) No. 4046 to the extent practicable.

- Install groundwater recovery wells at the site to extract the contaminated groundwater.

- Install and operate a treatment system at the site to treat the extracted groundwater for disposal into the sanitary sewer system.

- Evaluate the results from the five-year operation of groundwater extraction and treatment. If concentrations have been reduced sufficiently, implement enhanced bioremediation or another available technology to achieve groundwater standards to the extent practicable.

- Implement a bioremediation pilot study for off-site groundwater contamination. This would occur during construction of the remedy. Based on the results from the pilot study, implement a full-scale remediation of off-site groundwater, if necessary.

- Implement a long-term operation, maintenance, and monitoring program for the groundwater extraction and treatment system.

- A notification will be sent to the county clerk for filing, to notify future owners of the site about the presence of residual contamination remaining in groundwater.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy selected for this site is 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.

JAN 29 2003

Date

Dale A. Desnoyers, Director
Division of Environmental Remediation

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City of Buffalo, Erie County, New York
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SECTION 1: SUMMARY OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health has selected this remedy for the Chem-Core site. The presence of hazardous waste has created significant threats to human health and/or the environment that are addressed by this remedy. As more fully described in Sections 3 and 4 of this document, past activities and disposal practices at the site have resulted in the disposal of a number of hazardous wastes, including trichloroethene (TCE), tetrachloroethene (PCE), and other volatile chemicals. These wastes have contaminated the subsurface soils and groundwater and have resulted in:

- a significant threat to human health associated with potential for human exposure to contaminated soil and groundwater at the site; and
- continuing releases of contaminants from soil to groundwater have created a significant environmental threat.

To eliminate or mitigate these threats, the NYSDEC has selected the following remedy:

- building demolition to provide access to areas of subsurface contamination;
- excavation of contaminated soil and off-site disposal; and
- groundwater extraction and treatment, in stages.

The selected remedy, discussed in detail in Section 7 of this document, is intended to attain the remediation goals selected for this site in Section 6. The remedy must conform with officially promulgated standards and criteria that are directly applicable, or that are relevant and appropriate. The selection of the remedy must also take into consideration guidance, as appropriate. Standards, criteria and guidance hereafter called as SCGs.

SECTION 2: SITE LOCATION AND DESCRIPTION

The Chem-Core site is located at 1382 Niagara Street in the City of Buffalo, Erie County, New York (Figure 1). The site is occupied by a 39,000 square foot industrial building on approximately 0.5 acres. The facility structure occupies most of the property, with exposed soil in a driveway/yard area at the north end of the site. Situated on an historically industrial corridor, the site is in close proximity to residential neighborhoods to the east and a rail corridor to the west with both the Interstate I-190 highway and the Black Rock Canal (which leads from Lake Erie to the Niagara River) farther to the west. Various industrial facilities are located to the south and north of the site.

An approximately ten foot tall concrete retaining wall separates the I-190 highway from the railway. The Black Rock Canal is immediately beyond a concrete and sheet-pile retaining wall to the west of the highway right-of-way. Refer to Figure 2 for the details of the site and the surrounding areas.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

Since its construction, the facility has been used for commercial operations. During the initial operation of the company, a significant percentage of the business was related to supplying acids to metal fabrication industries. In the early 1930s, operations included a chemical-handling facility, with several business and commercial tenants operating from rented portions of the site structure. From the review of an aerial photograph taken in 1938, the on-site building appeared to be similar to the existing condition and no significant changes have been made since 1938. During the 1950s, sales involved chlorinated solvents for dry-cleaning industries. In the 1970s and 1980s, the company sold chlorinated degreasing solvents. Another large percentage of sales involved inert materials such as diatomaceous earth, Fuller's earth, and bentonite clay. The company also marketed propylene glycol and glycerine to the hand lotion industry and primary alcohol to the printing industry.

Until 1980, Chem-Core received diatomaceous earth via a rail spur located directly west of the building. During the 1970s and until 1988, the company received bulk liquid materials at a receiving station on the north side of the building. The materials were transferred into 55 gallon drums by a gravity operated drum filling machine connected to the truck with a hose. The company had an EPA hazardous waste identification number and was classified as a RCRA small quantity generator.

There are no documented releases or disposal of hazardous waste into the subsurface at the site. It is believed that improper handling of chemicals in the past have contributed contamination to the subsurface soils at the site. Chem-Core ceased its operations at the Buffalo facility in approximately 1999. Currently, the site is unoccupied but still owned by Chem-Core, Inc.

3.2: Remedial History

A Phase I study in March 1997 and a Phase II Limited Site Investigation in June 1997 were completed for Chem-Core, Inc. The aboveground storage tank that existed at the site was removed prior to these investigations. The Phase I study included a literature survey to compile all the past activities at the site. The Phase II study involved the installation of soil borings to obtain shallow subsurface soil samples. The results from this study showed elevated levels of various volatile organic compounds (VOCs), some in exceedance of the Toxicity Characteristic for Hazardous Waste (by Toxicity Characteristic Leaching Procedure: TCLP). Due to high levels of hazardous waste described in the Phase II report, as well as Chem-Core's subsequent bankruptcy and closure in 1999, an immediate investigative work assignment (IIWA) was implemented by the NYSDEC in February 1999. This investigation involved the installation and sampling of bedrock groundwater monitoring wells and installation of deeper (approximately 20-30 feet from the surface) soil borings.

The results from these studies showed soil contamination at the site exceeding the soil cleanup goals established by the NYSDEC. Areas of highest concentrations in soil include the former tanker loading area at the north end of the building and the former PCE above-ground storage tank area inside of the loading dock area near the center of the building. Both have high levels of VOCs and are believed to be the potential sources for groundwater contamination, as contaminants are present primarily at the soil-bedrock interface.

Groundwater analyses showed that significant volatile organic compound (VOC) contamination exists in groundwater in all four monitoring wells installed previously at the site. It is evident that source contamination from the soil has traveled into the bedrock aquifer. In February 2000, the Chem-Core site was classified as a class 2 site which signifies that the contamination at the site poses a threat to human health and the environment.

SECTION 4: SITE CONTAMINATION

To evaluate the contamination present at the site and to evaluate alternatives to address the significant threat to human health and the environment posed by the presence of hazardous waste at the site, the NYSDEC has 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 two phases. The first phase was conducted between July and October 2001. The second phase was completed between December 2001 and March 2002. A report entitled, "Phase I and II RI Report," dated July 2002, has been prepared which describes the field activities and findings of the RI in detail.

The RI included the following activities:

- installation of 24 deeper soil borings and 15 monitoring wells on-site and off-site,
- analysis of soils and groundwater for chemical, physical, and hydrogeologic properties, and
- sampling of surface water and sediment samples from the Black Rock Canal to identify any impacts to the canal from the site.

To determine which media (soil, groundwater, surface water and sediment) are contaminated at levels of concern, the RI analytical data were compared to environmental SCGs. Groundwater, drinking water and surface water SCGs identified for the Chem-Core site are based on NYSDEC ambient water quality standards and guidance values and Part 5 of the New York State Sanitary Code. For soils, NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 provides soil cleanup guidelines for the protection of groundwater, background conditions, and health-based exposure scenarios. In addition, for soils, site-specific background concentration levels can be considered for certain classes of contaminants. Guidance values for evaluating contamination in sediments are provided by the NYSDEC "Technical Guidance for Screening Contaminated Sediments."

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas 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, where applicable, SCGs are provided for each medium.

4.1.1: Site Geology and Hydrogeology

The subsurface in the vicinity of the site has three layers with bedrock at the bottom, a silty clay layer above the bedrock, and a fill layer at the top. At the Chem-Core site, the thickness of the fill layer ranged from one to eight feet. The thickness of the silty clay layer ranged from 9 to 17.5 feet. The bedrock was found at depths ranging from 12.8 to 30 feet. Refer to Figure 6 for details.

The primary water-bearing unit identified at the site is the unconfined water table aquifer present in the bedrock. The groundwater table at the site was found to be at approximately 30 feet below the surface. Based on the water level data obtained during the RI, the groundwater at the site flows generally towards the Black Rock Canal. However, a southwesterly component in the groundwater flow was observed in the shallow bedrock zone. Groundwater flow in the shallow bedrock zone emanating from the site is impeded by a wedge of lacustrine silts and clays that drape over the sloping bedrock surface beneath the I-190 corridor. These confining sediments induce a southwesterly component in the groundwater flow. For this reason, the plume of dissolved groundwater contamination has migrated southwestward from the site.

4.1.2: Nature of Contamination

As described in the RI report, subsurface soil samples were collected on a 50-foot grid at the site. Monitoring wells were installed on-site and off-site to collect groundwater samples. Surface water and sediment samples were collected from Black Rock Canal. These samples were collected and analyzed to characterize the nature and extent of contamination at the site. The main categories of contaminants found at the site which exceed their SCGs are volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and inorganics (metals).

The primary contaminants found in soil and groundwater at the site were VOCs such as perchloroethene (PCE) and trichloroethene (TCE) which are classified as chlorinated hydrocarbons. These two contaminants were found at most of the sampling locations and at highest concentrations. Other VOCs were also found at the site which exceed the SCGs. SVOCs detected at the site include polycyclic aromatic hydrocarbons (PAHs). Some inorganics (metals) were also found in concentrations above the SCGs.

4.1.3:. Extent of Contamination

Tables 1 and 2 present the nature and extent of contaminants of concern (COC) in subsurface soil and groundwater and compares the data with the SCGs for the site. The following are the media which were investigated and a summary of the findings of the investigation.

Soil

A total of 64 subsurface soil samples were collected at different depths at the site. Ten (10) soil samples were collected during the Phase II investigation, ten (10) samples collected during the IIWA and forty four (44) samples collected during the RI . PCE and TCE were detected most frequently and at highest concentrations. PCE was detected as high as 38,000 ppm or milligram per kilogram (mg/kg) compared to its SCG value of 1.4 ppm and TCE was detected as high as 8 ppm or mg/kg compared to its SCG value of 0.7 ppm in the IIWA samples. In the RI samples, PCE was detected as high as 340 ppm or mg/kg and TCE was detected as high as 4 ppm or mg/kg. The highest PCE concentration was found in the IIWA sample because it is most likely that the sampling location was closer to the former PCE tank area. SVOCs were found at relatively low levels (ND-3.9 ppm or mg/kg). Figure 3 shows the locations of subsurface soil samples that had organic contaminants above the SCGs. Metals such as arsenic, beryllium, cadmium, chromium, copper, nickel, and zinc had concentrations marginally above the SCGs.

Sediments & Surface Water

Six sediment and six surface water samples were collected from the Black Rock Canal. VOCs were detected at low concentrations but were below the SCGs for sediment. SVOCs were also detected in low concentrations in comparison to the sediment guidance values except for benzo(a)pyrene at 8.5 ppm compared to its SCG value of 0.013 ppm and Aroclor 1260 at 0.34 ppm compared to its SCG value of 0.014 ppm. However, based upon the site history and groundwater data, the site does not appear to be the source of these compounds found in canal sediments.

No VOCs or SVOCs were detected in surface water. Metals were detected in surface water but were found to be below the SCGs.

Groundwater

Two rounds of groundwater samples were collected from a total of four existing wells and twelve new wells. Predominantly, VOCs such as PCE, TCE, vinyl chloride and other breakdown products of PCE were found in all well locations. PCE was found as high as 21,000 ppb or microgram per liter (ug/l) at MW-14 compared to its SCG value of 5 ppb. TCE was found as high as16,000 ppb or ug/l at PZ-1compared to its SCG value of 5 ppb. Also, break-down products such as *cis*-1,2-dichloroethene was found as high as 30,000 ppb or ug/l . Figure 4 shows the VOCs found in groundwater above SCGs. SVOCs were found to be marginally above SCGs. Metals such as iron, magnesium and thallium were found to be above SCGs. As stated in Section 4.1.1, there is a southwesterly component to the groundwater plume with elevated concentration of VOCs. The concentration of contaminants in groundwater decreases rapidly southwest of the site and approaches groundwater standards at the farthest monitoring well, MW-13.

4.2: <u>Summary of Human Exposure Pathways</u>

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the health risks can be found in Section 6.0 of the RI report.

An exposure pathway is the manner by which 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.

At this site, significant contamination exists in soil and groundwater below the building and in groundwater to the west and south of the building. For a complete exposure pathway to occur, persons would have to come into contact with subsurface soil or groundwater. Currently, these points of exposure are not complete. Homes and businesses in the area are connected to a public water supply. Contaminated soil is covered by the concrete slab of the building.

Complete pathways could occur in the future during subsurface construction activities, or by use of groundwater, or possibly by the migration of contaminated soil vapor into the building. The building is currently unoccupied. Surface water and sediment in the Black Rock Canal were not identified as media of concern for potential exposure pathways.

In summary, under the current site use scenario, the possibilities of contact with contaminated soils and groundwater are minimal and unlikely. However, under the future use scenario, there is a potential for contact with contaminated soils, groundwater and inhalation of vapors from structures.

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

This section summarizes the types of environmental exposures and ecological risks which may be presented by the site. The Fish and Wildlife Impact Assessment included in Section 6.0 of the RI report presents a more detailed discussion of the potential impacts from the site to fish and wildlife resources.

The results of the impact analysis indicate that fish in the Black Rock Canal are the only ecological resources near the site. The data obtained from the RI indicate that surface water runoff and contaminated groundwater from the site are not impacting the Black Rock canal. No contaminants of potential concern were identified in the surface water of the canal. Contaminants identified in the sediment related to the site were not found in significant concentrations and therefore, do not pose any ecological risk.

SECTION 5: <u>ENFORCEMENT STATUS</u>

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 PRP for the site, documented to date, include Chem-Core Inc., the past owner and operator of the site.

The PRP filed for bankruptcy after the company ceased all the operations at the site. The NYSDEC has implemented the RI/FS under the State Superfund. The implementation of the remedial program at the site under the State Superfund depends on the availability of funds.

SECTION 6: <u>SUMMARY OF THE REMEDIATION GOALS</u>

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 to be protective of human health and the environment. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or 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:

- provide for the attainment, to the extent practicable, of NYSDEC Class GA groundwater standards at the site,

- reduce, control or eliminate, to the extent practicable, off-site migration of groundwater that does not attain NYSDEC Class GA groundwater standards,

- reduce, control or eliminate, to the extent practicable, human exposures to volatile organic compounds in soil, groundwater or indoor air and

- reduce, control or eliminate, to the extent practicable, migration of volatile organic compounds into the Black Rock Canal.

SECTION 7: <u>SUMMARY OF THE EVALUATION OF ALTERNATIVES</u>

The selected remedy must 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 Chem-Core site were identified, screened and evaluated in the report entitled "Feasibility Study Report," dated September 2002.

A summary of the detailed analysis follows. As presented below, the time to implement reflects only the time required to construct 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 Remedial Alternatives

The potential remedies are intended to address the contaminated subsurface soils and groundwater at the site.

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

Present Worth $84,000
Capital Cost $0
O&M Present Cost $84,000
Annual O&M Cost $5,000
Time to Implement . . . . NA

Alternative 2: Monitored Natural Attenuation and Cover System

This alternative would include the installation of five new groundwater monitoring wells. The wells would be monitored to develop a fate and transport model for natural attenuation. This alternative would also involve the development and implementation of an operation, maintenance, and monitoring (OM&M) plan to monitor the groundwater. Five years of data evaluation is included to evaluate the progress of natural attenuation. Under this alternative, the building would remain in place to provide containment that would reduce the infiltration and migration of contamination from soil to groundwater and would prevent contact with subsurface contamination.

Present Worth $400,000
Capital Cost $130,000
O&M Present Cost $270,000
Annual O&M Cost $16,000
Time to Implement . . . . Three months

Alternative 3: Building Demolition, Excavation of Soil and Off-site Disposal, and Phased Approach of Groundwater Extraction and Treatment

Under this alternative, the building would be demolished and the demolition debris would be either recycled or disposed in an environmentally acceptable manner . Approximately 7600 cubic yards (cu. yds.) of contaminated soil would be excavated for off-site disposal. Based on the results from the toxicity characteristic leaching procedure and other chemical analyses, it is estimated that approximately 770 cu. yds. would not meet the land disposal criteria and would have to be transported for off-site treatment and proper disposal. Approximately 1,540 cu. yds would be disposed of in a hazardous waste landfill and 5,390 cu. yds. would be disposed of in a nonhazardous solid waste landfill. The excavated areas would be backfilled with certified clean soil.

Remediation of on-site groundwater contamination would occur in two phases for this alternative. The first phase would be conducted over a period of about five years and would involve the extraction and treatment of groundwater at the site and discharge of the treated water into the sanitary sewer. The goal would be to greatly reduce the high levels of groundwater contamination in the source area. At the end of about five years, the data will be evaluated and if favorable, the second phase of groundwater remediation would begin. The goal of the second phase treatment would be to reduce contamination to levels approaching the groundwater standards, to the extent practicable. Enhanced bio-remediation or similar technologies would be employed. If the first phase remediation of groundwater was not successful, further evaluation of alternatives would be needed.

To address the off-site groundwater contamination, a pilot scale bio-remediation study would be conducted followed by full-scale implementation of bio-remediation, if feasible.

Figures 5 and 6 show the horizontal and vertical extent of contaminated soil to be removed, respectively. Figure 7 shows the proposed plan for the extraction and treatment of on-site groundwater. Figure 8 shows the area to be utilized for the pilot study to be conducted as part of the off-site groundwater remediation.

Present Worth	$3,170,000
Capital Cost	$2,800,000
O&M Present Cost	$370,000
Annual O&M Cost	$89,000
Time to Implement	6 months

Alternative 4: Building Demolition, Soil Vapor Extraction, and Phased Approach to Groundwater Extraction and Treatment

This alternative is similar to Alternative 3 except that soil vapor extraction (SVE) technology would be utilized to remove the contaminants from the soil instead of excavation of soil and off-site disposal. The SVE technology would remove the vapors from the contaminated soil by a vacuum process and the vapors would be treated, if necessary, prior to discharging into the atmosphere. The results from the SVE pilot study conducted at the site indicated that many wells would be required for this technology to be effective. This is because of the existing soil conditions at the site. For this reason, the capital cost to implement this technology would be high.

The on-site and off-site groundwater contamination would be addressed as described in Alternative 3.

Present Worth	$3,400,000
Capital Cost	$2,100,000
O&M Present Cost	$1,300,000
Annual O&M Cost	$310,000
Time to Implement	6 months

Alternative 5: Soil Vapor Extraction, and Phased Approach of Groundwater Extraction and Treatment

This alternative is similar to Alternative 4 except that the existing building would not be demolished.

Present Worth	$3,300,000
Capital Cost	$2,000,000
O&M Present Cost	$1,300,000
Annual O&M Cost	$310,000
Time to Implement	6 months

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 (6 NYCRR Part 375). For each of the criteria, a brief description is provided, followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is included 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 major SCGs applicable for this site include groundwater quality standards in 6 NYCRR Part 703, NYSDEC guidance for soil clean up goals (Technical and Administrative Guidance Memorandum (TAGM) No. 4046), land disposal regulations, and air quality standards. The discharge of treated groundwater into the sanitary sewer system have to meet the requirements of the Buffalo Sewer Authority.

Alternative 1 would not meet SCGs. Alternative 2 would not meet the SCGs for soil but would prevent exposures by containing the contaminated soil under the concrete slab and would mitigate the further migration of contamination from soil into the groundwater. Alternative 3 would have the highest level of compliance with soil SCGs because it includes direct removal. Alternatives 4 and 5 would produce similar results compared to each other but would take much longer than Alternative 3.

It would take a very long time to achieve groundwater SCGs for Alternative 2 due to the very high existing concentrations. Alternatives 3-5 would produce similar results for groundwater but Alternative 3 would have a somewhat greater ability to achieve SCGs due to a higher degree of soil remediation. The existing soil conditions at the site would make achieving SCGs for soil more difficult for SVE (Alternatives 4 and 5) than soil excavation (Alternative 3).

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

Alternative 1 would not be protective of human health and the environment. Alternative 2 would comply (marginally) with this criterion but to a much lesser degree than Alternatives 3-5 because contaminated soil would remain at the site. Alternatives 3-5 would be protective of human health and the environment but Alternative 3 would be more effective than other alternatives because the source of contamination would be completely removed from the site. As stated earlier, the existing soil conditions at the site would make achieving SCGs for soil more difficult for SVE (Alternatives 4 and 5) than soil excavation (Alternative 3).

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.

There would be no short-term impacts, under Alternative 1, because there would be no construction activities. Under Alternative 2, there would be essentially no short-term impacts since the only invasive activities would be the installation of additional monitoring wells. Alternative 3 would pose greater short-term impacts compared to Alternatives 4 and 5 because of the excavation and transportation of contaminated soil. Building demolition (Alternatives 3 and 4) could create short-term impacts from the generation of dust. A site-specific health and safety plan that would include engineering controls such as air monitoring and dust suppression measures would be implemented to protect the workers and the community.

Alternative 1 would not have any short-term effectiveness. Soil clean up goals would not be achieved under Alternative 2. Alternative 3 would require less time to achieve soil cleanup goals compared to Alternatives 4 and 5. For achieving groundwater goals, Alternatives 3, 4 and 5 would need less time compared to Alternative 2.

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.

Alternative 1 has no long-term effectiveness because all the contaminated soil and groundwater would remain on-site and risks would not change. Under Alternative 2, long-term effectiveness for soil would be dependant upon using the existing building and floor slab as a "cover system." The long-term effectiveness would be very low for groundwater under Alternative 2 because of the very long time needed to achieve the remedial goals. Alternative 3 would have greater long-term effectiveness compared to Alternatives 4 and 5 due to the complete removal of contaminated soil from the site and the better performance of excavation over SVE due to site-specific conditions. The long-term effectiveness for groundwater would be appreciably higher for Alternatives 3, 4, and 5 compared to Alternative 2.

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 not reduce toxicity, mobility, or volume. Under Alternative 2, the mobility of the contamination in soil would be controlled but not toxicity or volume. The soil removal under Alternative 3 would effectively reduce toxicity, mobility and volume. The soil treatment under Alternatives 4 and 5 would reduce toxicity, mobility and volume but to a lesser degree compared to Alternative 3. This is because the existing soil conditions at the site would make achieving SCGs for soil more difficult for SVE (Alternatives 4 and 5) than soil excavation (Alternative 3).

Groundwater remediation under Alternatives 3, 4 and 5 would reduce the toxicity, mobility and volume in a lesser period of time compared to Alternative 2.

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 materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc.

Alternative 1 would be easiest to implement since no construction is involved. Alternative 2 would involve the installation of monitoring wells and would be easy to implement. Although Alternative 3 would involve more construction activities, it is technically implementable with many experienced contractors available. Demolition and soil removal would be difficult but manageable due to the limited space available at the site. Alternatives 4 and 5 would require more engineering design for the SVE system but are both implementable.

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. Alternative 1 is the least expensive with a total present worth of $84,000 and Alternative 4 is the most expensive at $3,400,000.

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

8. Community Acceptance. Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan have been evaluated. The responsiveness summary (Appendix A) presents the public comments received and the manner in which the NYSDEC addressed the concerns raised. In general, the public comments received during the public meeting held on December 5, 2002 were supportive of the selected remedy.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based on the Administrative Record (Appendix B) and the discussion presented below, the NYSDEC has selected Alternative 3 as the remedy for this site. The elements of the remedy are described at the end of this section. The selected remedy is based on the results of the RI and the evaluation of alternatives presented in the FS.

This selection is based on the evaluation of the five alternatives developed for this site. With the exception of the No Action alternative, each of the alternatives would comply with the threshold criteria (compliance by Alternative 2 would be marginal). In addition, all four alternatives would comply with the balancing criteria but the level of compliance varies for each alternative. The major differences between the four alternatives are overall effectiveness and cost. Essentially, Alternative 3 provides the greatest certainty of achieving the remediation goals for the site and is cost-effective.

Alternative 2 (monitored natural attenuation with containment) is the lowest in cost compared to Alternatives 3, 4, and 5 but the soil cleanup goals would not likely be achieved under Alternative 2. Groundwater goals would not likely be achieved in a reasonable amount of time. Alternative 3 is the only alternative that would remove soil from the ground for off-site disposal. Alternative 3 will provide for the removal of the source materials from the ground, allowing a visual and analytical inspection to ensure that all of the soils containing contaminants of concern in excess of the proposed remedial goals will be removed for off-site disposal. It is also lower in cost compared to Alternatives 4 and 5.

The results of the SVE pilot test show that due to problems with subsurface conditions, SVE (Alternatives 4 and 5) would not likely remediate soil as well as Alternative 3. Alternatives 2, 4, and 5 would require the implementation of additional studies to collect data necessary to properly design full scale systems for the site.

Figures 5-8 shows the details of Alternative 3 such as the extent of contaminated soil removal and the proposed plan for the remediation of groundwater.

The estimated present worth cost to implement the remedy is $3,170,000. The cost to construct the remedy is estimated to be $2,800,000 and the estimated present worth cost of operation and maintenance is $370,000.

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.

2. Demolish the building and dispose of the demolition debris off-site in a permitted facility.

3. Excavate the contaminated subsurface soil (approximately 7,600 cubic yards) and dispose of the soil in off-site permitted facilities. Confirmatory samples will be collected and analyzed to determine whether the clean up goals have been achieved. The excavated areas will be backfilled with certified clean soil. The goal is to excavate the soils to TAGM levels to the extent practicable.

4. Install monitoring wells and groundwater recovery wells at the site to extract the contaminated groundwater.

5. Install a treatment system at the site to treat the extracted groundwater for disposal into the sanitary sewer system.

6. Operate the groundwater extraction and treatment system for about five years and evaluate the results. If concentrations have been reduced sufficiently, implement enhanced bioremediation or other available technology to achieve groundwater standards to the extent practicable.

7. Implement a bioremediation pilot study for off-site groundwater contamination. This will occur during construction of the remedy. Based on the results from the pilot study, implement a full-scale remediation of off-site groundwater, if necessary.

8. Implement a long-term operation, maintenance, and monitoring program for the groundwater extraction and treatment system.

9. A notification will be sent to the county clerk for filing, to notify future owners of the site about the presence of residual contamination remaining in groundwater.

SECTION 9: <u>HIGHLIGHTS OF COMMUNITY PARTICIPATION</u>

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

- Repositories for documents pertaining to the site were established.
- A public contact list, which included nearby property owners, elected officials, local media and other interested parties, was established.
- A fact sheet was mailed in August 2001 providing the current status of the investigation to be conducted at the site.
- A fact sheet and a public meeting notice was mailed in November 2002 providing the results of the investigation and the proposed remedial action plan for the site.
- A public meeting was held on December 5, 2002 to present and receive comment on the PRAP.
- A responsiveness summary (Appendix A) was prepared to address the comments received during the public comment period for the PRAP.

Table 1
Nature and Extent of Contamination
Subsurface Soil

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppm)	FREQUENCY of EXCEEDING SCGs/Background	SCG/ Bkgd. (ppm)
Soils	Volatile Organic Compounds (VOCs)	Tetrachloroethene	0.001 to 38,000	16 of 64	1.4
		Methylene Chloride	0.004 to 160	3 of 64	0.1
		1,1-Dichloroethane	0.001 to 1.0	1 of 64	0.2
		1,1-Dichloroethene	0.001 to 0.65	1 of 64	0.4
		Acetone	0.004 to 2.4	5 of 64	0.2
		cis-1,2-Dichloroethene	0.001 to 3.2	5 of 64	0.2
		Trichloroethene	0.002 to 8.0	14 of 64	0.7
		1,1,1,-Trichloroethane	0.002 to 3.1	1 of 64	0.8
Soils	Semi-Volatile Organic Compounds (SVOCs)	Benzo(a)anthracene	ND to 2.9	2 of 4	0.224
		Benzo(a) pyrene	ND to 2.8	2 of 4	0.61
		Chrysene	ND to 2.7	2 of 4	0.4
		Benzo(b)fluoranthene	ND to 3.9	1 of 4	1.1
		Benzo(k)fluoranthene	ND to 1.3	1 of 4	1.1
		Dibenz(a,h)anthracene	ND to 0.3	1 of 4	0.014
Soils	Inorganic Compounds (Metals)	Beryllium	0.33 to 0.86	4 of 4	0.16
		Chromium	11.3 to 24.1	4 of 4	10
		Zinc	62 to 104	4 of 4	20
		Nickel	11.9 to 34.5	3 of 4	13
		Copper	11.5 to 29.3	1 of 4	25
		Arsenic	1.1 to 7.8	1 of 4	7.5
		Cadmium	0.4 to 1.1	1 of 4	0.16

Table 2
Nature and Extent of Contamination
Groundwater

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppb)	FREQUENCY of EXCEEDING SCGs/Background	SCG/ Bkgd. (ppb)
Groundwater	Volatile Organic Compounds (VOCs)	Acetone	ND to 1,000	1 of 19	50.0
		Methylene Chloride	ND to 3,000	2 of 19	5.0
		Toluene	ND to 2,200	2 of 19	5.0
		Benzene	ND to 52	3 of 19	1.0
		1,1-Dichloroethane	ND to 4,500	9 of 19	5.0
		1,1-Dichloroethene	ND to 1,400	9 of 19	0.7
		Vinyl Chloride	ND to 9,300	9 0f 19	2.0
		Tetrachloroethene	ND to 21,000	10 of 19	5.0
		1,1,1,-Trichloroethane	ND to 25,000	10 of 19	5.0
		Trichloroethene	ND to 16,000	11 of 19	5.0
		cis-1,2-Dichloroethene	ND to 30,000	15 of 19	5.0
Groundwater	Semi-Volatile Organic Compounds (SVOCs)	2-Methylphenol	ND to 3	1 of 5	1
		4-Methylphenol	ND to 3	1 of 5	1
		bis(2-ethylhexyl)phthalate	7 to 14	3 of 5	5
Groundwater	Inorganic Compounds (Metals)	Iron	60.3 to 17,000	5 of 5	300
		Magnesium	17,200 to 126,000	4 of 5	35000
		Thallium	ND to 11.4	2 of 5	0.5

Table 3
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual O&M Cost	O&M Capital Cost	Total Present Worth
1. No Action	$0	$5,000	$84,000	$84,000
2. Monitored Natural Attenuation and Cover System	$130,000	$16,000	$270,000	$400,000
3. Building Demolition, Excavation, off-site disposal, groundwater extraction and treatment	$2,800,000	$89,000	$370,000	$3,170,000
4. Building Demolition, SVE, groundwater extraction and treatment	$2,100,000	$310,000	$1,300,000	$3,400,000
5. SVE, groundwater extraction and treatment	$2,000,000	$310,000	$1,300,000	$3,300,000

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Chem-Core Site
City of Buffalo, Erie County, New York
Site No. 9-15-176

The Proposed Remedial Action Plan (PRAP) for the Chem-Core site, was prepared by the New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on November 25, 2002. The PRAP outlined the remedial measure proposed for the contaminated subsurface soils and groundwater at the Chem-Core site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on December 5, 2002, which included a presentation of the Remedial Investigation (RI) and the Feasibility Study (FS) as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. No written comments were received during the public comment period. The public comment period for the PRAP ended on December 23, 2002.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the NYSDEC's responses:

Comment 1: What is a Class 2 site?

Response 1: The Class 2 designation is given to sites which pose a significant threat to public health or the environment and remedial action is required to address the contamination found at the site.

Comment 2: What is PCE?

Response 2: Perchloroethene (PCE), also known as tetrachloroethene, is a manufactured chemical that is widely used for dry cleaning of fabrics and for some metal-degreasing.

Comment 3: What is bioremediation?

Response 3: Bioremediation is a technology that encourages growth and reproduction of indigenous microorganisms to enhance the biodegradation of contaminants in groundwater and saturated soils. Bioremediation can effectively degrade organic constituents including chlorinated solvents which are dissolved in groundwater. Bioremediation generally requires an injection system to deliver the nutrients to the affected media.

Comment 4: What is the depth to bedrock?

Response 4: Based on the data obtained from the investigation, the depth to bedrock at the site ranges from approximately 13 feet to 30 feet below the ground surface.

Comment 5: How did contamination get into soil? How did the PCE get under the concrete slab?

Response 5: There are no documented releases of chemicals to the soil at the site. We believe that PCE was released into the soil through spills into floor drains and floor cracks and perhaps from releases from piping used for the transfer of chemicals.

Comment 6: What was the level of contamination in well MW-5? What was the level of contamination in the well by Great Lakes Steel? What are the contaminants found in soil between the two buildings - the parking lot area? Will the State excavate all the soil down to the bedrock?

Response 6: No site-related contaminants were found in the MW-5 well cluster located upgradient of the site. Two shallow wells and one deep well are located in the gravel parking lot at the site. Great Lakes Steel is located north of the parking lot. The wells located in the parking lot were found to be contaminated above groundwater standards with PCE and other breakdown products of PCE. The subsurface soil in the parking lot, from approximately six feet below the ground surface down to the bedrock, was found to be contaminated with PCE and semi-volatile organic compounds classified as polycyclic aromatic hydrocarbons (PAHs). The proposed remedy includes the excavation of contaminated soil down to the bedrock and off-site disposal.

Comment 7: Where will the new pumping system wells be located? Will the extraction system use the same wells used for monitoring? Will the groundwater extraction system interfere with the future use of this site?

Response 7: The groundwater pumping wells would be located in areas where significant contamination in groundwater was found. Figure 7 in the PRAP shows the approximate location of the pumping wells. The monitoring wells installed during the investigation will not be used for collecting groundwater because the monitoring wells are smaller diameter wells and would not be suitable for pumping operations. New larger diameter wells will be installed to pump the contaminated groundwater. The groundwater pumping wells would not necessarily interfere with future development at the site. Based on the need for future development, an appropriate location could be identified to set up the groundwater treatment system.

Comment 8: What is the cost of proposed remedy? Do you have a breakout of the cost for the various parts of the remediation?

Response 8: It would cost approximately $3.2 million to implement the proposed remedy at the site. The feasibility study (FS) report prepared for the site has the cost breakdown for the proposed remedy. The FS report can be reviewed at the DEC's Buffalo office located at 270 Michigan Avenue. Please call Mr. Maurice Moore at 716-851-7220 to make an appointment to review the report.

Comment 9: When will the ROD be issued? When will construction start? Will this be held up by the Superfund issues?

Response 9: The Record of Decision (ROD) for the site should be issued in January 2003. The schedule for construction depends on the availability of funds in the Superfund program. If funds are available after the completion of the ROD, the design of the remedy would take approximately 12 months and the construction would start in early 2004. Currently, funds are not appropriated for the implementation of the proposed remedy at the site. The remediation work at the Chem-Core site could be delayed because of the unavailability of funds.

Comment 10: Who owned the property? Does the State of New York own the site? Will the state own the property while the remediation is underway?

Response 10: Chem-Core Inc. was the past owner and operator of the site. The State of New York does not own the site and will not own the site to implement the proposed remedy.

Comment 11: Are there any other sites in Erie County that have a PCE problem?

Response 11: Yes, there are other sites in Erie County with PCE contamination problem. Mr. Paul Kranz of Erie County Department of Environment and Planning who was present at the meeting offered to provide this information to interested citizens.

APPENDIX B

Administrative Record

Administrative Record

Chem-Core Site
Site No. 9-15-176

1. "Phase I Environmental Site Assessment", March 1997, prepared by Maxim Technologies of New York, Inc.

2. "Phase II Limited Site Investigation", June 1997, prepared by Maxim Technologies of New York, Inc.

3. "Report on Activities under the Immediate Investigation Assignment", August 1999, prepared by the NYSDEC.

4. "Limited Indoor Air Quality Investigation and Asbestos Sampling and Analysis Report", September 2000, prepared by Chopra-Lee, Inc.

5. "Remedial Investigation/Feasibility Study Work Plan", May 2001, prepared by URS Corporation.

6. "Phase I and II Remedial Investigation Report", May 2002, prepared by URS Corporation.

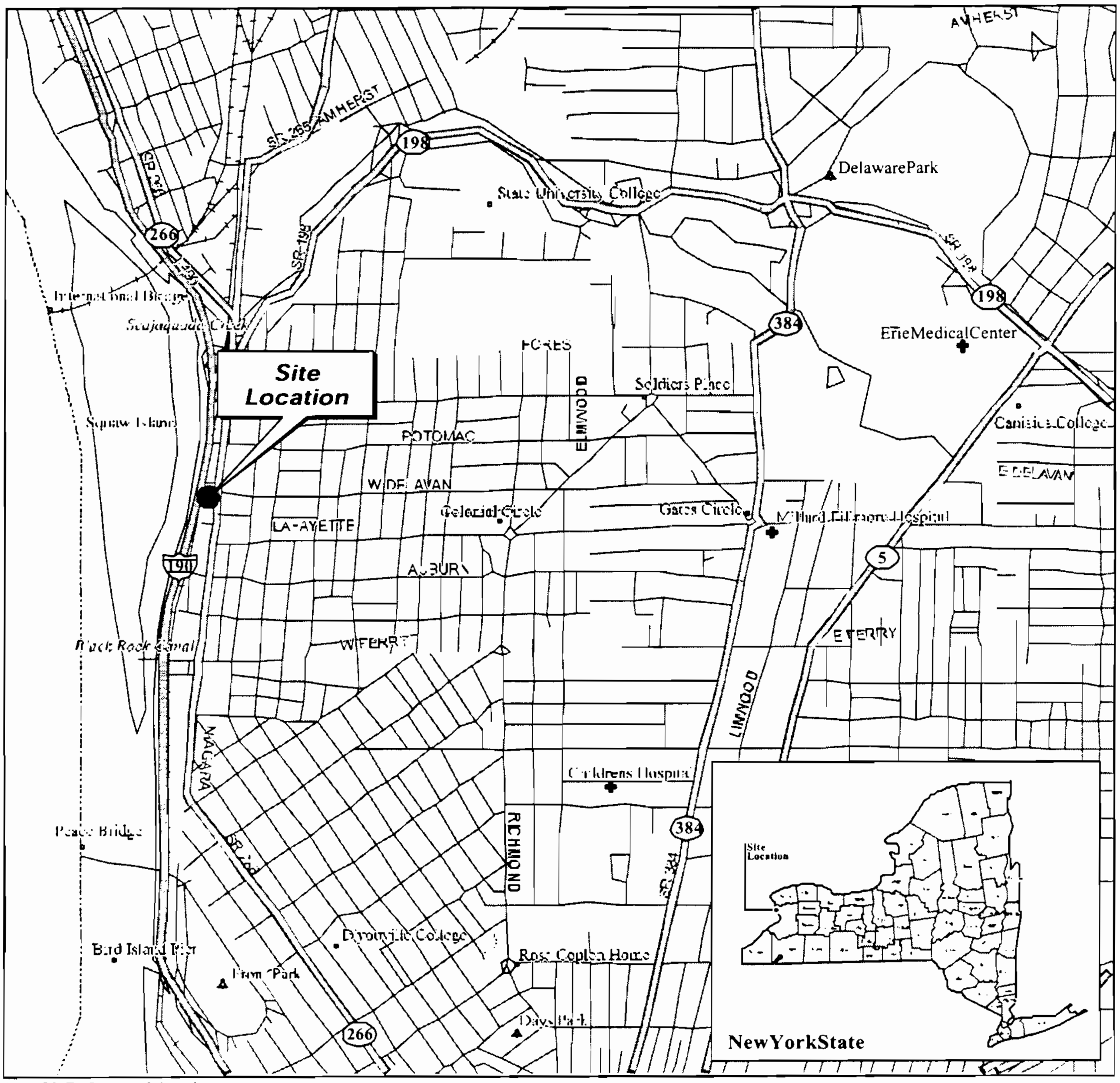
7. "Pilot Study Report", June 2002, prepared by URS Corporation.

8. "Data Usability Summary Report", July 2002, prepared by URS Corporation.

9. "Feasibility Study Report", November 2002, prepared by URS Corporation.

10. Proposed Remedial Action Plan for the Chem-Core site, dated November 2002, prepared by the NYSDEC.

11. Record of Decision for the Chem-Core Site, dated January, 2003, prepared by the NYSDEC.



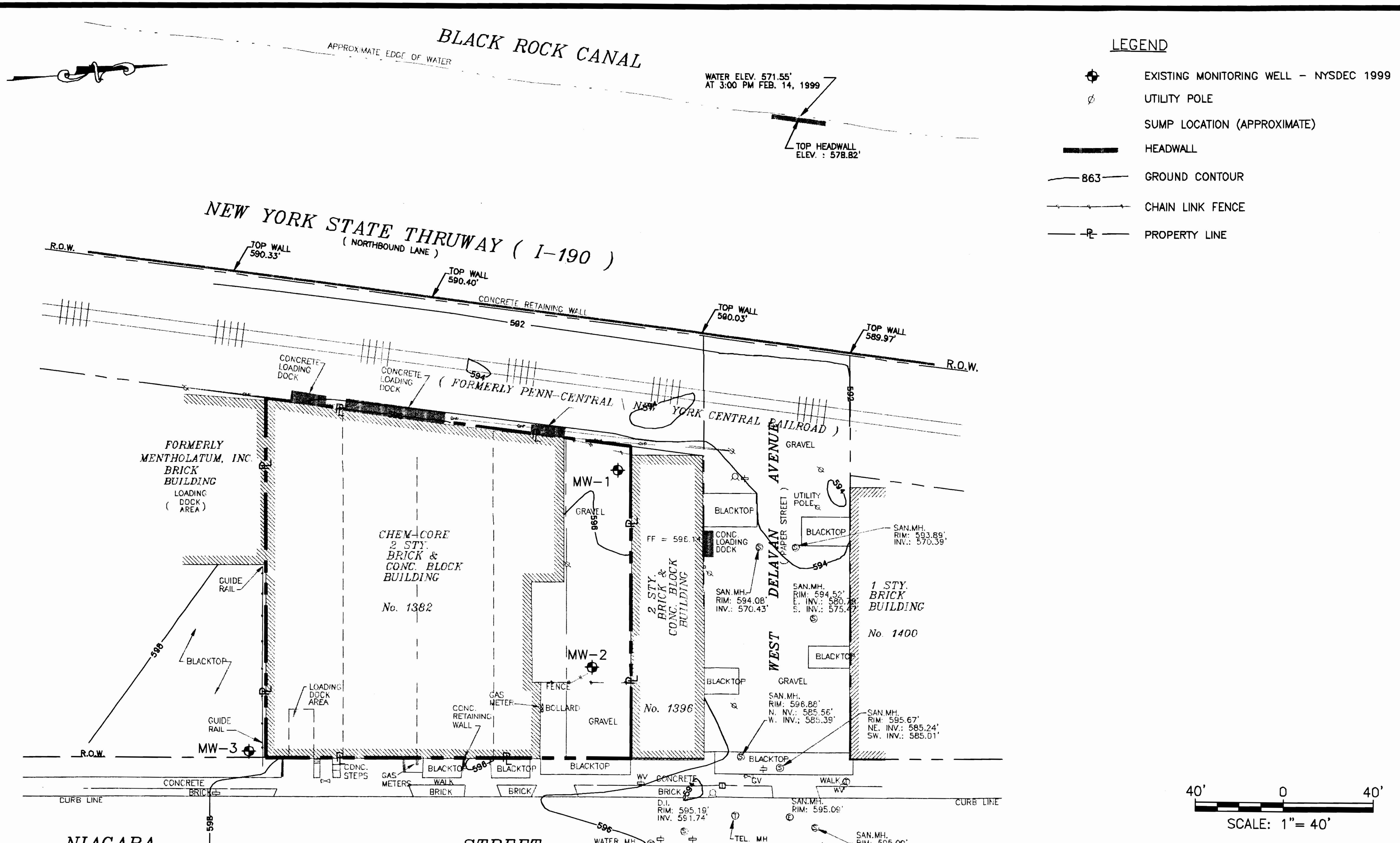
APPROXIMATE SCALE IN FEET

2500 0 2500

URS

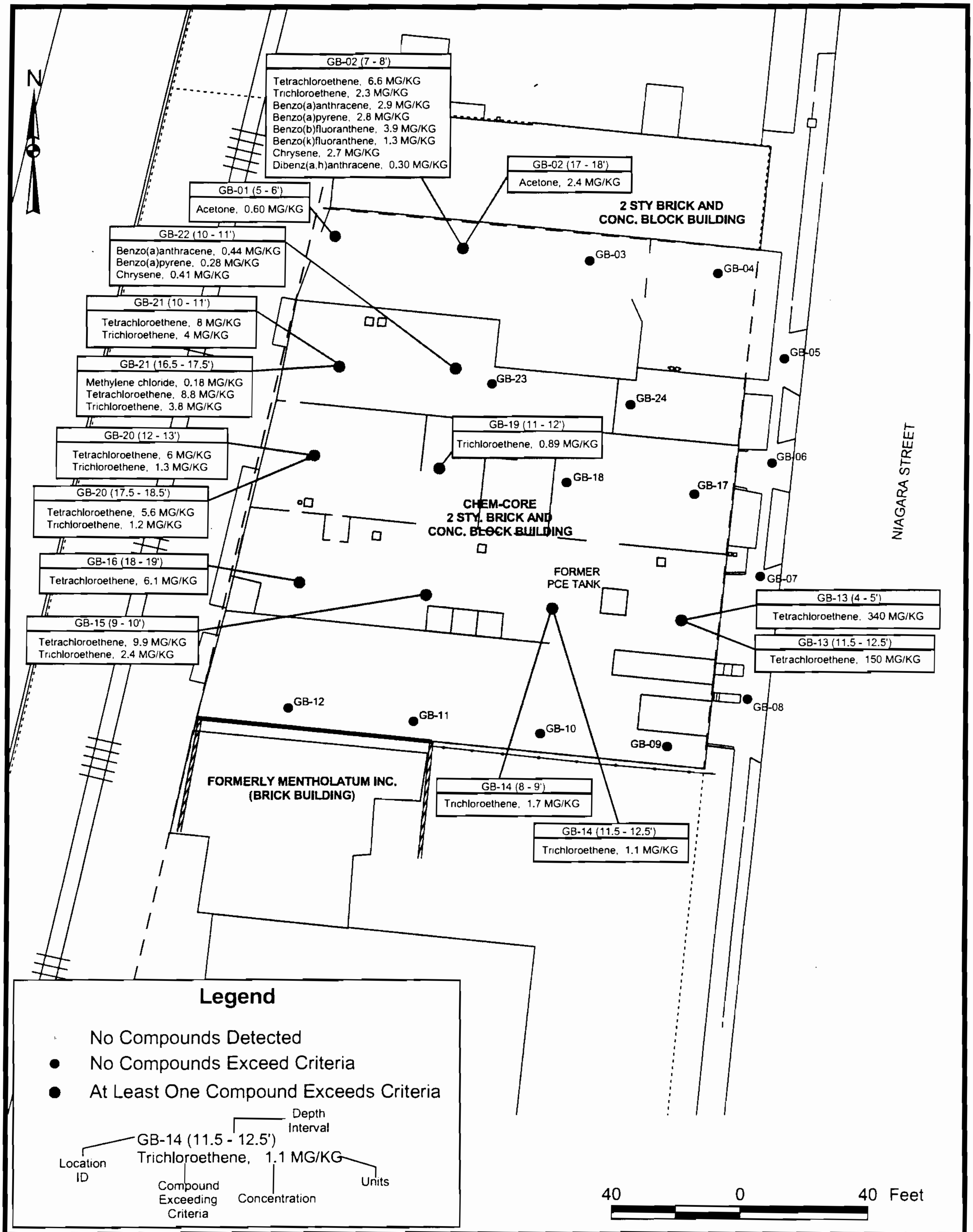
CHEM-CORE FACILITY
SITE LOCATION MAP

FIGURE 1



SITE PLAN

URS | FIGURE 2



35890.00\GIS\chemical.apr (MG/KG) 2001 RI SOIL EXCEEDANCES

0/29/2002

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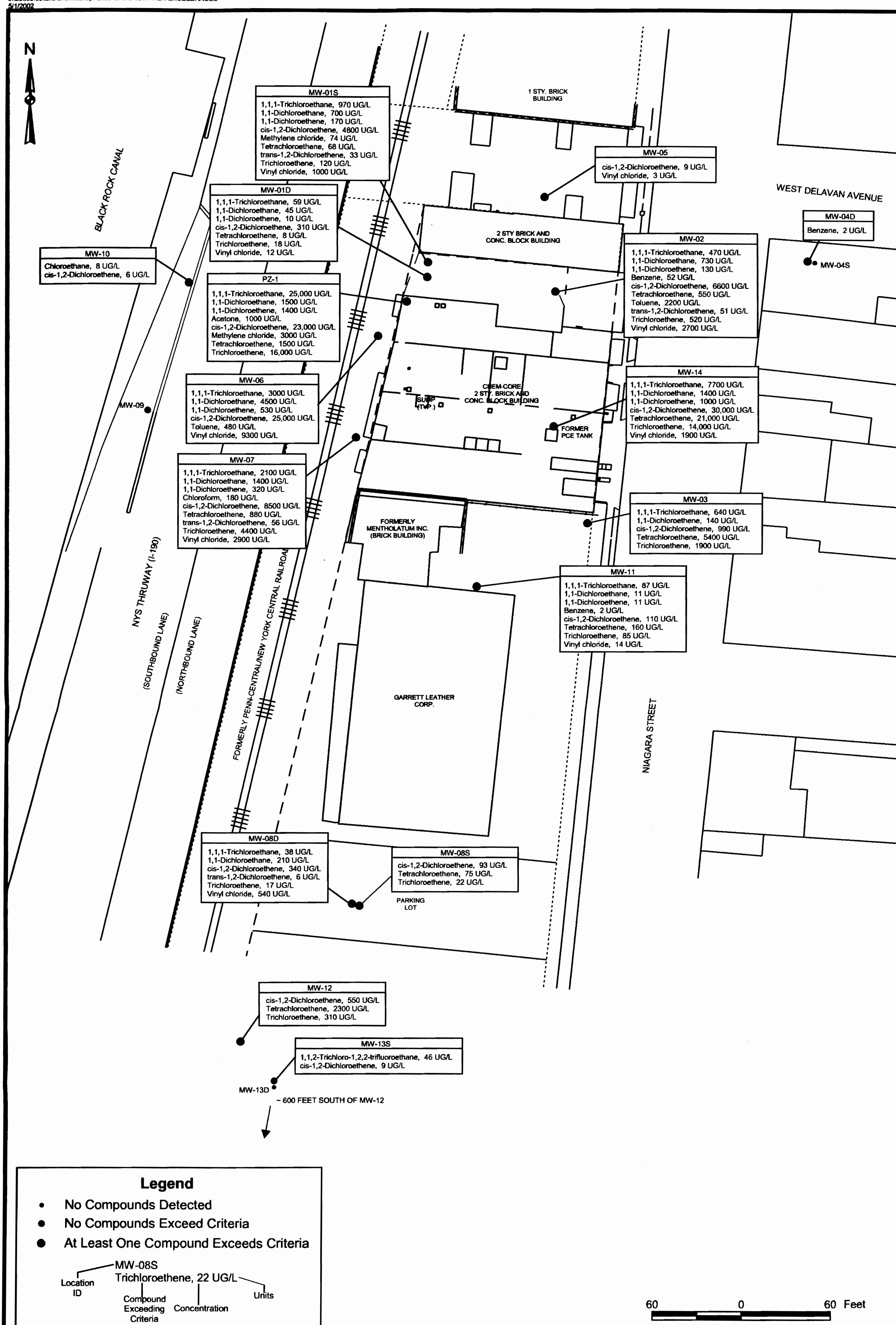
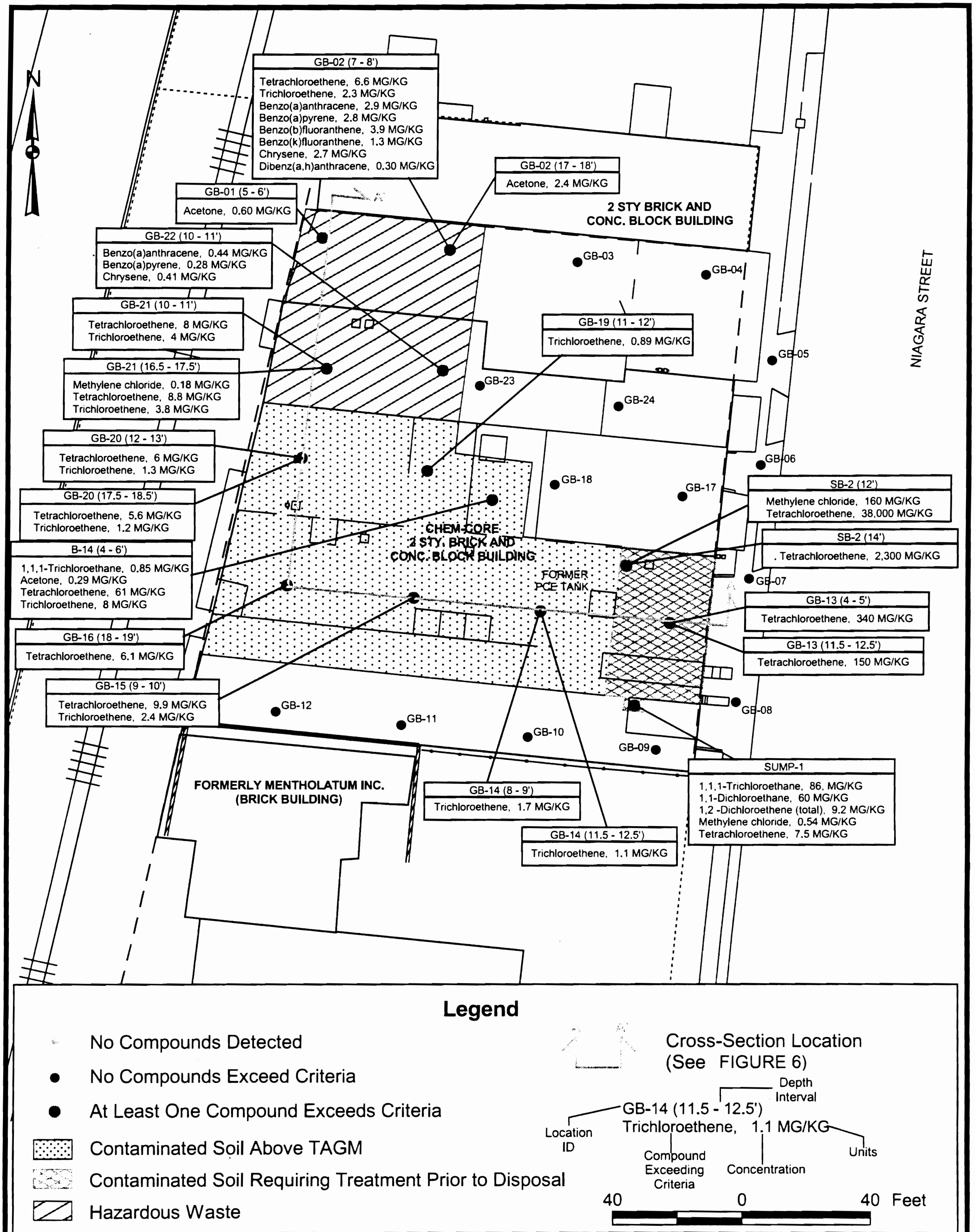
CHEM CORE
SOIL CONTAMINANTS ABOVE SCGs (2001)

FIGURE 3

J:\35890.00\GIS\chemical.apr 2002 GROUNDWATER EXCEEDANCES
5/1/2002



URS	CHEM CORE GROUNDWATER CONTAMINANTS ABOVE SCGs (2002)	FIGURE 4



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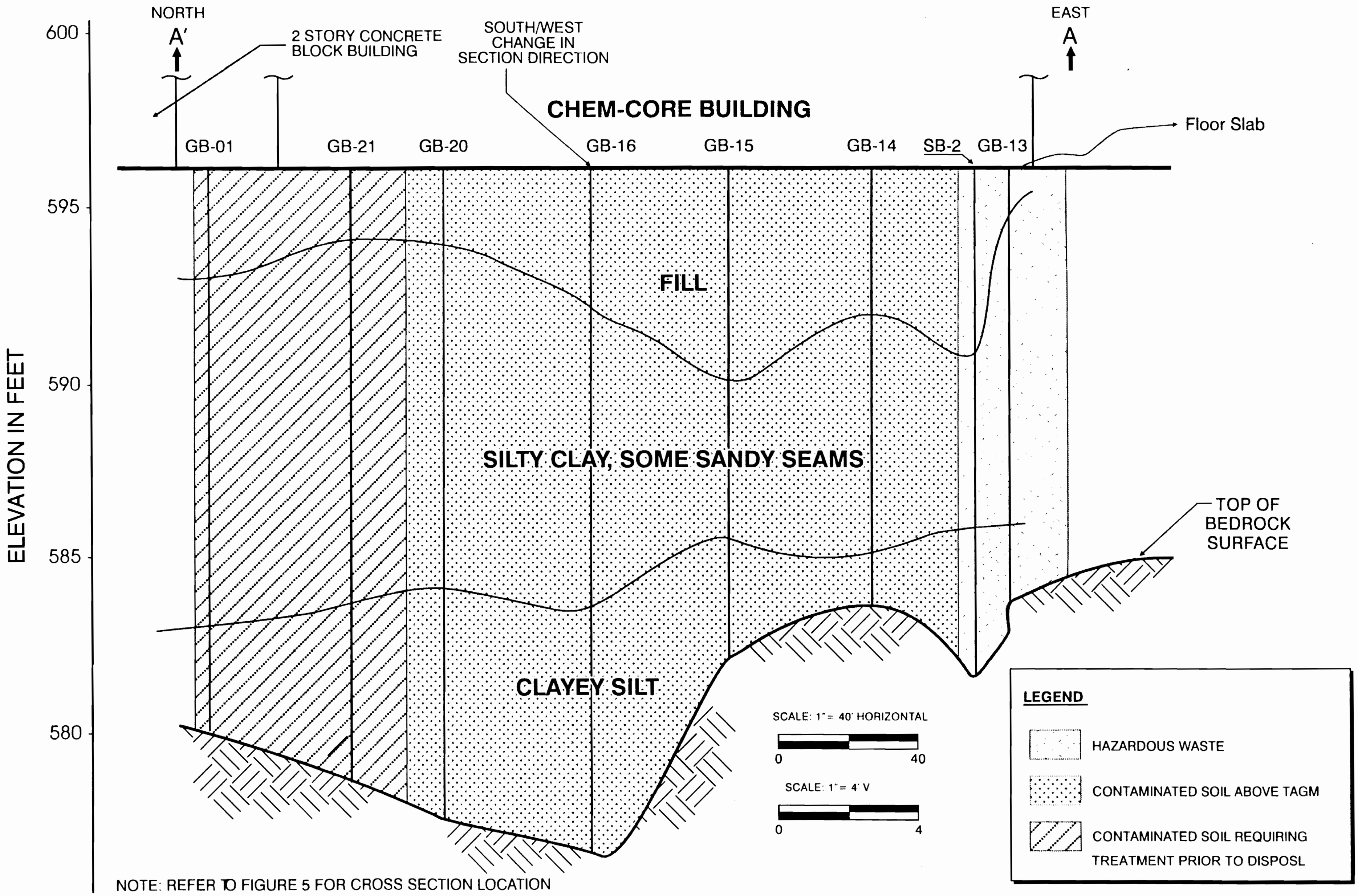
CHEM CORE
CONTAMINATED SOIL

FIGURE 5

J:\35890.00\GIS\chemical.apr (MG/KG 1-6) CONTAMINATED SOIL
10/29/2002

AG17714-35890.00-080902-CYT



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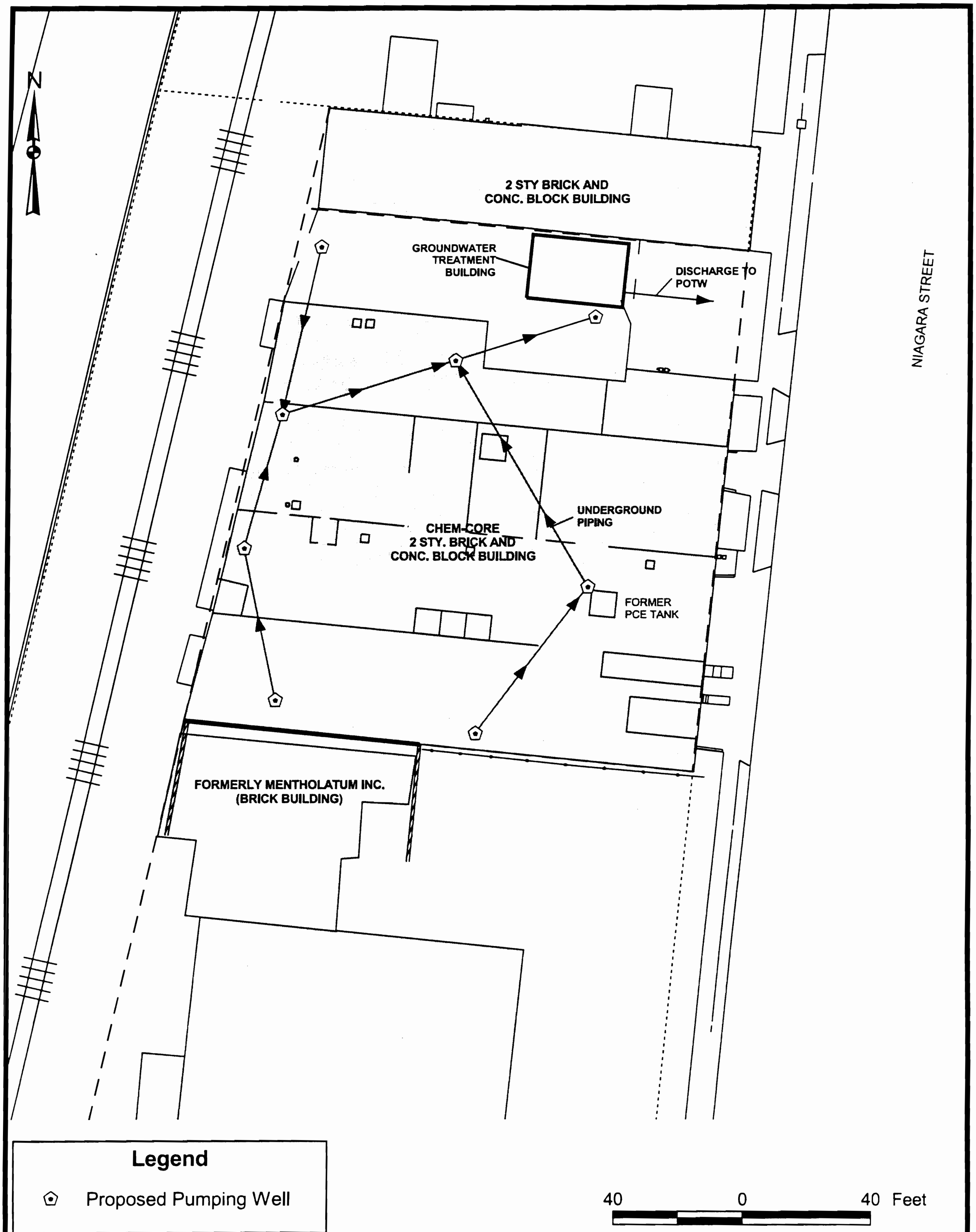
CHEM CORE(A-A') CROSS SECTION

FIGURE 6



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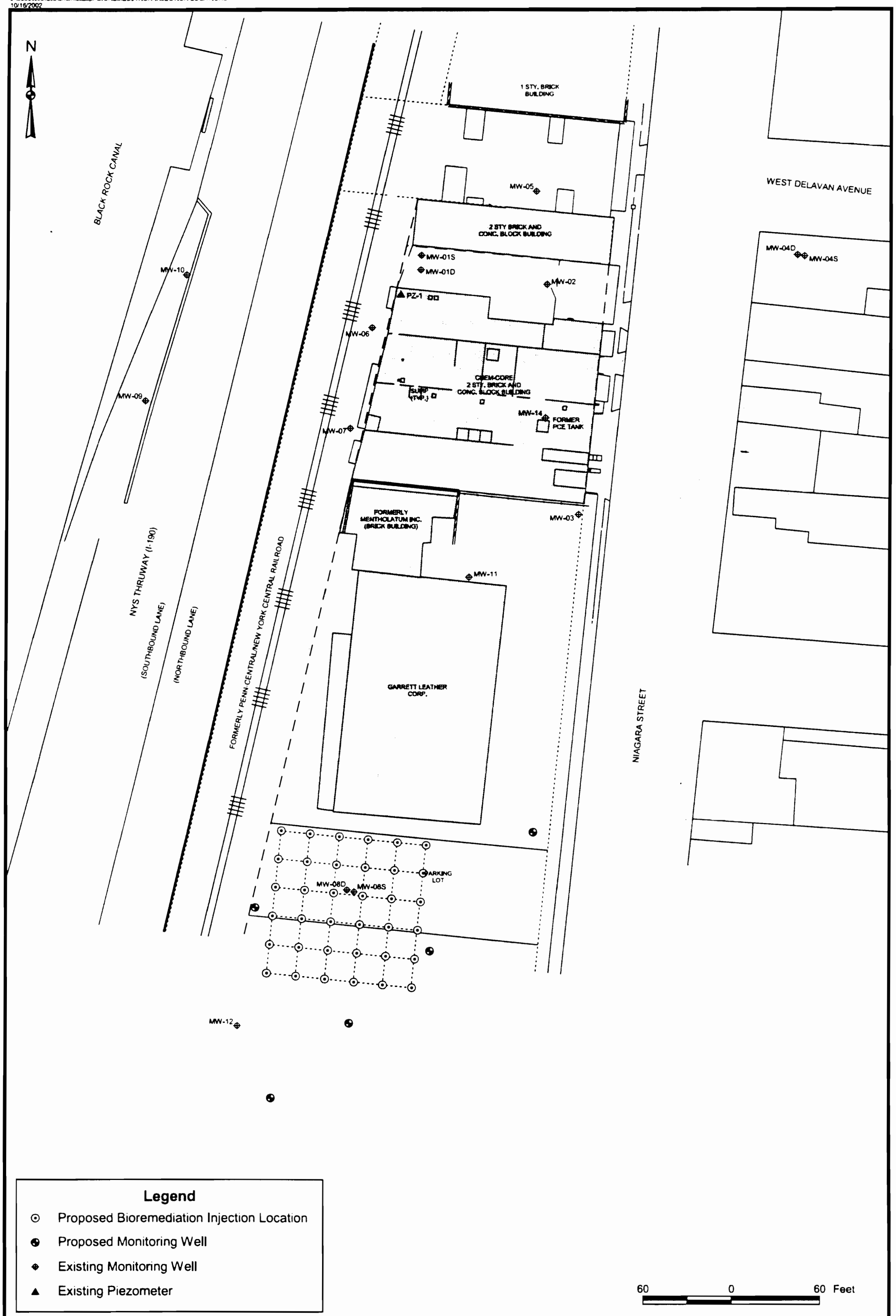
CHEM CORE
CONCEPTUAL GROUNDWATER
EXTRACTION/TREATMENT SYSTEM

FIGURE 7

35890.00\GIS\chemical.apr CONCEPTUAL GROUNDWATER EXTRACTION SYSTEM
0/16/2002

J:\35890.00\GIS\chemical.apr BIOREMEDIATION INJECTION LOCATIONS
10/16/2002



URS	CHEM CORE CONCEPTUAL GROUNDWATER PILOT TEST PLAN FOR IN-SITU BIOREMEDIATION	**FIGURE 8**