SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT

Chicago Pneumatic Tool Company
Frankfort, New York

March 1995
Final December 1995

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SECTION 1.0 INTRODUCTION

1.1 Background and Objectives

An Administrative Order on Consent (Index No. A6-0279-92-04) was issued by the New York State Department of Environmental Conservation (NYSDEC), Region 6 effective October 26, 1993, for the Chicago Pneumatic Tool Company site (Chicago Pneumatic Site) in Frankfort, New York. This order required the implementation of a Remedial Investigation/Feasibility Study (RI/FS) to further characterize the human health and environmental risks associated with potential source areas identified at the site and to identify appropriate remedial actions to mitigate any potential risks. This site is listed in the New York State Registry of Inactive Hazardous Waste Sites as Site No. 622003; it is a Class 2 site.

On behalf of the respondent, Blasland, Bouck & Lee, Inc. (BB&L) prepared a final RI/FS Work Plan, which was approved by the NYSDEC in August 1993 (BB&L, August 1993). This Work Plan describes the work efforts to be completed during the implementation of the RI/FS, and is supported by two other documents; the Sampling and Analysis Plan (SAP) and the Health and Safety Plan (HASP). The SAP is comprised of two documents: the Field Sampling Plan (FSP), and the Quality Assurance Project Plan (QAPP). The FSP contains detailed procedures that were followed during implementation of the RI field activities. The QAPP contains the quality assurance/quality control (QA/QC) procedures necessary to achieve the data quality objectives (DQOs), as set forth in the RI/FS Work Plan. The HASP contains plans and procedures that were followed during the RI field activities for on-site worker health and safety.

The overall objective of the RI was to collect sufficient data to clarify and supplement the database developed during the Environmental Assessment conducted between 1988 and 1991 so that the baseline Risk Assessment (RA) and FS could be completed.

The specific RI/FS objectives were to:

1. Characterize and delineate potential source areas to quantify waste and impacted media (i.e., soil, sediment, surface water, and ground water);

2. Determine the risk, if any, to human health and the environment from the identified chemical constituents present in the environmental media;

3. Determine whether remedial action is appropriate and feasible at any identified source area and/or for site ground water. Evaluate remedial alternatives and determine the need for treatability studies, as appropriate; and

4. Identify and develop a detailed analysis of potential remedial alternatives for those areas in which remedial action is determined appropriate.

The initial RI was conducted between October 1993 and April 1994. The results (of the initial RI) are summarized in a final RI Report prepared by BB&L (October 1994), which includes a baseline Risk Assessment, and recommendations for an Interim Remedial Measure (IRM) and Supplemental RI activities. The RI Report was approved by the NYSDEC on December 13, 1994.

A Supplemental RI Work Plan dated December 1994 was prepared by BB&L and approved by the NYSDEC in December 1994, to address the few remaining data gaps that existed in the RI in order to complete the FS and to set forth the technical scope of work for the implementation of the Supplemental RI activities. The Supplemental RI activities were completed between November 1994 and January 1995. The Supplemental RI was performed in accordance with the NYSDEC-approved QAPP, SAP, and HASP (BB&L, August 1994) utilized in the initial RI.

The following activities were performed to address data gaps during the Supplemental RI:

- **Further assess soil quality in the vicinity of monitoring well MW-5 in the East Lot;**
- Determine the vertical extent of impacted till beneath the former chip chute area;
- Further assess the extent of impacted sediment/soil in the unnamed creek west of the site and the drainage ditches (on site and off site);
- Assess potential impacted soil and ground water beneath the manufacturing building;
- Characterize soil quality within the skimmer pond;
- Further assess the top of bedrock ground-water quality;
- Assess ground-water quality in two residential water supply wells located east of the site;
- Perform additional ground-water sampling at selected monitoring wells;
- Perform supplemental hydrogeologic investigations to delineate constituents in the shallow ground-water system north of the manufacturing building; and

- Evaluate site utilities as pathways for constituent migration.

Subsequent to the submittal of the draft Supplemental RI Report and draft FS Report (March 1995), comments from the NYSDEC and NYSDOH were presented in a letter dated May 3, 1995. Response to the comments were prepared and submitted to the NYSDEC and NYSDOH in a letter from BBL dated June 29, 1995. A meeting was held between the NYSDEC, NYSDOH, Chicago Pneumatic Tool Company, and BBL on August 18, 1995 to discuss two remaining RI data gaps and other FS issues. A letter from BBL to the NYSDEC dated September 15, 1995 outlined the resolutions to address the RI data gaps and FS issues. With respect to the RI, an Addendum to the Supplemental RI Work Plan was proposed to address the two remaining data gaps. The Addendum to the Supplemental RI field work was performed in October 1995 and the results were transmitted to the NYSDEC in a letter report dated November 1995.

The two RI data gaps addressed in the Addendum to the Supplemental RI Work Plan were as follows:

- **Determine if soil in the East Lot is the source of VOCs and PCBs detected in monitoring well MW-5; and**

- **Further assess the ground-water quality in the northwest corner of the site to confirm select metals concentrations in ground water sampled from temporary well points.**

1.2 Report Organization

This Supplemental RI Report is organized into four sections:

- Section 1.0 - Introduction;

- Section 2.0 - Supplemental RI Activities;

- Section 3.0 - Site Characterization; and

- Section 4.0 - Summary and Conclusions.

The report text is supported by sections of tables, figures, and appendices. The tables and appendices provide detailed tabulations and/or discussions of the RI results. Relevant tabular summaries are also inserted throughout the report to summarize relevant data. The appendices include: Technical Memoranda which describe in detail the Supplemental RI activities, field methods, and findings; and Supplemental RI data including boring and monitoring well logs, hydraulic conductivity, and analytical data.

SECTION 2.0 SUPPLEMENTAL RI ACTIVITIES

2.1 Introduction

This section presents a discussion of the Supplemental RI **and Addendum to the Supplemental RI (Supplemental RI)** activities that were performed to address the remaining RI data gaps prior to completion of the FS. These activities included further characterization of selected areas of concern (AOC) and the ground-water system. This discussion includes a description of the techniques and methods used in the field investigations and analysis of environmental media. The Supplemental RI was performed in accordance with the Supplemental RI Work Plan (BB&L, December 1994), and with procedures set forth in the QAPP, SAP, and HASP (BB&L, August 1993). Detailed descriptions of the Supplemental RI procedures and findings are presented in the following appendices:

- Appendix A, Technical Memoranda;
- Appendix B, Boring and Well Logs;
- Appendix C, Hydraulic Conductivity Data;
- Appendix D, Analytical Data Tables;
- Appendix E, Laboratory QA/QC Summary; and
- Appendix F, Data Validation.

The Supplemental RI included: a site reconnaissance and off-site review; further delineation of identified impacted/source areas, including the chip chute areas and drainage ditches; identification of additional potential impacted/source areas, including the manufacturing building, the skimmer pond, and the east lot; and a hydrogeologic characterization. The hydrogeologic characterization included the installation of monitoring wells, temporary well points, ground-water sampling, and an evaluation of selected subsurface utilities. A site survey was performed to locate the Supplemental RI sampling points.

All Supplemental RI field activities performed at the site were observed by representatives from BB&L. Test borings, monitoring well installations, and temporary well points were performed by Parratt-Wolff, Inc., of East Syracuse, New York. Analytical laboratory services were performed by Galson Laboratories (Galson) of East Syracuse, New York. The Supplemental RI activities are discussed in the subsequent sections.

2.2 Site Reconnaissance and Off-Site Review

A site reconnaissance was performed on October 17, 1994, in conjunction with the preparation of the Supplemental RI Work Plan. The objectives of the site reconnaissance were as follows:

- Assess that the selected Supplemental RI sampling locations were logistically feasible;
- Review contract/as-built drawings of underground utilities to provide information regarding potential constituent migration pathways; and
- Identify the proposed location of soil borings inside the manufacturing building, based on a review of contract/as-built drawings of the facility, the locations of potential releases, and a visual inspection of the facility.

During the site reconnaissance, all the proposed Supplemental RI sampling locations were observed to be accessible and practical. A review of the contract/as-built drawings of underground utilities indicated two potential pathways for constituent migration. One potential pathway for constituent migration is via ground-water flow along the outside surface of utility pipes and/or through porous bedding material located around utility pipes. Two utility pipes, the water supply and the sanitary sewer, were identified to continue off site. A second potential pathway for constituent migration via the utilities is through ground-water infiltration into the utility pipes.

Based on a review of contract/as-built drawings of the manufacturing building, the hardening room pit and the two former degreaser storage pits were targeted for investigation during the Supplemental RI because trichloroethene (TCE) was known to have been handled in these areas.

The off-site review consisted of obtaining additional background information, such as historical aerial photographs showing adjacent properties, tax maps, and the state and federal databases. This information was reviewed to determine if adjacent properties have the potential to impact the Chicago Pneumatic site or the off-site drainage ditches adjacent to the site. An aerial photograph and a tax map from December 1978, obtained from the Herkimer County Clerks office, were used in conjunction with aerial photographs from 1960 and 1968 that had been obtained prior to the RI to review historic activities on adjacent properties. In addition, information from a database search of state and federal records on the Vista database was reviewed for any listing within 0.5 miles of the site. Based on this review, it does not appear that adjacent properties impact the site.

An abandoned railroad bed is present off site that transects the off-site drainage ditch. The off-site drainage ditch transects the former railroad bed. In general, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and metals are often associated with railroad beds. The presence of this former railroad bed may impact sediment quality in the off-site drainage ditch. The former railroad bed is currently covered with gravel and fill and is used as an access road (see Figure 4).

The western property line was located in the field by a licensed surveyor from BB&L, based on a description and a map of the Chicago Pneumatic property in a deed on file in the Herkimer County clerks office. This information was used to verify that the unnamed creek is located entirely on Chicago Pneumatic property. The creek flows into an approximately 36-inch-diameter concrete culvert before leaving the site to the north, under Bleecker Street.

2.3 Delineation of Impacted/Source Areas

This section describes the additional characterization of the former chip chute area and the drainage ditches/unnamed creek to address remaining data gaps. A discussion of the Supplemental RI activities conducted at these identified impacted/source areas is presented in the subsections below.

2.3.1 Former Chip Chute Area

Two test borings were advanced in the former chip chute area and one till sample was collected from the base of each boring for chemical characterization to delineate the vertical extent of constituents observed at the overburden/till interface. The following presents an overview of the soil boring sampling activities and the chemical characterization of the two till samples.

The two test borings, CHSB-4 and CHSB-5, were advanced on November 28 and 29, 1994 to depths of 18 and 14 feet below ground level (bgl), respectively. Glacial till was observed at approximately 5 feet bgl and consisted of purple-gray, dense silt and sand. Soil samples were collected continuously with standard split-spoon samplers and screened with a photoionization detector (PID) to measure total volatile organic compounds (VOCs) in the soil headspace. The borings were advanced until two consecutive soil samples had PID readings less than or equal to background readings. Samples for chemical characterization were collected from the 16- to 18-foot interval at boring CHSB-4, and from the 12- to 14-foot interval at boring CHSB-5. A detailed description of test boring installation activities is presented in Appendix A-1 - Test Boring Installations, Technical Memorandum. Test boring logs are provided in Appendix B. Test boring locations are presented on Figure 2.

The two till samples from the former chip chute area submitted for chemical characterization were analyzed for the following Target Compound List/Target Analyte List (TCL/TAL) constituents using NYSDEC 91-ASP methods:

VOCs	Inorganics
cis-Dichloroethene	Cadmium
trans-Dichloroethene	Chromium
Trichloroethene	Copper
Vinyl Chloride	Iron
2-Butanone	Lead
Toluene	Nickel
Xylene (total)	Zinc

A summary of the analytical results is presented in Appendix D. Further discussion of the chemical characterization of the former chip chute area is presented in Section 3.0.

2.3.2 Drainage Ditches/Unnamed Creek

Sediment/soil samples were obtained from predetermined locations in the on-site southern drainage ditch, the unnamed creek, and the off-site drainage ditch, to further delineate the vertical and horizontal extent of constituents detected during the RI. In addition, the soil pile located adjacent to the chip chute drainage ditch was sampled. This soil pile was removed from the chip chute drainage ditch by Chicago Pneumatic to facilitate flow in the drainage ditch. The sediment sampling activities are discussed below. A detailed description of the sediment/soil sampling activities is presented in Appendix A-5 - Sediment/Soil Sample Collection, Technical Memorandum. On-site sample locations are shown on Figure 2. Off-site sampling locations are shown on Figure 4.

<u>On Site</u>

Soil/sediment sampling was performed at three transect locations. Two transects, CSSD-1 and CSSD-2, were located in the unnamed creek, and one transect, CSSD-3, was located in the southern drainage ditch, north of the debris landfill and separation ponds.

At each transect, invert and/or bank soil/sediment samples were collected. Sediment samples were collected from inverts and from each side bank at transect numbers 2 and 3 and only from the side banks at transect number 1. The invert sample SD-1, collected during the RI in November 1994, will be used for the invert sample at transect number 1. Transect locations are shown on Figure 2.

Sediment samples were collected using a clear Lexan® tube coring tool that was advanced until refusal. Upon retrieval, the depth of soil/sediment penetrated and the length of the soil/sediment core were measured and a physical description of the soil/sediment was made. Side bank samples were collected at mid-height of each bank. Soil/sediment samples were collected from the 0- to 6-inch and 6- to 12-inch depth intervals.

Composite samples were collected from the soil/sediment piles on the north side of the chip chute drainage ditch and adjacent to the manufacturing building. Three randomly selected grab samples were collected from the 0- to 6-inch and 6- to 12-inch depth intervals and composited into one sample, CHCH-Comp, per depth interval for chemical characterization. Grab samples were collected with a stainless-steel hand trowel pushed into the soil/sediment.

The soil/sediment samples collected from the on-site drainage ditch, unnamed creek, and the chip chute drainage ditch soil pile were analyzed for the following TCL/TAL constituents using NYSDEC 91-ASP methods:

Inorganics	Other
Cadmium	PCBs
Chromium	
Copper	
Iron	
Lead	
Mercury	
Nickel	
Zinc	

A summary of the analytical results is presented in Appendix D. Further discussion of the chemical characterization of the soil/sediment sample obtained from the on-site drainage ditch and unnamed creek is presented in Section 3.0.

Off Site

A total of 22 sediment samples were collected from 14 locations in the off-site drainage ditch to further delineate the extent of PCBs and lead in sediment. The sediment samples (OSSD-4 through OSSD-17) were collected in the off-site drainage ditch at 50-foot intervals, beginning 50-feet downstream of the last location sampled during the RI in 1993 (OSSD-3). Sediment samples were collected at the drainage ditch inverts from the 0- to 6-inch and 6- to 12-inch depth intervals if sufficient sediment existed. At each sample location, the sediment was obtained utilizing Lexan® tube core sampling procedures. The sediment was obtained by pushing the Lexan® core tube into the sediment and driving the tube into the sediment utilizing a stainless-steel core driver until refusal. A vacuum was created within the Lexan® tube with a hand pump in order to keep the sediment in the tube during retrieval. The cores were then extruded and segmented. A stainless steel scoop was used at OSSD-17 to collect the sample due to gravel and rocks at this location. The off-site sediment sampling locations are shown on Figure 4.

Additional off-site soil sampling was conducted near the abandoned railroad track north of Bleecker Street to assess the potential for PCB and lead contributions from the former railroad tracks to impact the off-site drainage ditch sediment. One soil sample, RRBB, was collected midway on the south bank above the off-site drainage ditch as it enters a culvert; a second sample, RRBC, was collected from the top of the north bank of the railroad at the drainage ditch. At each location, the top 6 inches of soil was removed with a pick; soil at the 6- to 12-inch interval was collected for analysis utilizing a stainless steel scoop, and placed into the appropriate sample containers.

The soil/sediment samples collected from the off-site drainage ditch were analyzed for the following TCL/TAL constituents using NYSDEC 91-ASP methods:

Inorganics	Other
Lead	PCBs

A summary of the analytical results is presented in Appendix D. Further discussion of the chemical characterization of the soil/sediment samples obtained from the off-site drainage ditch is presented in Section 3.0.

2.4 Identification of Additional Potential Impacted/Source Areas

This section describes the Supplemental RI activities performed to identify additional potential impacted/source areas. Characterization of the manufacturing building, the skimmer pond, and the east lot was performed in the Supplemental RI. A discussion of the Supplemental RI activities conducted in these three potential impacted/source areas is presented in the subsections below.

2.4.1 Manufacturing Building

Four test borings, MBSB-1 through MBSB-4, were advanced through the floor of the manufacturing building adjacent to the former hardening room pit and two former degreaser storage pits. The purpose of these borings was to determine whether the source of VOCs observed in the ground-water samples north of the manufacturing building and in the clay discharge pipe originate from below the building foundation. A detailed description of test boring installation activities is presented in Appendix A-1 - Test Boring Installations, Technical Memorandum. Test boring logs are presented in Appendix B. Test boring locations are identified on Figure 2.

Test boring MBSB-1 was advanced downgradient of two former degreaser storage pits. The boring was advanced to a depth of 10 feet below the floor surface (bfs). Glacial till was observed to be 8.5 feet bfs. Moist, sand and silt were observed above the soil/till interface. Test boring MBSB-2 was advanced north and downgradient of the hardening room pit. The boring was advanced to a depth of 16 feet bfs where split-spoon refusal occurred. Glacial till was observed at 11 feet bfs, underlying a light brown fine to medium sand. The sand graded from moist to wet two feet above the soil/till interface. Test boring MBSB-3 was advanced northeast and downgradient of the hardening room pit. The boring was advanced to a depth of 13 feet bfs. Glacial till was observed at 12 feet bfs, underlying a light brown fine to medium sand. The sand graded from moist to wet two feet above the soil/till interface. Test Boring MBSB-4 was installed northwest and downgradient of the hardening room pit, adjacent to a sump located in the pit, which collected liquids that may have spilled in the pit prior to being pumped out. The boring was advanced to a depth of 12 feet bfs. Glacial till was observed at 11 feet bfs, underlying a light brown fine to medium sand. The sand graded from moist to wet two feet above the soil/till interface.

Ground-water samples were not collected at borings MBSB-1, MBSB-3, and MBSB-4, as proposed in the Supplemental RI Work Plan, because water did not accumulate within these borings. Samples of saturated soil were collected from MBSB-3 and MBSB-4 above the soil/till interface as an alternative to a water sample. Saturated soil was not observed in boring MBSB-1. A sample was also collected from boring MBSB-2 and was consistent with the soil samples obtained from borings MBSB-3 and MBSB-4.

Eight soil samples and one ground-water sample from below the floor of the manufacturing building were sent to Galson Laboratories for analytical characterization. One sample of unsaturated soil was collected from the 8 to 9-foot interval at each boring and submitted for analysis. One sample of silty water was collected from the 10- to 12-foot interval at boring MBSB-2 and submitted for analysis. One sample of saturated soil was collected from the 10- to 11-foot interval at borings MBSB-2, MBSB-3, and MBSB-4. One till sample was collected from the 14- to 16-foot interval at boring MBSB-2 to assess the potential for vertical migration of constituents into the till.

The eight soil samples and one ground-water sample obtained from below the manufacturing building and were analyzed for the following TCL compounds using NYSDEC 91-ASP methods:

VOCs

cis-Dichloroethene

trans-Dichloroethene

Trichloroethene

Vinyl Chloride

2-Butanone

A summary of the analytical results is presented in Appendix D. Further discussion of the chemical characterization of the soil and till below the manufacturing building is presented in Section 3.0.

2.4.2 Skimmer Pond

A total of four sediment/soil cores (SKSD-1 through SKSD-4) were advanced into the sidebanks of the skimmer pond to characterize the sediment/soil quality. One core was advanced at the water line, to refusal, on each of the four sides of the skimmer pond using a clear Lexan® tube coring tool. Upon retrieval, the depth of sediment/soil penetrated and the length of the core were measured and described. Sediment/soil samples were obtained from the 0- to 6-inch and the 6- to 12-inch intervals and retained for compositing. A detailed description of the sediment/soil sampling activities is presented in Appendix A-5 - Sediment/Soil Sample Collection, Technical Memorandum. The sediment sample locations are shown on Figure 2.

Prior to compositing, partial samples from each interval at SKSD-2 (north side) and SKSD-3 (east side) were collected for VOC analysis to minimize disturbance of the samples and reduce loss of VOCs to the atmosphere. Each 6-inch interval from each of the four cores were composited with the corresponding depth interval from the other cores and submitted for chemical characterization of non-VOC constituents. An additional sediment/soil sample (SKSD-5) was collected from the center of the skimmer pond to characterize sediment/soil quality at the base of the pond. A clear Lexan® tube coring tool was used to collect the samples from the proposed 0- to 6-inch and the 6- to 12-inch interval.

Sediment/soil samples were analyzed for the following TCL/TAL constituents using NYSDEC 91-ASP methods:

VOCs (SKSD-2 & SKSD-3 only)	Inorganics	Other
cis-Dichloroethene	Cadmium	PCBs
trans-Dichloroethene	Chromium	
Trichloroethene	Copper	
2-Butanone	Iron	
Vinyl Chloride	Lead	
Toluene	Mercury	
Xylene (total)	Nickel	
	Zinc	

A summary of the analytical results is presented in Appendix D. Further discussion of the chemical characterization of the sediment/soil samples obtained from the skimmer pond is presented in Section 3.0.

2.4.3 East Lot

The East Lot investigation was conducted in two separate phases. The first phase was conducted in conjunction with the Supplemental RI activities and the second phase as an Addendum to the Supplemental RI. The activities completed during each phase are discussed below.

Supplemental RI

Three test borings were advanced in the east lot area, adjacent to ground-water monitoring well MW-5 to determine whether the constituents observed in ground-water samples from well MW-5 could be attributed to contributions from the surrounding soil. One soil sample was collected from the one-foot interval above the water table and one ground-water sample was collected from each boring. The following presents an overview of the soil boring sampling activities and the chemical characterization performed on the soil and ground-water samples obtained from the east lot. A detailed description of the test boring installation activities is presented in Appendix A-1 - Test Boring Installations, Technical Memorandum. Test boring logs are presented in Appendix B. Test boring locations are identified on Figure 2.

The three test borings, ELSB-1, ELSB-2, and ELSB-3 were installed on November 28, 1994. Each test boring was advanced to approximately three feet below the water table, to a total depth of approximately 6 feet bgl. Soil samples were collected continuously with a split-spoon sampler and screened for total VOCs with a PID. Ground-water samples were collected from each boring by lowering a 1-inch-diameter, 0.010-inch slot Schedule 40 PVC screen to the base of the boring and withdrawing a water sample with a bottom-loading bailer.

The three soil and three ground-water samples submitted for chemical characterization from the east lot area were analyzed for the following TCL/TAL constituents using NYSDEC 91-ASP methods:

VOCs	Inorganics	Other
cis-Dichloroethene	Cadmium	PCBs
trans-Dichloroethene	Chromium	
Trichloroethene	Copper	
Vinyl Chloride	Iron	
2-Butanone	Lead	
Toluene	Nickel	
Xylene (total)	Zinc	

Addendum to the Supplemental RI

A total of eleven test pits (TPEL-1 through TPEL-11) were advanced in the East Lot adjacent to, and southwest of, monitoring well MW-5. The purpose of the test pits was to determine whether soil is the source of VOCs and PCBs present in the ground-water samples collected at monitoring well MW-5. The locations of the test pits are presented on Figure 2A.

Each test pit was excavated to the top of till with a backhoe equipped with an 18-inch bucket. The depth to till ranged from 3 to 4 feet. Ground water was not observed in any of the test pits. The test pits advanced southwest of well MW-5 (TPEL-1 through TPEL-7, TPEL-9, and TPEL-10) did not show visual evidence of waste material or stained soil. PID readings were not above background within the test pits. Two soil samples were obtained from test pits TPEL-1 and TPEL-5 for chemical characterization to confirm that the soil is not impacted.

The two test pits (TPEL-8 and TPEL-11) advanced to the east side of well MW-5, contained black-stained soil. PID readings from within these test pits ranged between 30 and 50 parts per million (ppm). The horizontal extent of the stained soil was delineated by extending the test pits until unstained, visually clean soil was observed. Test pit TPEL-8 was used to delineate the east-to-west extent of the stained soil, and TPEL-11 was used to delineate the north-to-south extent of the stained soil. The vertical extent of staining was limited by the till, which was encountered approximately 3 feet below grade.

In addition to visual observation of clean soil, soil samples were collected from visually clean soil in the test pits for chemical characterization to confirm the extent of impacted soil. Two soil samples (TPEL-11-2 and TPEL-11-3) were collected to delineate the extent of impacted soil to the north and south, respectively. Three soil samples (ELSB-1, ELSB-2, and ELSB-3), which were collected in November 1994 from test borings, were used to delineate the extent of impacted soil to the west and east. Two soil samples were also collected from TPEL-8 and TPEL-11 to characterize the impacted soil.

The six soil samples collected from the test pits were submitted to the analytical laboratory for chemical characterization and analyzed for the following select Target Compound List (TCL) constituents using NYSDEC 91-Analytical Services Protocol (ASP) methods, in accordance with the RI/FS QAPP:

<u>VOCs</u>	<u>Other</u>
cis-Dichloroethene	PCBs
trans-Dichloroethene	
Trichloroethene	
Vinyl Chloride	
2-Butanone	
Toluene	
Xylene (total)	

The two stained soil samples (TPEL-8 and TPEL-11) were also analyzed for Toxicity Characteristic Leaching Procedure (TCLP) VOCs.

A summary of the analytical results is presented in Appendix D. Further discussion of the chemical characterization of the east lot area is presented in Section 3.0.

2.5 Hydrogeologic Characterization

This section describes the Supplemental RI activities completed for the hydrogeologic characterization of the site. This characterization included additional deep monitoring well installations, installation and sampling of temporary well points, sampling of select ground-water monitoring wells and residential supply wells, and an investigation of subsurface utilities. **The Addendum to the Supplemental RI included the installation of one new monitoring well, MW-16S, in the northwest corner of the site.**

Monitoring Well Installation

Two new bedrock ground-water monitoring wells were installed during November 1994, as part of the Supplemental RI activities. The wells were installed in the weathered shale bedrock to further assess ground-water quality in the uppermost bedrock. Monitoring well MW-2D was installed to a depth of 29.5 feet below grade, hydraulically downgradient of well MW-9D and the former separation ponds. A second well, MW-15D, was installed to a depth of 34.5 feet below grade, approximately 15 feet east of monitoring well MW-15, north and hydraulically downgradient of the manufacturing building. Both wells were installed in the weathered shale bedrock below the till. The monitoring well locations are shown on Figure 2.

One shallow monitoring well was installed on October 9, 1995, as part of the Addendum to the Supplemental RI. This well was installed to straddle the water table to further assess the concentrations of select metals detected in the temporary well points. Monitoring well MW-16S was installed to a total depth of 10 feet, the top of the overburden/till interface.

Soil borings were advanced using 4¼-inch inside diameter hollow stem augers. Soil samples were obtained continuously from the ground surface to the total depth of the boring using 2-inch-diameter, 2-foot long standard split-spoon samplers driven by a 140-lb. hammer falling 30 inches. After the boring was advanced to the desired depth, a 2-inch-diameter flush threaded Schedule 40 PVC riser and 0.010-inch slot well screen were assembled to the specifications of the on-site geologist and lowered to the bottom of the boring. As the augers were raised from the boring, a #0 Morie filter sand was placed between the PVC well screen and the boring. A hydrated bentonite slurry was tremied into place above the sand pack to create a flexible seal, and the remaining annular space was filled with a cement/bentonite grout to within one foot of the surface.

The wells were completed at the surface with a 1.5-foot-diameter concrete pad and either a bolted flush mount cover or a 4-inch-diameter steel protective casing. A detailed description of monitoring well installation is presented in Appendix A-3 - Monitoring Well/Hydraulic Conductivity Testing, Technical Memorandum. Individual well completion details and boring logs are included in Appendix B.

Following completion, the ground-water monitoring wells were developed to remove any fine material that may have migrated into the sand pack during installation. This was accomplished by repeatedly surging and removing water from the well with a 2-foot long, 1.6-inch-diameter stainless steel bailer. This procedure was continued until the water entering the well was relatively free of sediment. All purge water was contained on site in a 1,000-gallon polyethylene tank. During well development, 70 gallons of water was removed from monitoring well MW-2D. The water was light gray with low to moderate turbidity. A total of 80 gallons of water was removed from monitoring well MW-15D. The water was light gray with low turbidity. **A total of 100 gallons were removed from monitoring well MW-16S. The water was light brown with low turbidity.**

Rising head tests were performed on the two new **bedrock** monitoring wells on December 1, 1994 to estimate the hydraulic conductivity of the screened formations. These tests were performed by removing a slug of water from the well to lower the water level in the well. Water levels were recorded on a data logger capable of recording two water level measurements per second. A detailed description of the hydraulic conductivity testing is presented in Appendix A-3 - Monitoring Well Installation/Hydraulic Conductivity Testing, Technical Memorandum.

Temporary Well Points

A total of 18 temporary well points (HPGW-01 through HPGW-18) were installed north of the manufacturing building on November 29 and 30, 1994. The temporary well points were advanced to the top of till to delineate the horizontal extent of VOC constituents in the ground-water north and northwest of the manufacturing building. A detailed description of the temporary well point installation and sampling is presented in Appendix A-2 - Temporary Well Point Installation and Sampling, Technical Memorandum. Temporary well point locations are shown on Figure 2.

The temporary well points were installed by Parratt-Wolff, Inc., using the hydropunch method. At each location, a 2-inch casing with a disposable drive point was advanced 8- to 10-feet below grade to the top of the glacial till, with a 140-lb. hammer. When advancement of the casing was complete, a 1-inch-diameter, 0.010-inch slot PVC well screen was lowered to the bottom of the casing. The casing was then pulled out with the drill rig, leaving the drive point and well screen in place. The well points were sampled approximately two hours after installation was completed.

After ground-water sampling was completed, the well screens were removed and the remaining **borehole** was grouted to the surface. Each location was marked with a survey flag and labeled so the well point location and elevation could be determined and recorded on the site map.

Ground-water samples were collected from the well points using a ¾-inch diameter teflon bailer suspended from monofilament. In an effort to reduce the turbidity of the sample, several well volumes of water were removed from the well points, where possible, prior to sampling. Ground-water samples collected from the well points were submitted to the laboratory for analytical characterization of the following TCL compounds using NYSDEC 91-ASP protocols:

VOCs

cis-Dichloroethene

trans-Dichloroethene

Trichloroethene

Vinyl Chloride

2-Butanone

A summary of the analytical results is presented in Appendix D. Further discussion of the chemical characterization of the ground-water samples obtained from the temporary well point samples is presented in Section 3.0.

Ground-Water Sampling

Ground-water sampling was conducted in two separate phases. The first phase was conducted in conjunction with the Supplemental RI activities and the second phase as an Addendum to the Supplemental RI. The activities completed during each phase are discussed below.

Supplemental RI

Ground-water samples were collected from 10 ground-water monitoring wells on December 7, 1994. Two residential wells were sampled on December 13, 1994. Ground-water samples were collected from the two new deep monitoring wells, MW-2D and MW-15D, and one existing deep well, MW-9D. Three shallow monitoring wells, MW-6, MW-7, and MW-15, were sampled to evaluate the trend in ground-water concentrations north of the manufacturing building. Four monitoring wells, MW-5, MW-13, MW-13D, and MW-14, were sampled as part of the east lot investigation. Two residential wells, located at 166B Argyle Road (Pileggi) and 166AA Arcadia Road (Roberts), were sampled to evaluate the potential for constituent migration from the site to residential water supply wells to the east. A detailed description of the ground-water sampling procedures is presented in Appendix A-4 - Ground-Water Sample Collection, Technical Memorandum.

Prior to sampling each monitoring well, the total volume of water within the well was calculated and three to five well volumes were removed from the well. If the well went dry prior to purging three well volumes, the well was allowed to recover prior to sampling. A new disposable teflon bailer was used to collect a sample of the top of the water column to observe clarity and possible sheens or films. Ground-water samples were poured directly from the dedicated bailer to the appropriate laboratory-supplied sample containers.

Ground-water samples from the Pileggi residence were collected from the kitchen faucet, with the aerator removed, because a water treatment system or softener was not in use. Because a water softener was in use at the Roberts Residence, the samples were collected from a spigot in the water line prior to the softener.

Ground-water samples collected from the monitoring wells and the residential wells were analyzed for the following TCL/TAL constituents using NYSDEC 91-ASP protocols:

VOCs	Inorganics	Other
cis-Dichloroethene	Cadmium	PCBs
trans-Dichloroethene	Chromium	
Trichloroethene	Copper	
Vinyl Chloride	Iron	
Toluene	Lead	
Xylene (total)	Zinc	
2-Butanone		

One filtered sample was obtained to assess dissolved concentrations, and one unfiltered sample was obtained to assess total concentrations of PCBs from each of the east lot monitoring wells.

Two complete rounds of water-level measurements were obtained from all on-site monitoring wells during the Supplemental RI field activities. The first round of water-level measurements was performed prior to ground-water sample collection. The second round of water-level measurements was performed on January 16, 1995, and included a measurement of the separation pond elevation. Ground-water elevations from the two events were used to prepare ground-water contour maps for the overburden and weathered bedrock formations. Ground-water contour maps are shown on Figures 6 through 9. Ground-water measurements and elevation data are summarized in Table 1.

Addendum to the Supplemental RI

Ground-water samples were collected from monitoring wells MW-7S and MW-16S in October 1995 as part of the Addendum to the Supplemental RI to further evaluate concentrations of select metals in ground water samples obtained from the temporary well points. In addition, one soil sample was collected from monitoring well boring MW-16S at the 2- to 4-foot depth interval to evaluate the potential for soil to contribute concentrations of select metals to ground water.

The ground-water and soil samples were analyzed for the following select TAL metals using NYSDEC 91-ASP methods, in accordance with the RI/FS QAPP:

Cadmium	Iron
Chromium	Lead
Copper	Zinc

A summary of the analytical results is presented in Appendix D. Further discussion of the chemical characterization of the ground-water samples is presented in Section 3.0.

Subsurface Utilities

Potential utility pathways for constituent migration were evaluated during the Supplemental RI. One potential pathway for constituent migration is via ground-water flow along the outside surface of utility pipes and/or through porous bedding material located around utility pipes. To evaluate this potential migration pathway, the 8-inch-diameter sanitary sewer pipe and the two 8-inch-diameter water lines were investigated.

The evaluation of the outside of the water line and sanitary sewer pipe utilities as potential pathways for constituent migration was performed by collecting four ground-water samples (HPGW-19 through HPGW-22) from trench backfill adjacent to each of the two utilities. The ground-water samples were obtained from temporary well points. The ground-water samples were obtained from approximately the same depth intervals as the utilities. The temporary well point sample locations are shown on Figure 2.

A second potential pathway for constituent migration via the utilities is through ground-water infiltration into the utility pipes. To evaluate this potential migration pathway, the two stormwater pipes that lead to State Pollutant Discharge Elimination System (SPDES) Outfalls 001 and 002 were investigated. The investigation consisted of collecting water samples from four manholes and Outfall 002 during non-precipitation flow conditions. Water from Outfall 001 was not sampled because the discharge was submerged in the unnamed creek. The following physical data were collected from each manhole:

- Flow rate (using a flow meter);
- pH;
- Conductivity; and
- Turbidity.

A detailed description of the subsurface utility investigation is presented in Appendix A-6 - Subsurface Utilities Investigation, Technical Memorandum.

Ground-water samples, the outfall water sample, and the manhole water samples were analyzed for the following TCL/TAL constituents using NYSDEC 91-ASP methods:

VOCs	Inorganics	Other
cis-Dichloroethene	Cadmium	PCBs
trans-Dichloroethene	Chromium	
Trichloroethene	Copper	
Vinyl Chloride	Iron	
	Lead	
	Nickel	
	Zinc	

A summary of the analytical results is presented in Appendix D. Further discussion of the chemical characterization of the subsurface utilities investigation is presented in Section 3.0.

To evaluate the potential for sediment trapped in the base of the storm sewer lines to act as a sources of the constituents observed in outfalls 001 and 002, one sediment sample was collected from the bottom of each of the four manholes shown on Figure 10. These sediment samples were analyzed for the same chemical constituents as the sediment/soil samples collected from the on-site drainage ditches and unnamed creek.

The sediment/soil samples collected from the manholes were analyzed for the following TAL constituents using NYSDEC 91-ASP methods:

Inorganics	Other
Cadmium	PCBs
Chromium	
Copper	
Iron	
Lead	

Mercury
Nickel
Zinc

A summary of the analytical results is presented in Appendix D. Further discussion of the chemical characterization of the sediment/soil sample obtained from the manholes is presented in Section 3.0.

2.6 Site Survey

At the conclusion of the field investigations, a survey was performed and a site map generated to horizontally and vertically locate the new monitoring wells, the sediment sampling locations, the soil boring locations, and any other sampling locations relating to the Supplemental RI. This survey provided vertical control to with 0.01 feet for each monitoring well. In addition to the sampling location survey, the western site property boundary was located and staked. The survey methods conformed to standards and performance criteria for a third order, Class 2 survey, as specified in Standards and Specifications for Geodetic Control Networks, Federal Geodetic Control Committee, September 1898, as well as standard professional surveying practices and procedures. The vertical control of elevations was based on the National Geodetic Vertical Datum (NGVD) of 1988. The horizontal control of locations was based on an assumed coordinate system.

SECTION 3.0 SITE CHARACTERIZATION

3.1 General

This section presents a discussion of the physical and chemical characterization of the soil, sediments, and ground-water samples obtained during the Supplemental RI **and the Addendum to the Supplemental RI (Supplemental RI)**. The discussion of the site characterizations associated with the Supplemental RI is presented in the following sections:

- Delineation of Impacted/Source Areas;
- Identification of Additional Potential Impacted/Source Areas; and
- Hydrogeologic Characterization.

The concentration of organic and inorganic constituents detected in the soil, sediment, and ground-water were compared to NYSDEC-recommended soil cleanup objectives included in the NYSDEC Division of Technical and Administrative Guidance Memorandum (TAGM) HWR-92-4046, "Determination of Soil Cleanup Objectives and Cleanup Levels," January 1994 and soil concentrations detected in representative background samples. The TAGM recommended cleanup values are not considered, at this stage, to be final cleanup levels for soil, but will be considered when evaluating remedial technologies if a corrective action is required. These comparisons were performed to provide guidance in identifying impacted areas and constituents of interest at each impacted area. Constituents of interest are considered those organic and inorganic constituents present at elevated concentrations, in comparison to the TAGM-recommended values and/or in the case of metal constituents, the arithmetic mean of the background concentration range plus two standard deviations. The background concentrations for samples collected during the RI are presented in the RI Report (BB&L, October 1994).

3.2 Delineation of Impacted/Source Areas

This section presents a discussion of the data obtained to delineate the horizontal and/or vertical extent of constituents observed during the RI at impacted/source areas. An impacted area is defined as an area containing soil or sediment with concentrations of organic and/or inorganic constituents above either TAGM-recommended values, or above the mean background concentrations. To constitute a potential source area, the impacted media must have chemical constituents present at elevated concentrations that appear to be connected to a migration pathway, specifically, the ground-water and surface water pathways.

Based on the concentrations of chemical constituents detected during the RI sampling, the following AOCs were identified as impacted/potential source areas:

- Debris Landfill Area;
- Separation Pond Area;
- Chip Chute Area; and
- Drainage Ditches/Unnamed Creek.

Additional characterization of the debris landfill and separation pond areas was not performed during the Supplemental RI. A discussion of the characterization of these AOCs can be found in the RI Report (BB&L, October 1994). The Supplemental RI characterization performed at the chip chute area and drainage ditches/unnamed creek is discussed in the following subsections.

3.2.1 Former Chip Chute Area

Chemical characterization of till samples obtained from two test borings, CHSB-4 and CHSB-5, advanced 12 and 7 feet respectively, into the glacial till underlying the former chip chute area, was used to assess the vertical extent of impacted soil/till in this area. In these samples, the concentrations of VOCs are less than the TAGM-recommended values, and the concentrations of metals are at or less than the TAGM-recommended and mean background values. Based on these data, the vertical extent of impacted soil in the chip chute area does not extend more than 7 to 12 feet into the till. The horizontal extent of impacted soil was assessed during the RI and is presented in the RI Report (BB&L, October 1994). Figure 2 shows the location of the test borings. A summary of the analytical data is presented in Appendix D.

The following table summarizes the concentration of chromium detected in background soil samples and the chromium concentration detected greater than the arithmetic mean of the background concentration plus two standard deviations in the till sample obtained from one of the test borings advanced in the former chip chute area.

Constituent	NYSDEC TAGM Recommended Cleanup Objective	CHSB-4 (16-18')
Chromium	10/SB (19.3)	20.3

Note:

All concentrations are reported in mg/kg (ppm).
SB = Site background.
The number in parentheses represents the arithmetic mean plus two standard deviations of the range of background concentrations detected in soil.

Soil sample CHSB-4 (16 to 18 feet) was obtained from the western portion of the former chip chute area approximately 12 feet below the top of the soil/till interface. Soil sample CHSB-5 (12 to 14 feet) was obtained from the eastern portion of the former chip chute area approximately 7 feet below the top of the soil/till interface.

VOCs were not detected above the TAGM-recommended values in the till samples collected from below the chip chute area. Chromium was the only metal constituent detected above background concentrations; however, the detected concentration is only 1.0 parts per million (ppm) above the mean background concentration.

3.2.2 Drainage Ditches and Unnamed Creek

Chemical characterization of the sediment/soil samples collected from the transects located in the southern drainage ditch, the unnamed creek, and the grab samples obtained from the soil pile adjacent to the chip chute drainage ditch indicates that PCBs and metals are present at concentrations that exceed the TAGM-recommended values at some locations. These sediment/soil samples were collected to further delineate the horizontal and vertical extent of impacted sediment/soil in the drainage ditches. The locations of the sediment/soil samples are shown on Figure 2. A summary of the analytical data is presented in Appendix D.

The following table summarizes the concentration of PCBs detected above the TAGM-recommended value and metal constituents detected at concentrations greater than the TAGM-recommended value or the arithmetic mean of the background concentrations plus two standard deviations in the sediment/soil samples obtained from the drainage ditches and unnamed creek.

CHIP CHUTE DRAINAGE DITCH SOIL PILE

Constituent	NYSDEC TAGM Recommended Cleanup Objective	CHCH-Comp (0-6")	CHCH-Comp (6-12")
PCBs			
Aroclor 1248	NA	--	--
Aroclor 1254	NA	12	13P
Aroclor 1260	NA	3.2J	4.8
Total PCBs	1.0	15.2J	17.8J
Inorganics			
Cadmium	1.0/SB (--)	3.1	2.1
Chromium	10/SB (19.3)	59.4	35.2
Copper	25/SB (43.2)	364	216
Lead	SB (27.3)	152	121
Mercury	0.1	0.26	0.15
Nickel	13/SB (30.8)	67.6	42.3
Zinc	20/SB (109)	367	222

UNNAMED CREEK

Constituent	NYSDEC TAGM Recommended Cleanup Objective	CSSD1-L (0-6")	CSSD1-L (6-12")	CSSD1-R (0-6")	CSSD1-R (6-12")	CSSD2-I (0-6")	CSSD2-I (6-12")	CSSD2-L (0-6")	CSSD2-L (6-12")	CSSD2-R (0-6")	CSSD2-R (6-12")
PCBs											
Aroclor 1248	NA	--	--	--	--	--	--	--	--	0.200P	0.430
Aroclor 1254	NA	--	--	--	--	--	--	--	--	0.940	1.100
Aroclor 1260	NA	--	--	--	--	--	--	--	--	0.320	0.094P
Total PCBs	1.0	--	--	--	--	--	--	--	--	1.46	1.62
Inorganics											
Cadmium	1.0/SB(-)	1.9	1.2B	1.3	1.6	--	--	--	2.2	1.2	1.8
Chromium	10/SB (19.3)	60.6B	239B	23.1B	--	42.2B	30.2B	30.2B	43.7B	128B	37.0B
Copper	25/SB (43.2)	304	447	56.3	49.3	149	122	265	460	1,770	23,900
Lead	SB (27.3)	327	115	33.2	--	184	112	55.7	168	136	120
Mercury	0.1	0.13B	--	0.12B	--	--	0.13B	--	0.13B	--	--
Nickel	13/SB (30.8)	44.1	--	--	40.2	--	--	--	55.5	155	177
Zinc	20/SB (109)	304	217	--	92.3	171	164	174	424	549	1,080

SOUTHERN DRAINAGE DITCH

Constituent	NYSDEC TAGM Recommended Cleanup Objective	CSSD3-I (0-6")	CSSD3-I (6-12")	CSSD3-L (0-6")	CSSD3-R (6-12")
PCBs					
Aroclor 1248	NA	--	--	--	--
Aroclor 1254	NA	360P	37P	--	23P
Aroclor 1260	NA	110	14	--	4.9P
Total PCBs	1.0	470	51	--	27.9P
Inorganics					
Cadmium	1.0/SB (-)	10.4	1.6	1.7	6.0
Chromium	10/SB (19.3)	199	--	--	261
Copper	25/SB (43.2)	1,220	--	64.3	1,130
Lead	SB (27.3)	556	--	34.4	227
Mercury	0.1	2.1	0.28	--	2.7
Nickel	13/SB (30.8)	135	--	--	171
Zinc	20/SB (109)	683	--	127	454

Notes:

All concentrations are reported in mg/kg (ppm).
B = Estimated value, inorganic constituent concentration is less than the sample quantitation limit but greater than the instrument detection level.
J = Estimated value, organic constituent concentration is less than the sample quantitation limit but greater than the instrument detection level.
P = Greater than a 25% difference between the two G.C. columns, the lower value is reported.
-- = Concentration not detected above the NYSDEC TAGM-recommended value.
NA = Not available.
SB = Site background.
The number in the parentheses represents the arithmetic mean plus two standard deviations of the range of background concentrations detected in soil.

Total PCB concentrations exceed the TAGM-recommended value in sediment/soil samples collected from two transects, CSSD-2 and CSSD-3, and the composite sample, CHCH-Comp, collected from the chip chute drainage ditch soil pile. Sediment/soil samples collected from transect CSSD-1, located in the unnamed creek, did not contain PCB concentrations above the TAGM-recommended value. Metal concentrations exceed the mean background concentration in the soil pile composite and in a majority of the transect samples.

Soil samples CHCH-Comp (0-6") and CHCH-Comp (6-12") were composited from three locations in the soil piles adjacent to the chip chute drainage ditch. Total PCB concentrations ranged from 15.2 ppm in the 0- to 6-inch interval, to 16.8 ppm in the 6- to 12-inch interval. A total of seven inorganic constituents, cadmium, chromium, copper, lead, mercury, nickel, and zinc were detected at concentrations less than one order of magnitude above the TAGM-recommended value or mean background concentrations. Copper and lead were detected at the highest concentrations above the mean background concentrations.

Sediment/soil samples from locations CSSD-1 and CSSD-2 were collected from the transects located in the unnamed creek. PCBs were not detected in any of the samples collected from transect CSSD-1. Total PCBs were only detected in the right bank samples at both depth intervals collected from transect CSSD-2 at concentrations of 0.46 ppm and 0.62 ppm above the TAGM-recommended value. Cadmium, chromium, lead, nickel, and zinc were detected in a majority of the samples at concentrations up to one order of magnitude above the mean background concentration. Copper concentrations ranged from one to less than three orders of magnitude above the mean background concentration. Mercury was only detected at estimated concentrations less than 0.03 ppm above the TAGM-recommended values in less than half the samples.

Sediment/soil samples from location CSSD-3 were collected from the transect located in the southern drainage ditch. PCBs were detected in the samples collected from the invert sample location and the right bank sample. PCBs were not detected in the sample from the left bank, and only four metals were detected at concentrations slightly above the mean background concentrations. Total PCB concentrations ranged from one to less than three orders of magnitude above the TAGM-recommended values; the highest concentration detected was in the invert sample. Cadmium, chromium, copper, mercury, lead, nickel, and zinc concentrations ranged from non-detect to less than two orders of magnitude above the TAGM-recommended values or mean background concentrations.

A discussion of the ecological assessment including criteria-specific analysis for sediments is presented in Section 5.3.8 of the final RI Report (October 1994). The criteria-specific analysis evaluated the significance of potential exposure to maximum observed chemical concentrations. The comparison of detected chemical concentrations in sediment to site-specific sediment quality (SQC) used the maximum observed concentrations of individual chemicals. The data generated in the Supplemental RI is below or comparable to the maximum concentrations used in the evaluation. Therefore, this evaluation was not performed separately for the Supplemental RI sediment data.

<u>Off-Site Drainage Ditch</u>

Chemical characterization of the sediment/soil samples collected from the off-site drainage ditch north of Bleecker Street indicates that PCBs and lead are present at concentrations that exceed the TAGM-recommended values at some locations and in the samples obtained from the railroad bed. The location of the samples and the constituent concentrations are shown on Figure 4. A summary of the analytical data is presented in Appendix D.

The following table summarizes the concentration of PCBs detected above the TAGM-recommended values and lead concentrations detected above 25 ppm. A lead concentration of 25 ppm was defined as a screening level in the Supplemental RI Work Plan (BB&L, December 1994) for the off-site drainage ditch.

Constituent	NYSDEC TAGM Recommended Cleanup Objective	OSSD-5A	OSSD-6A	OSSD-6B	OSSD-7A	OSSD-7B	OSSD-8A
PCBs							
Aroclor 1254	NA	2.2	7.2	6.4	5.6	1.2	3.2
Aroclor 1260	NA	0.77	2.7	2.9	3.7	--	0.62
Total PCBs	1.0	2.98	9.4	9.3	9.3	1.2	3.82
Inorganics							
Lead	25	--	46.5	--	49.4	27.8	96.2

Constituent	NYSDEC TAGM Recommended Cleanup Objective	OSSD-9A	OSSD-9B	OSSD-10A	OSSD-10B	OSSD-11A	OSSD-11B	RRBB	RRBC
PCBs									
Aroclor 1254	NA	5.0	5.4	4.1	1.9	2.4	4.7	44	--
Aroclor 1260	NA	1.7	1.7	0.76	0.32	0.7	1.2	9.8	--
Total PCBs	1.0	6.7	7.1	4.86	2.22	3.1	5.9	53.8	--
Inorganics									
Lead	25	68.0	87.9	134	153	41.8	67.3	544	134

Notes:

All concentrations are reported in mg/kg (ppm).
P = Greater than a 25% difference between the two GC columns, the lower value is reported.
-- = Concentration not detected above the NYSDEC TAGM recommended value.
NA = Not available.

Total PCB concentrations are above the TAGM-recommended value in most of the off-site sediment/soil samples collected from sample locations OSSD-5 through OSSD-11. Total PCB concentrations were below 10 ppm at all the drainage ditch sample locations. Samples OSSD-5 through OSSD-11 are located in the east-west trending portion of the off-site drainage ditch. PCB concentrations are below the TAGM-recommended values of 1 ppm in samples OSSD-12 through OSSD-17 located in the north-south trending portion of the off-site drainage ditch. Lead was detected at concentrations above the screening value of 25 ppm in several of the samples obtained from sample locations OSSD-5 through OSSD-11; However, the presence of lead above 25 ppm is sporadic. Lead concentrations were below 25 ppm in all of the samples obtained from sample locations OSSD-12 through OSSD-17.

Surface soil samples, RRBB and RRBC, were collected from the banks of the abandoned railroad bed to evaluate the potential for the former railroad bed to contribute PCBs and lead to the sediment in the off-site drainage ditch. A total PCB concentration of 53.8 ppm was detected in sample RRBB. The total PCB concentration detected in sample RRBC did not exceed the TAGM-recommended value. Lead concentrations detected in samples RRBB and RRBC were 544 ppm and 134 ppm, respectively. These data suggests that the former railroad bed could be a source of PCBs and lead to the off-site drainage ditch sediment.

3.3 Identification of Additional Potential Impacted/Source Areas

This section presents a discussion of the chemical characterization performed at additional potential AOCs investigated during the Supplemental RI. The following potential AOCs were investigated during the Supplemental RI sampling:

- Manufacturing building;
- Skimmer pond; and
- East lot.

3.3.1 Manufacturing Building

Chemical characterization of the soil samples obtained from test borings MBSB-1, MBSB-2, MBSB-3, and MBSB-4, indicates that two VOCs, TCE and 2-butanone, are present at concentrations that slightly exceed the TAGM-recommended values in only one sample, MBSB-1. Figure 2 shows the locations of the test borings. A summary of the analytical data is presented in Appendix D.

The following table summarizes the concentrations of constituents detected in background samples and constituents detected above the TAGM-recommended values in the soil samples obtained from below the manufacturing building.

Constituent	NYSDEC TAGM Recommended Cleanup Objective	Background Range	MBSB-1 (8-9')
2-Butanone	0.3	ND	1.0JB
Trichloroethene	0.7	0.002J-0.003J	1.0

Note:

All concentrations are reported in mg/kg (ppm).
J = Estimated value, concentration is less than the sample quantitation limit but greater than the instrument detection limit.
B = Compound was detected in the blank as well as the sample.
ND = Not detected.

Two VOCs, TCE and 2-butanone, were detected above the TAGM-recommended values in soil sample MBSB-1 (8 to 9 feet), which was collected from the soil/till interface downgradient of two former degreaser storage pits. Both compounds were detected at 1.0 ppm, which is less than an order of magnitude above the TAGM-recommended values. 2-Butanone was detected at an estimated concentration below the instrument detection limit as well as in the laboratory QA/QC blank, which suggests its actual presence is not associated with the manufacturing building. TCE was detected at only 0.06 ppm above the TAGM-recommended value. Constituents were not detected above the TAGM-recommended values in the remainder of the soil and till samples collected from below the floor of the manufacturing building.

3.3.2 Skimmer Pond

Chemical characterization of the sediment/soil samples obtained from the skimmer pond indicates that PCBs and metals are present at concentrations that exceed TAGM-recommended values or the mean background concentrations. Only one VOC was present at a concentration less than 0.1 ppm above the TAGM-recommended value in two samples. Figure 2 shows the locations of the samples. A summary of the analytical data is presented in Appendix D.

The following table summarizes the concentrations of constituents identified in background samples, constituents detected above the TAGM-recommended value, and metals detected at concentrations greater than the TAGM-recommended value or the arithmetic mean of the background concentrations plus two standard deviations in the sediment/soil samples obtained from the skimmer pond.

Constituent	NYSDEC TAGM Recommended Cleanup Objective	SKSD-2 (0-6")	SKSD-5 (0-6")	SKSD-5 (6-12")	SKSD-Comp. (0-6")
VOCs					
cis-Dichloroethene	0.3	0.35D	0.36D	--	NA
PCBs					
Aroclor 1254	NA	NA	11P	15P	2.3P
Aroclor 1260	NA	NA	5.3	5.2P	0.29P
Total PCBs	1.0	NA	16.3	20.2P	2.6P
Inorganics					
Cadmium	1.0/SB (-)	NA	4.3	7.5	--
Chromium	10/SB (19.3)	NA	99	147	--
Copper	25/SB (43.2)	NA	771	846	73.6
Lead	SB (27.3)	NA	302	674	36.8
Mercury	0.1	NA	0.32	0.32	--
Nickel	13/SB (30.8)	NA	83.5	104	--
Zinc	20/SB (109)	NA	1,330	1,470	131

Note:

All concentrations are reported in mg/kg (ppm).
NA = Not available.
D = Compound was analyzed at a secondary dilution.
P = Greater than a 25% difference between the two GC columns, the lower value is reported.
ND = Not detected.
-- = Concentration not detected above the NYSDEC TAGM recommended value.
SB = Site background.
The number in parentheses represents the arithmetic mean plus two standard deviations of the range of background concentrations detected in soil.

One VOC, cis-DCE, was detected at a concentration slightly above the TAGM-recommended value in sediment/soil samples collected from the side and the bottom of the skimmer pond. Sample SKSD-2 (0 to 6"), collected from the north side of the skimmer pond, and sample SKSD-5 (0 to 6"), collected from the base of the skimmer pond, contained 0.35 and 0.36 ppm cis-dichloroethene respectively. These concentrations are less than 0.1 ppm above the TAGM-recommended value of 0.3 ppm.

Total PCB concentrations exceed the TAGM-recommended value in samples collected from the base of the skimmer pond and in a composite of samples collected from the four sides of the skimmer pond. Samples SKSD-5 (0 to 6") and SKSD-5 (6 to 12") contained total PCB concentrations of 16.3 and 20.2 ppm, respectively. These concentrations exceed the TAGM-recommended value by an order of magnitude. The composite sample SKSD-Comp (0 to 6") had a total PCB concentration of 2.6 ppm.

Metal concentrations exceed the TAGM-recommended values in samples collected from the base of the skimmer pond and in the composite of samples collected from the four sides of the skimmer pond. Samples SKSD-5 (0 to 6") and SKSD-5 (6 to 12") contained concentrations of cadmium, chromium, copper, lead, and zinc that exceed the mean background concentrations by up to an order of magnitude. Concentrations of mercury and nickel were slightly above the TAGM-recommended values. The composite sample SKSD-Comp contained concentrations of copper, lead, and zinc, that were above the mean background concentrations.

3.3.3 East Lot

Soil samples were obtained from the east lot during soil boring installation in conjunction with the Supplemental RI and from test pits excavated during the Addendum to the Supplemental RI. The soil samples were obtained from both black stained soil to characterize impacted soil and from visually clean soil outside the limits of the stained soil to delineate extent.

The soil samples obtained from the visually stained soil in test pits TPEL-8 and TPEL-11 contained concentrations of toluene, xylene, and PCBs present at concentrations above the NYSDEC TAGM recommended values. The results of the TCLP for VOCs on these two samples did not show any VOCs in the leachate, with the exception of chlorobenzene, which was present at five orders of magnitude below the regulatory level. The following table summarizes the concentrations of constituents detected above the NYSDEC TAGM recommended values:

Constituent	NYSDEC TAGM Recommended Cleanup Objective	TPEL-8	TPEL-11
Toluene	1.5	--	2.6
Xylene	1.2	--	2.5
Total PCBs	10	54.5 P	240.0 P

Notes:

All concentrations are reported in mg/kg (ppm).
P = Greater than a 25% difference between the two GC columns, the lower value is reported.
-- = Concentration not detected above the NYSDEC TAGM recommended value.

The soil samples obtained from non-stained soil in test pit TPEL-11 and in the three test borings, ELSB-1, ELSB-2, and ELSB-3, did not contain concentrations of VOCs or PCBs above the analytical method detection limit or, if present, not above the TAGM-recommended values. The two samples obtained from test pit TP-11 delineated the extent to the north and south and the test boring samples delineated the extent to the east and west. The total area of impacted soil measures approximately 80 feet by 20 feet. The locations of the test pit and soil boring samples are shown on Figure 2A.

3.4 Hydrogeologic Characterization

This section presents a discussion of the chemical and physical characterization of the hydrogeologic system investigated during the Supplemental RI. The physical characterization included estimating the hydraulic conductivity at the two new deep ground-water monitoring wells and collecting two rounds of ground-water elevation measurements from all the monitoring wells. The chemical characterization included ground-water sampling and analysis at two off-site residential water supply wells, 10 selected ground-water monitoring wells **in November 1994, and two monitoring wells in the northwest corner of the site in October 1995**, 22 temporary well points, and an evaluation of water and sediment in the subsurface utilities (stormwater and sanitary sewer lines).

Physical Characterization

Ground-water elevations were obtained from all the monitoring wells on two occasions, and the skimmer pond on one occasion, during the Supplemental RI to further evaluate water-level fluctuations and to assess changes in flow direction. Ground-water elevations were comparable to those obtained during the RI sampling event in January 1994. The skimmer pond elevation is approximately 3 feet lower than the ground-water elevation observed in the nearest monitoring well, MW-5, and is therefore receiving discharge from ground water. The overburden and bedrock horizontal ground-water flow directions are generally to the north-northeast, toward the Mohawk River. Table 1 summarizes the ground-water elevations. Ground-water elevation contour maps for the overburden and the weathered shale bedrock are presented on Figures 6 through 9.

The average horizontal gradient in the overburden is approximately 0.014. The horizontal gradient in the weathered shale bedrock is also approximately 0.014, as observed between monitoring wells MW-10D and MW-6D. These values are consistent with the RI ground-water data obtained in January 1994.

The average hydraulic conductivities of the two new deep ground-water monitoring wells installed in the weathered shale bedrock were calculated using the Bouwer-Rice method. The hydraulic conductivities calculated from the in-situ tests are 8.2×10^{-4} cm/sec at monitoring well MW-2D, and 3.2×10^{-3} cm/sec at monitoring well MW-15D. These values are within the range of hydraulic conductivities calculated at the other deep monitoring wells installed in the weathered shale bedrock during the RI.

Geologic cross-sections A-A' and B-B', originally presented in the RI Report (BB&L, October 1994), were revised to include stratigraphic information obtained during the installation of monitoring wells, MW-2D and MW-15D, and test borings MBSB-1 and MBSB-2. The revised cross sections are shown on Figure 3. The stratigraphy did not change significantly as a result of these additions.

Chemical Characterization

The chemical constituents detected in the ground-water samples were compared to NYSDEC standards and/or guidance values set forth in the NYSDEC Division of Technical and Operational Guidance Series (TOGS 1.1.1), Ambient Water Quality Standards and Guidance Values, October 1993. These standards are used only for comparative purposes. Concentrations detected in ground-water samples were also compared to concentrations detected in the hydraulically upgradient (background) monitoring wells to asses potential contributions from off-site sources or naturally occurring background concentrations that are not related to impacted/potential source areas at the site. The wells that are located hydraulically upgradient of the identified impacted/source areas are MW-10, MW-10D, and MW-14.

3.4.1 Residential Water-Supply Well Sampling

Ground-water samples were collected from two residential water supply wells to determine if site related constituents had impacted the water supply to the east and hydraulically sidegradient of the site. Constituents were not detected in either of the two residential supply well samples above NYSDEC standards and/or the laboratory method detection limits. A summary of the analytical data is presented in Appendix D.

3.4.2 Ground-Water Sampling

Ground-water samples were obtained from 10 select monitoring wells **across the site**, including the two newly installed deep wells, and 18 temporary well points **in December 1994**. Some of the ground-water samples contained VOCs, PCBs, and inorganic constituents at concentrations that exceed the NYSDEC standards. **Ground-water samples were obtained from two monitoring wells in the northeast corner of the site in October 1995.** The monitoring well locations, temporary well point locations, and chemical distribution in ground water are shown on Figure 5. A summary of the analytical data is presented in Appendix D.

The following tables summarize the concentrations of constituents detected above the NYSDEC standards in ground-water samples collected during the Supplemental RI.

Constituent	NYSDEC Standards	MW-2D	MW-5	MW-6	MW-7	MW-9D	MW-13S	MW-14	MW-15	MW-15D
VOCs										
Vinyl Chloride	2	--	12	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	5	--	--	--	--	99	--	--	--	--
Trichloroethene	5	--	--	--	--	6	--	--	69	--
Total PCBs										
Aroclor 1254	NA	NA	420J	NA	NA	NA	--	--	NA	NA
Aroclor 1260	NA	NA	47J	NA	NA	NA	--	--	NA	NA
Total PCBs	0.1	NA	467J	NA	NA	NA	--	--	NA	NA
Dissolved PCBs										
Aroclor 1254	NA	NA	120J	NA	NA	NA	--	--	NA	NA
Aroclor 1260	NA	NA	16J	NA	NA	NA	--	--	NA	NA
Total PCBs	0.1	NA	136J	NA	NA	NA	--	--	NA	NA
Inorganics										
Chromium	50	--	--	--	72	--	--	--	--	--
Copper	200	--	--	--	226	--	--	--	--	--
Iron	300	9,120	52,600	26,400	137,000	24,500	3,340	17,100	8,290	20,400
Lead	25	--	--	--	97	--	--	--	--	--
Zinc	300	--	--	--	370	--	--	--	--	--

Constituent	NYSDEC Standards Objective	East Lot			Manufacturing Building	North of Manufacturing Building			
		ELSB-1W	ELSB-2W	ELSB-3W	MBSB-2W	HPGW-1	HPGW-2	HPGW-3	HPGW-4
VOCs									
cis-1,2-Dichloroethene	5	--	--	--	7J	--	--	15	--
Trichloroethene	5	--	--	--	22J	16,000	26	44	32
Inorganics									
Cadmium	10	--	11J	--	NA	NA	NA	NA	NA
Chromium	50	59J	81J	--	NA	NA	NA	NA	NA
Copper	200	250	1,130J	--	NA	NA	NA	NA	NA
Iron	300	9,280	58,500J	14,200	NA	NA	NA	NA	NA
Lead	25	--	44.2J	38.7	NA	NA	NA	NA	NA
Zinc	300	--	1,720J	--	NA	NA	NA	NA	NA

Notes:

All concentrations reported in ug/L (ppb).
J = The reported value is less than the required quantitation limit, but greater than the instrument detection limit, or as required by data validation.
P = Greater than 25% difference between the two GC columns, the lower value is reported.
-- = Concentration not detected above the NYSDEC standard.
NA = Not available.

A total of three VOCs, vinyl chloride, DCE, and TCE, were detected in three ground water monitoring wells and five temporary well points at concentrations that exceed the NYSDEC standards. Ground-water samples collected from the three monitoring wells, MW-5, MW-9D, and MW-15, contained VOC concentrations similar to concentrations detected during the previous sampling events in January and April 1994.

The ground-water sample from monitoring well MW-5 contained detected concentrations of vinyl chloride and was the only well in the east lot to have any VOCs detected above NYSDEC standards. VOCs were not detected in the three ground-water samples obtained from temporary well points ELSB-1W through ELSB-3W, located adjacent to well MW-5 in the east lot.

Monitoring well MW-9D located downgradient of the separation ponds, contained detected concentrations of DCE and TCE at similar concentrations as detected in the previous sampling events. No other ground-water samples obtained from the deep monitoring wells contained concentrations of VOCs above NYSDEC standards.

Monitoring well MW-15, located north and hydraulically downgradient of the manufacturing building, continued to have concentrations of TCE above the NYSDEC standard.

Total PCB concentrations exceed the NYSDEC standard in one ground-water monitoring well, MW-5. Ground-water samples collected from monitoring well MW-5 had a total PCB concentration of 467 parts per billion (ppb). The total dissolved PCB concentration in the ground water sample collected from well MW-5 was 136 ppb. PCBs were not detected in the other monitoring wells sampled during the Supplemental RI.

A total of five metals were detected at concentrations exceeding the NYSDEC standards at the monitoring wells. Iron was detected in each of the ground-water monitoring wells from one to two orders of magnitude above the NYSDEC standard. However, the concentration of iron detected in the upgradient (background) monitoring wells were also above the NYSDEC standard for iron. This suggests a naturally high iron concentration in the ground-water system. Chromium, copper, lead, and zinc were only detected above the NYSDEC standard in the ground-water sample obtained from monitoring well MW-7.

A total of six metals were detected in the ground-water samples collected from the three temporary well points advanced adjacent to MW-5 in the east lot. Iron was detected in each of the samples at one to two orders of magnitude above the NYSDEC standard. Chromium was detected in samples ELSB-1W and ELSB-2W at estimated concentrations slightly above the NYSDEC standard. Copper was detected in samples ELSB-1W and ELSB-2W at concentrations less than one order of magnitude above the NYSDEC standard. Lead was detected in samples ELSB-2W and ELSB-3W at an estimated concentration slightly above the NYSDEC standard. Zinc was detected in sample ELSB-2W at an estimated concentration less than one order of magnitude above the NYSDEC standard. Cadmium was detected in sample ELSB-2W at an estimated concentration slightly above the NYSDEC standard.

The ground-water samples collected from temporary well points HPGW-1, HPGW-2, HPGW-3, and HPGW-4, located on the northeast side of the manufacturing building, contained VOC concentrations similar to those observed during the Geoprobe investigation conducted as part of the RI in November 1994. VOCs were not detected in ground-water samples collected from HPGW-5 through HPGW-18, located northwest of the manufacturing building.

The ground-water samples collected from temporary well point MBSB-2, the boring inside the manufacturing building, indicate that two VOCs, DCE, and TCE, were detected in the ground-water sample obtained from below the manufacturing building at concentrations that slightly exceed the NYSDEC standards. The VOC concentrations in the ground-water samples obtained from below the manufacturing building are orders of magnitude lower than concentrations observed in ground-water samples obtained north of the manufacturing building.

The presence of metals in the temporary well point samples at concentrations slightly above the NYSDEC standards may be attributable to the high turbidity of the samples. Laboratory analysis of these turbid ground-water samples include a measurement of metal ions present in silt and clay particles that are suspended in the water sample. **To confirm this likelihood, ground-water samples were obtained from a properly developed monitoring well, MW-16S, located adjacent to the temporary well points and with concentrations of metals above the NYSDEC standards and from well MW-7.**

The only metal detected above the NYSDEC standard in the ground-water samples from monitoring wells MW-7S and MW-16S was iron, detected in sample MW-16S at 529 ppb. This ground-water concentration is within the general range detected at the other on-site monitoring wells and less than the site background concentration for iron in ground-water, which is between 2,400 and 77,100 ppb (RI Report, October 1995). Iron was detected in the soil sample obtained from monitoring well MW-16S at a concentration of 5,190 ppm. This soil concentration is less than the site background concentration of iron in soil, which is 54,156 ppm (RI Report, October 1994).

3.4.3 Evaluation of Subsurface Utilities

Four ground-water samples were obtained from, within, or adjacent to the backfill associated with the water line and the sanitary sewer line to assess the potential for constituent migration via ground-water flow through the porous bedding material. Water and sediment samples were collected from four manholes that connect to the storm water sewer pipes adjacent to the manufacturing building, and a water sample was collected from SPDES outfall 002. The location of the manholes and the SPDES outfall are shown on Figure 10. A summary of the analytical data is presented in Appendix D.

Water

Chemical characterization of water samples collected from four temporary well points, and four manholes indicates that two VOCs were detected in the water samples collected from three manholes at concentrations that exceed NYSDEC standards. A total of six metals were detected in the ground-water samples obtained from four temporary well points at concentrations that exceed NYSDEC standards. Chemical characterization of a water sample collected from SPDES outfall 002 indicates that one metal, iron, is present in the discharge water at a concentration that exceeds the NYSDEC standard. A summary of the analytical data is presented in Appendix D.

The following table summarizes the concentrations of constituents detected above the NYSDEC standards in the water samples obtained from the subsurface utilities.

Constituent	NYSDEC Standard	MHSW-1	MHSW-2	MHSW-4	SPDES-002	HPGW-19	HPGW-20	HPGW-21	HPGW-22
VOCs									
cis-1,2-Dichloroethene	5	13	6	6	--	--	--	--	--
Trichloroethene	5	12	--	--	--	--	--	--	--
Inorganics									
Cadmium	10	--	--	--	--	--	19J	--	--
Chromium	50	--	--	--	--	--	281J	--	--
Copper	200	--	--	--	--	--	1,570J	--	--
Iron	300	--	--	--	3,880	10,200	858,000J	34,000J	29,000
Lead	25	--	--	--	--	--	412J	39.5J	33.2
Zinc	300	--	--	--	--	--	2,250J	--	--

Notes:

All concentrations are reported in ug/L (ppb).
P = Greater than a 25% difference between the two GC columns, the lower value is reported.
-- = Concentration not detected above the NYSDEC standard.
J = The reported value is less than the required quantitation limit, but greater than the instrument detection limit, or as required by data validation.

A total of six metals were detected in the ground-water samples collected from the four temporary well points, HPGW-19 through HPGW-22, advanced within or adjacent to the backfill associated with utility lines, in the northwest parking lot. Iron was detected in each of the samples at two to four orders of magnitude above the NYSDEC standard. Chromium, copper, and zinc were detected in sample HPGW-20 at estimated concentrations less than one order of magnitude above the NYSDEC standards. Lead was detected in samples HPGW-20, HPGW-21, and HPGW-22 at concentrations up to one order of magnitude above the NYSDEC standard. In addition, cadmium was detected slightly above the NYSDEC standard at an estimated concentration in ground-water samples HPGW-20

TCE and DCE were detected in the water sample collected from manhole MHSW-1 at concentrations that exceed the NYSDEC standards. DCE was detected in the water samples collected from manholes MHSW-2 and MHSW-4 at concentrations that exceed the NYSDEC standard by only 1 ppb. VOCs were not detected above NYSDEC standards in the water sample from manhole MHSW-3.

Metals were not detected above NYSDEC standards in the water samples collected from the manholes; however, iron was detected in the water sample collected from SPDES outfall 002 at a concentration of 3,880 ppb.

Sediment

Chemical characterization of the sediment samples collected from each of the four manholes indicates that PCBs and metal constituents are present in the sediment within the manholes at concentrations that exceed the TAGM-recommended values. A summary of the analytical data is presented in Appendix D.

The following table summarizes the concentration of PCBs detected above the TAGM-recommended values and metal constituents detected at concentrations greater than the TAGM-recommended value or the arithmetic mean of the background concentrations plus two standard deviations in the sediment samples obtained from within the manholes.

Constituent	NYSDEC TAGM Recommended Cleanup Objective	MHSD-1	MHSD-2	MHSD-3	MHSD-4
PCBs					
Aroclor 1254	NA	--	1.9P	840P	--
Aroclor 1260	NA	--	0.3	--	--
Total PCBs	1.0	--	2.2	840	--
Inorganics					
Cadmium	1.0/SB (--)	3.8	1.4	23.9	1.1
Chromium	10/SB (19.3)	343	71.5	900	73.6
Copper	25/SB (43.2)	1,270	270	10,900	659
Iron	2,000/SB (54,000)	--	--	181,000	--
Lead	SB (27.3)	843	131	780	145
Mercury	0.1	1.1	--	0.7	--
Nickel	13/SB (30.8)	219	45.8	1,670	53.6
Zinc	20/SB (109)	394	1,060	3,080	761

Notes:

All concentrations are reported in mg/kg (ppm).
P = Greater than a 25% difference between the two GC columns, the lower value is reported.
-- = Concentration not detected above the NYSDEC standard.
NA = Not available.
SB = Site background.
The number in parentheses represents the arithmetic mean plus two standard deviations of the range of background concentrations detected in soil.

Total PCB concentrations exceed the TAGM-recommended value in sediment samples collected from the two stormwater sewer manholes, MHSD-2 and MHSD-3, on the north side of the manufacturing building. Sediment samples collected from the manholes located south of the manufacturing building did not contain PCB concentrations above the TAGM-recommended values.

Metal concentrations exceed the TAGM-recommended values in all four of the manholes sampled. Cadmium, chromium, copper, lead, nickel, and zinc were detected in the sediment samples from each manhole at concentrations that exceed the TAGM-recommended values or the mean background concentrations. Mercury was detected in sediment samples MHSD-1 and MHSD-3 at concentrations that only slightly exceed the TAGM-recommended values. In addition, iron was detected in sediment sample MHSD-3 at a concentration approximately three times the mean background concentration.

SECTION 4.0 SUMMARY AND CONCLUSIONS

4.1 Introduction

This section summarizes the results of the Supplemental RI **and the Addendum to the Supplemental RI.** The objective of the Supplemental RI was to address remaining data gaps in the RI in order to meet the overall objectives of the RI and to complete the FS. The overall RI objectives were met, including the identification, characterization, and delineation of source/impacted areas and an evaluation of the nature and extent of chemical constituents in the soil/fill, sediment, surface water, and ground water. The FS is completed based on the RI, Supplemental RI, **and the Addendum to the Supplemental RI** data.

The previous sections of this report presented a overall discussion of the Supplemental RI activities and the physical and chemical characterization of the site. This section presents a summary of how each data gap identified in the Supplemental RI Work Plan was addressed during the execution of the Supplemental RI. This format of addressing the specific data gaps, as developed in the conceptual site model and the completion of the RI, provides the summary and conclusions of the Supplemental RI.

4.2 Impacted/Source Area Summary

The summary and conclusions of the Supplemental RI activities performed at each identified and potential impacted/source area are presented by addressing the data gaps presented in the Supplemental RI Work Plan (BB&L, December 1994).

- **Determine the vertical extent of impacted till beneath the former chip chute area.**

  The extent of vertical migration of constituents beneath the former chip chute area was addressed by advancing two borings in the chip chute area to collect samples of till for chemical characterization.

  Chemical characterization of till samples obtained from two test borings, CHSB-4 and CHSB-5, advanced 7 to 12 feet, respectively, into the glacial till underlying the former chip chute area, indicates that concentrations of VOCs are less than the TAGM-recommended values. Metal concentrations are at or less than the mean background values. The vertical extent of impacted till in this area was assessed using the chemical characterization of these soil samples. Based on these data, the vertical extent of impacted till does not extend more than 7 to 12 feet into the top of the till. The horizontal extent of impacted soil was assessed during the RI and is presented in the RI Report (BB&L, October 1994)

- **Further assess the extent of impacted sediment/soil in the unnamed creek west of the site and the drainage ditches (on site and off site).**

This objective was addressed by conducting additional sediment/soil sampling at selected locations within the unnamed creek and the on-site and off-site drainage ditches. Three transects were sampled to further delineate the horizontal and vertical extent of constituents of interest, specifically, PCBs and metals. One transect was located in the southern drainage ditch and two transects were located in the unnamed creek. A composite sample was obtained from the chip chute drainage ditch soil pile to determine if PCBs and metals are present. This soil pile was removed from the chip chute drainage ditch by Chicago Pneumatic to facilitate flow within the ditch. In addition, a total of 14 sediment samples were obtained at 50-foot intervals in the off-site drainage ditch to determine the horizontal extent of PCBs and lead.

Chemical characterization of the sediment/soil samples collected from the southern drainage ditch transect indicates that PCBs are present at concentrations above the TAGM-recommended value of 1.0 ppm in the invert samples and in a sample obtained from the right bank. Several metals were detected at concentrations above the mean background concentrations in the southern drainage ditch. The highest concentrations of metals were in the invert sample obtained from a depth of 0 to 6 inches. Concentrations were generally lower in the samples obtained from the 6- to 12-inch interval.

Chemical characterization of the sediment/soil samples collected from the unnamed creek indicates that PCBs are not widespread in the unnamed creek at concentrations that exceed the TAGM-recommended value. PCBs were not detected above the TAGM-recommended value in eight of the 10 samples. PCBs were detected at less than 1 ppm above the TAGM-recommended value in two samples obtained from the right bank of transect 2. Metal concentrations were greater than the mean background concentrations in a majority of the sediment samples. In general, metals concentrations were highest in the samples obtained from the right bank of transect 2.

Chemical characterization of composite samples obtained from the chip chute drainage ditch soil pile indicates that PCBs and metals are present at concentrations greater than the TAGM-recommended value and the mean background concentrations.

Chemical characterization of sediment/soil samples obtained from the off-site drainage ditch indicates that total PCB concentrations are above 1.0 ppm, but below 10 ppm in the samples obtained in the east-west trending portion of the drainage ditch. In addition, lead concentrations exceed the screening value of 25 ppm in a majority of the samples obtained from the east-west trending portion of the drainage ditch. PCB and lead concentrations were below the screening values in the samples obtained from the north-south trending portion of the drainage ditch. The extent of PCBs and lead in the off-site drainage ditch has been defined based on the samples collected. In addition, two samples were obtained from the former railroad bed under which the off-site drainage ditch flows. PCBs and lead were detected in these samples, suggesting that the railroad bed are a contributing source to sediments in the off-site drainage ditch.

- **Assess potential impacted soil and ground water beneath the manufacturing building.**

This objective was addressed by advancing four test borings inside the manufacturing building, adjacent to the former hardening room and downgradient of two former degreaser storage pits, and obtaining soil and ground-water samples for chemical characterization to determine the presence of VOCs beneath the manufacturing building.

Chemical characterization of soil samples obtained from the four test borings indicates that only one soil sample had detected concentrations of two VOCs present at concentrations slightly greater than the TAGM-recommended values. Soil sample MBSB-1, located downgradient of two former degreaser storage pits, had detected concentrations of TCE and 2-butanone slightly above the TAGM-recommended values. TCE was present at a concentration that exceeded the TAGM-recommended value by only 0.3 ppm, and 2-butanone was present at a concentration that exceeded the TAGM-recommended value by only 0.7 ppm. However, 2-butanone was reported as an estimated concentration below the method quantitation limits as well as in the laboratory blank. The actual presence of 2-butanone in the soil sample not associated with contribution from the manufacturing building. No other constituents were detected at concentrations above the TAGM-recommended values in the soil samples obtained from beneath the manufacturing building.

Based on these data, the soil beneath the manufacturing building is not the source of TCE and DCE observed in ground-water samples obtained north and hydraulically downgradient of the manufacturing building.

One ground-water sample was obtained and analyzed for VOCs from test boring MBSB-2W. TCE and DCE were both detected in the ground-water sample at estimated concentrations slightly above the TAGM-recommended values; however, concentrations were significantly lower than observed in the ground-water samples obtained north and hydraulically downgradient of the manufacturing building.

The geoprobe/hydropunch samples obtained north and downgradient of the manufacturing building and storm sewer pipe trenches indicate that the horizontal extent of TCE and DCE is narrow, and does not parallel the storm sewer pipe trenches, which run east to west and parallel to the manufacturing building. TCE and DCE do not radiate out from the manufacturing building in a typical plume shape, as would be expected if the storm sewer pipe trenches were a source. In addition, it is unlikely that the concentrations of TCE and DCE observed in the former clay pipe were from residual concentrations present in pipe trench backfill. All other potential upgradient sources at the site were investigated and identified. The presence of VOCs in the ground water north of the manufacturing building is addressed in the FS and additional investigation in this area would not significantly alter the remedial alternatives under consideration.

- **Characterize soil quality within the skimmer pond.**

This objective was addressed by obtaining sediment/soil samples from within the skimmer pond.

Chemical characterization of sediment/soil samples obtained from within the skimmer pond indicates PCBs and metals are present at concentrations greater than the TAGM-recommended value for total PCBs and the mean background concentrations for metals. Sediment/soil samples collected from the sides and from the bottom of the skimmer pond had concentrations of PCBs and metals present at concentrations above the TAGM-recommended value and/or mean background levels for metals. These data indicate that the skimmer pond sediment/soil has been impacted. The skimmer pond is considered an impacted/source area at the Chicago Pneumatic site.

- **Further assess the top of bedrock ground-water quality.**

This objective was addressed by installing and sampling of one deep ground-water monitoring well, MW-2D, located hydraulically downgradient of monitoring well MW-9D and the separation pond area, and one deep ground-water well, MW-15D, located downgradient of the manufacturing building, near well MW-15. The deep monitoring wells are installed in the weathered shale bedrock below the till. In addition, deep monitoring well MW-9D was resampled.

Chemical characterization of ground-water samples from the deep monitoring wells indicates that two VOCs, DCE and TCE, are present in ground-water samples obtained at monitoring well MW-9D at concentrations similar to those observed during previous sampling events conducted in 1994. Monitoring well MW-9D is located hydraulically downgradient of the former separation ponds. Monitoring well MW-2D was installed as part of the Supplemental RI to assess potential migration of the VOCs detected in monitoring well MW-9D. No VOCs were detected in the ground-water samples obtained at monitoring well MW-2D. No other deep monitoring wells have had detections of VOCs above the NYSDEC standards. Based on these data, the extent of VOCs in the deep ground-water system appears to be limited to the vicinity of monitoring well MW-9D and the separation ponds.

Iron was the only constituent detected above NYSDEC standards in the deep monitoring wells; however, iron was above the NYSDEC standard in samples obtained from the deep background monitoring well MW-10D. This suggests that iron concentrations are naturally high in the deep ground-water system.

- **Assess ground-water quality in two residential water supply wells located east of the site.**

This objective was addressed by collecting a ground-water sample from two residential water supply wells and performing chemical characterization for site-related constituents.

The ground-water sampling results indicate that the TCL/TAL constituents analyzed for are not present at concentrations above the NYSDEC standards. Based on these data, no off-site migration of site-related constituents were detected in these wells. Furthermore, ground-water contour maps indicate these houses are sidegradient, not hydraulically downgradient, of the site and impacted/source areas.

- **Perform additional ground-water sampling at selected monitoring wells.**

This objective was addressed by **installing one additional monitoring well, MW-16S, in the northwest corner of the site and** collecting one additional round of ground-water samples from selected monitoring wells for chemical characterization of selected constituents to further assess chemical trends observed in the RI data, particularly with respect to PCBs detected in ground-water samples obtained from the east lot monitoring wells **and select metals detected in ground-water samples obtained from the temporary well points in the northwest corner of the site.**

Chemical characterization of ground-water samples collected from monitoring wells located in the east lot indicates that one VOC, vinyl chloride, and PCBs are present in the ground-water samples at concentrations that exceed the NYSDEC standards at monitoring well MW-5. VOCs and PCBs were not detected in the other monitoring wells sampled in the east lot or in ground-water samples obtained from three temporary well points located in the vicinity of monitoring well MW-5. Based on these data, the extent of vinyl chloride and PCBs in ground-water in the east lot is limited to the vicinity of monitoring well MW-5.

Concentrations of iron were above the NYSDEC standard in all monitoring wells sampled, including upgradient (background) monitoring wells. This suggests that iron concentrations are naturally high in the ground-water system. Concentrations of chromium, copper, lead, and zinc were present above the NYSDEC standards in monitoring well MW-7 **and the December 1994 sampling. However, concentrations of these metals were below NYSDEC standards at the October 1995 sampling.** Metal concentrations were not detected above the NYSDEC standards at other monitoring wells sampled.

- **Perform supplemental hydrogeologic investigations to delineate constituents in the shallow ground-water system north of the manufacturing building.**

This objective was addressed by implementing a ground-water sampling program that consisted of the installation and sampling of 18 temporary well points in the area between the manufacturing building and the Bleecker Street drainage ditch and resampling monitoring well MW-15.

Chemical characterization of four ground-water samples obtained from temporary well points HPGW-1 through HPGW-4, located on the northeast side of the manufacturing building, indicates concentrations of TCE and, to a lesser extent, DCE are present at concentrations above the NYSDEC standards. The concentrations were similar to those observed during the Geoprobe investigation conducted in November 1994.

Chemical characterization of ground-water samples obtained from monitoring well MW-15 indicates that TCE is present at a concentration above the NYSDEC standard.

Chemical characterization of ground-water samples obtained from temporary well points HPGW-5 through HPGW-18, located on the northwest side of the manufacturing building, indicates that VOCs, specifically TCE and DCE, are not present. Based on these data, the extent of TCE and DCE is limited to the shallow ground-water system on the northeast side of the manufacturing building.

- **Evaluate site utilities as pathways for constituent migration.**

This objective was addressed by obtaining ground-water samples from four temporary well points located in the backfill adjacent to the sanitary sewer and water lines to evaluate whether these utility lines are acting as pathways for constituent migration. In addition, the stormwater sewer was evaluated by collecting water and sediment samples from four manholes connected to the storm sewer adjacent to the manufacturing building.

Chemical characterization of four ground-water samples obtained from temporary well points HPGW-19 through HPGW-22, located within or adjacent to the backfill associated with the water line and sanitary sewer pipe lines, indicates that VOCs are not present in any of the samples and concentrations of metals are present above the NYSDEC standards in some samples. Based on these data, VOCs detected in the ground-water system northeast of the manufacturing building and beneath the manufacturing building are not migrating off site via the backfill material associated with the utility lines. The concentrations of metals detected in the two samples may be attributed to contributions from the utility pipes. The ground-water sample obtained from temporary well point HPGW-20, located adjacent to the water line, had concentrations of cadmium, chromium, copper, lead, and zinc present above the NYSDEC standards. The ground-water sample obtained from temporary well points HPGW-21 and HPGW-22, located adjacent to the sewer line, had elevated concentrations of lead. **The concentrations of metals in the ground-water samples obtained from the temporary well points may be attributed to relatively high turbidity in the samples in comparison to samples obtained from a fully developed monitoring well. This is supported by the ground-water data obtained from monitoring wells MW-16S and MW-7S. Ground-water sampled in October 1995 did not have concentrations of metals above the NYSDEC standards, with the exception of iron, which is present below the concentrations observed in the background ground-water samples.**

Chemical characterization of water samples obtained from four manholes indicates that TCE and DCE are present in the sample obtained from MHSW-1 and DCE is present in the samples obtained from manholes MHSW-2 and MHSW-4. These manholes discharge to outfalls 001 and 002; however, only lead was detected above the NYSDEC standard in the water sample obtained from outfall 002. Historically, TCE and DCE have not been in exceedance of the SPDES discharge requirements for outfalls 001 and 002.

Chemical characterization of sediment samples obtained from the four manholes indicates that PCBs are present in the two manhole samples, MHSD-2 and MHSD-3, located north of the manufacturing building. However, the sample from manhole MHSD-3 is two orders of magnitude greater than detected in the sample from manhole MHSD-2, located downstream of MHSD-3. This suggests that potential sediment migration from manhole to manhole is limited. The concentrations of several metals were detected above the NYSDEC standards in the sediment samples obtained from all four manholes.

Based on these data, the sediment and water in the manholes and associated utility lines may be a source of constituents to outfalls 001 and 002 and the unnamed creek sediment.

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5.2 Abbreviations

Abbreviation	Definition
AA	Atomic Adsorption
AOC	Area of Concern
ASTM	American Society for Testing and Materials
bgl	Below Ground Level
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, and Xylene
CCV	Continuing Calibration Verification
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cfs	Cubic Feet Per Second
CLP	Contract Laboratory Protocol
cm/sec	Centimeters Per Second
COC	Chain of Custody
COD	Chemical Oxygen Demand
CPRP	Contributing Potentially Responsible Party
CRA	Contract Required Detection Limit Standard for Atomic Adsorption Analysis
CRDL	Contract Required Detection Limit
CRI	Contract Required Detection Limit Standard for Inductively Coupled Plasma Emission
CRQL	Contract Required Quantitation Limit
DCE	1,2-Dichloroethane
DI	Distilled
DQO	Data Quality Objective
FS	Feasibility Study
FSP	Field Sampling Plan
ft/day	Feet Per Day
GC/MS	Gas Chromatography/Mass Spectrometry
GFAA	Graphite Furnace Atomic Adsorption
GWSF	Ground-Water Sampling Form
HSL	Hazardous Substance List
HASP	Health and Safety Plan
ICP	Inductively Coupled Plasma Emission
ID	Inner Diameter
IDL	Instrument Detection Limit
IRM	Interim Remedial Measure

K	Hydraulic Conductivity
L	Liters
LCS	Laboratory Control Sample
LEL	Lower Explosive Limit
LFB	Laboratory Fortified Blank
LUNR	Land Use and Natural Resources Inventory
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goals
MDL	Method Detection Limit
mg/kg	Milligram Per Kilogram
mg/L	Milligrams Per Liter
ml	Milliliter
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MSA	Method of Standard Addition
NGVD	National Geodetic Vertical Datum of 1929
NYCRR	Official Compilation of Codes, Rules and Regulations of the State of New York
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OVA	Organic Vapor Analyzer
oz.	Ounce
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
pcf	Pounds Per Cubic Foot
PID	Photoionization Detector
POTW	Publicly Owned Treatment Works
ppb	Parts Per Billion
ppm	Parts Per Million
PRP	Potentially Responsible Party
PSD	Particle Size Distribution
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RA	Risk Assessment
RAO	Remedial Action Objective
RAS	Routine Analytical Services
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation

RI/FS	Remedial Investigation/Feasibility Study
RPD	Relative Percent Difference
RRF	Relative Response Factor
RRT	Relative Retention Time
RSD	Relative Standard Deviation
SAP	Sampling and Analysis Plan
SAR	Sample Analysis Request
SCAN	Selected Ion Monitoring
SCS	Soil Conservation Service
SDG	Sample Delivery Group
SOPs	Standard Operating Procedures
SOW	Statements of Work
SPDES	State Pollutant Discharge Elimination System
STAR	Stability Array
SVOCs	Semivolatile Organic Compounds
TAGM	Technical Administrative Guidance Memorandum
TCE	Trichloroethene
TCL/TAL	Target Compound List/Target Analyte List
TCLP	Toxicity Characteristic Leaching Procedures
TDS	Total Dissolved Solids
TIC	Tentatively Identified Compound
TOC	Total Organic Carbon
TSS	Total Suspended Solids
TVS	Total Volatile Solids
ug/L	Microgram Per Liter
umhos	Micromhos
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground Storage Tank
VOCCS	Volatile Organic Compound Canister Sampler
VOCs	Volatile Organic Compounds

Tables

Ground-Water Elevation Data

TABLE 1

GROUND-WATER ELEVATION DATA

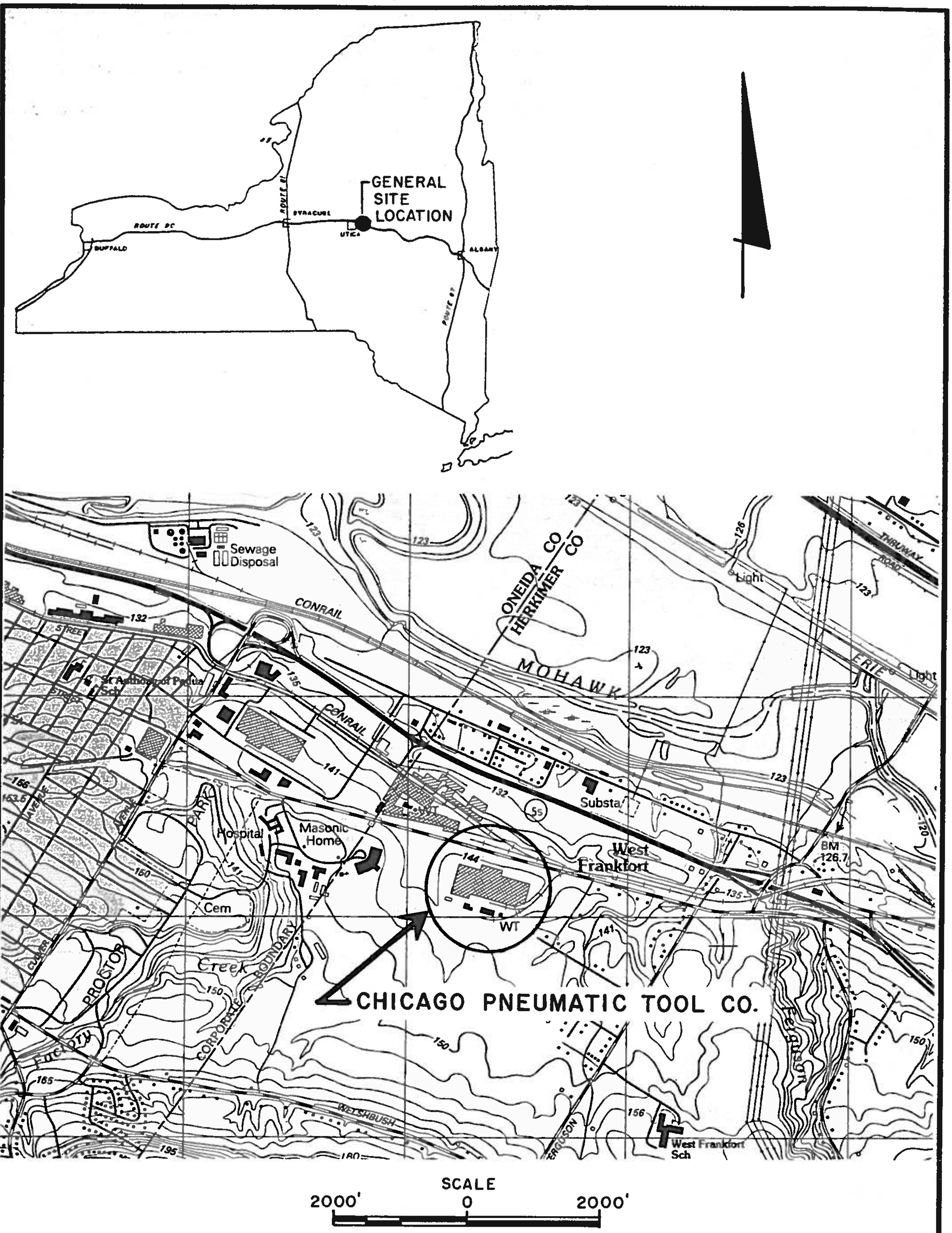
CHICAGO PNEUMATIC TOOL COMPANY
FRANKFORT, NEW YORK

Well Number	Top of Well Elevation	Ground Elevation	Ground-Water Elevations			
			01/03/94	04/05/94	12/07/94	01/17/95
MW-1	479.75	477.77	476.35	477.21	477.35	477.25
MW-3	474.56	474.84	467.58	467.94	467.81	467.85
MW-2D	474.76	NA	NA	NA	471.55	471.34
MW-4	470.21	470.43	464.31	NA	469.51	469.71
MW-5	474.57	472.12	469.89	471.60	470.47	470.95
MW-6R	462.43	462.74	460.90	460.86	460.63	461.90
MW-6D	462.21	462.60	457.49	458.12	458.17	459.59
MW-7	469.27	469.50	464.29	467.05	465.40	466.44
MW-7D	469.24	469.44	461.08	463.82	463.19	464.22
MW-8	477.72	475.59	473.71	474.53	474.92	474.87
MW-9	477.23	475.03	472.67	473.47	473.63	473.62
MW-9D	477.39	474.95	472.46	473.60	473.44	473.41
MW-10	478.92	476.74	476.42	476.64	476.65	476.57
MW-10D	478.49	476.76	473.48	474.36	474.22	474.15
MW-11	474.10	471.72	468.68	468.73	468.99	468.90
MW-12	470.90	471.38	464.44	466.16	465.48	466.69
MW-13	469.90	467.79	466.29	466.95	466.00	466.53
MW-13D	469.93	467.96	464.89	465.95	465.12	465.38
MW-14	478.28	475.82	474.38	475.30	475.20	475.28
MW-15	468.00	468.30	464.27	466.85	465.55	466.38
MW-15D	466.92	NA	NA	NA	465.46	465.60
Staff Gauge	468.05	NA	NA	NA	NA	468.05

Notes:
All elevations are in feet, based on the NGVD of 1988.
NA = Not available.

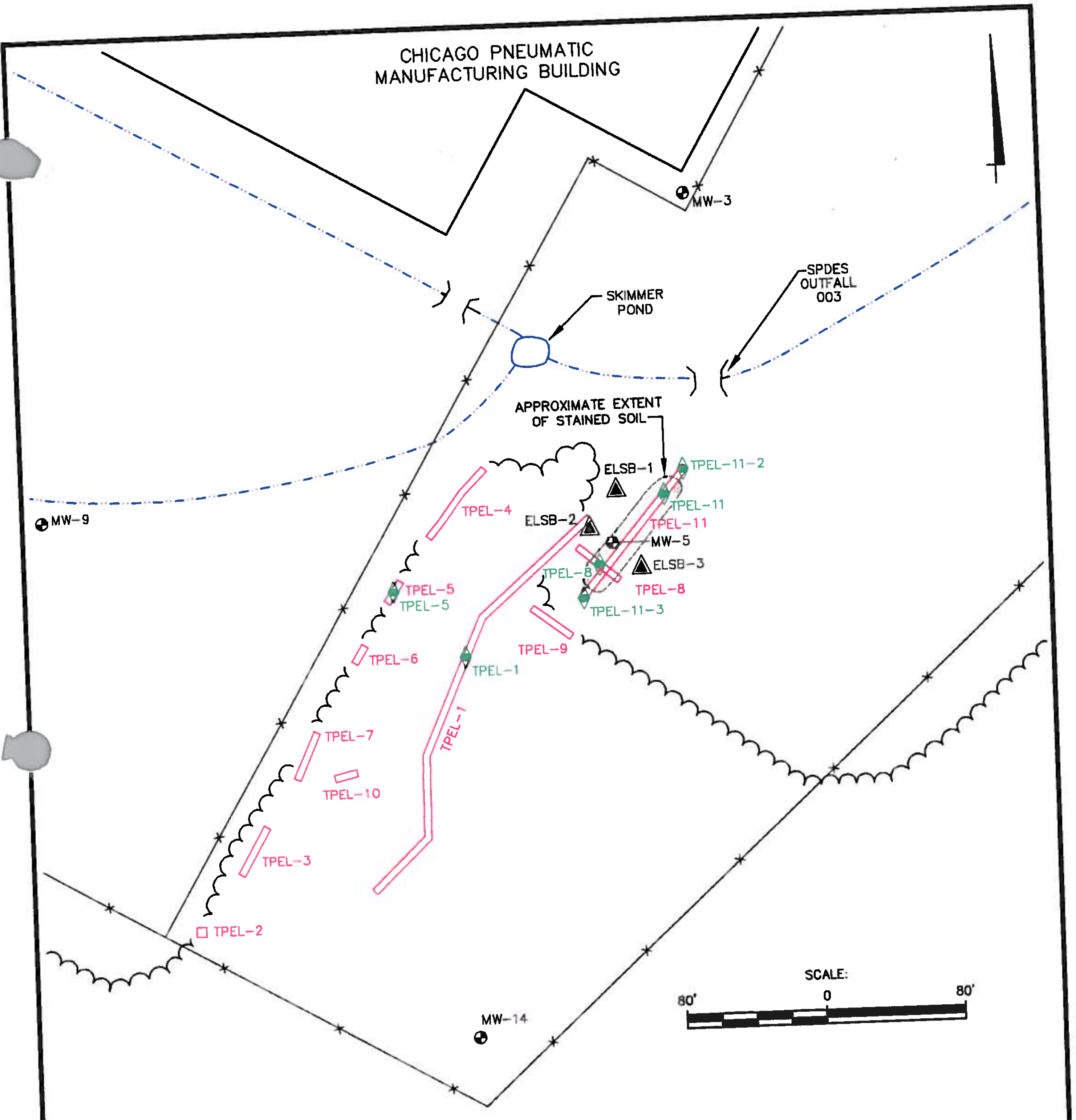
Figures

FIGURE 1



SITE LOCATION MAP

BLASLAND & BOUCK ENGINEERS, P.C.
ENGINEERS & GEOSCIENTISTS



LEGEND

MONITORING WELL

SOIL BORING

TEST PIT

SOIL SAMPLE

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

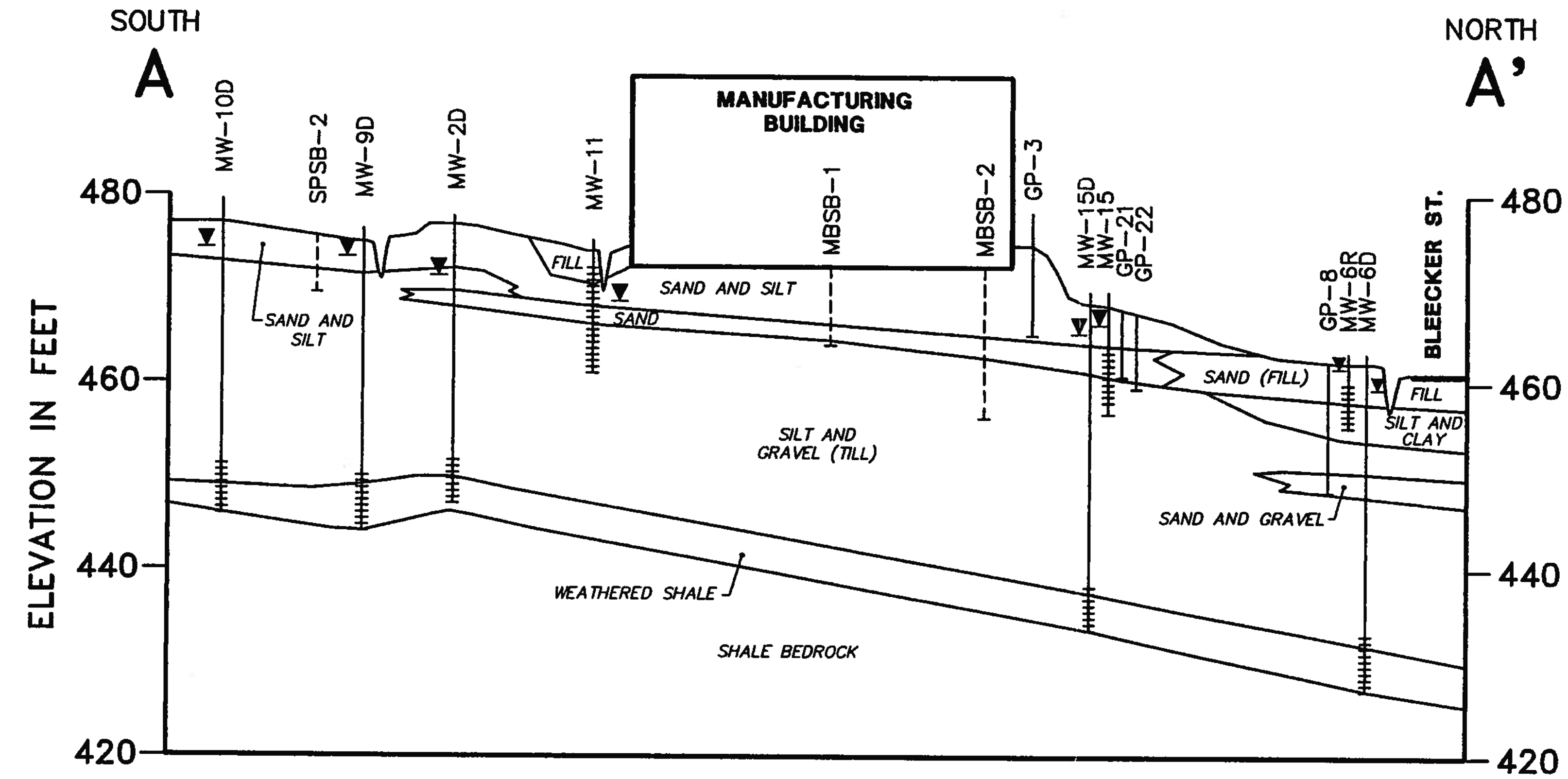
CHICAGO PNEUMATIC TOOL CO.
FRANKFORT, NEW YORK

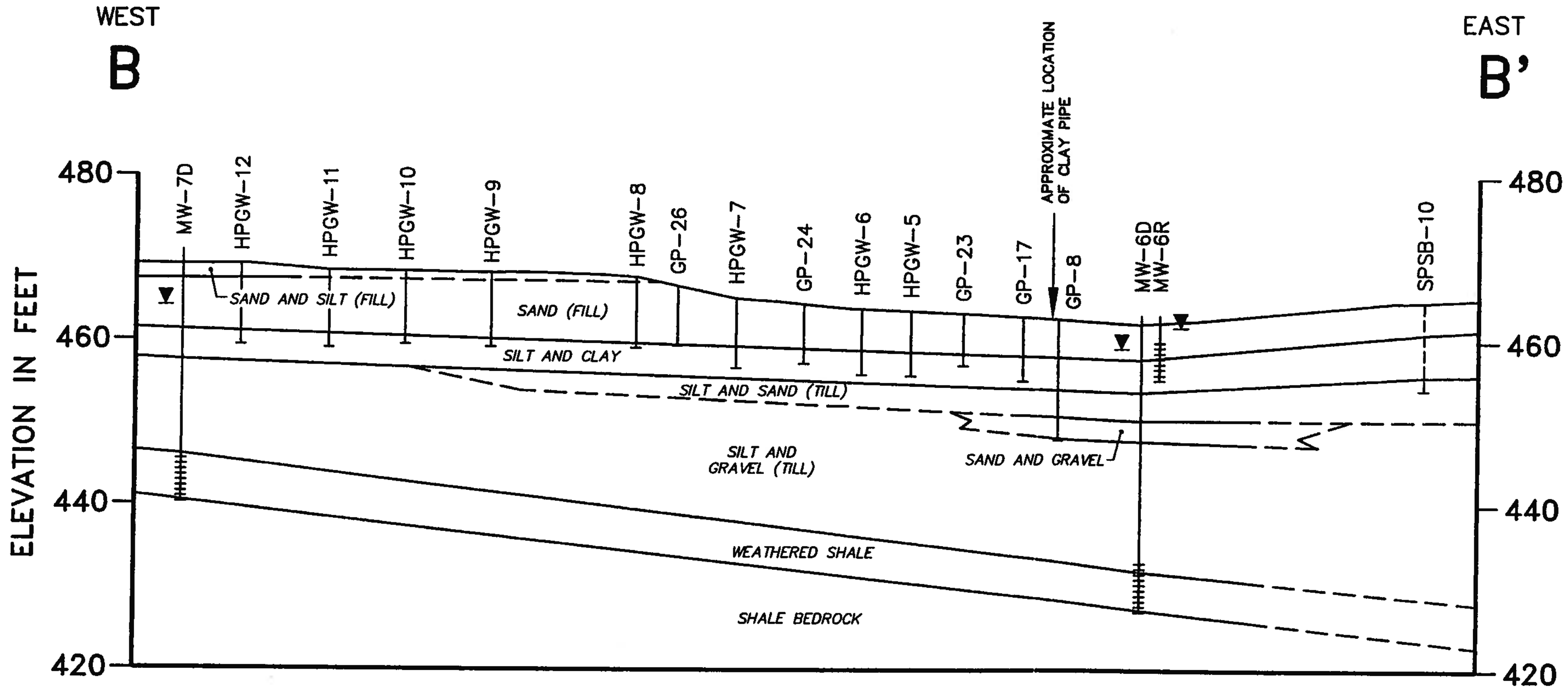
SUPPLEMENTAL RI ADDENDUM

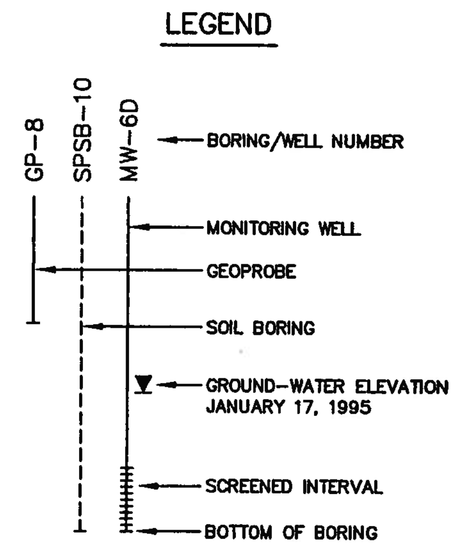
EAST LOT TEST PIT LOCATIONS

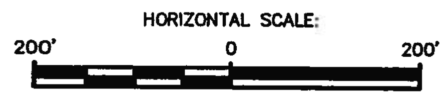
FIGURE
2A

12/14/95 54-DMW
3070860R\30708S19.DWG









2/22/95 54-DMW
3070860R\30708CSA.DWG

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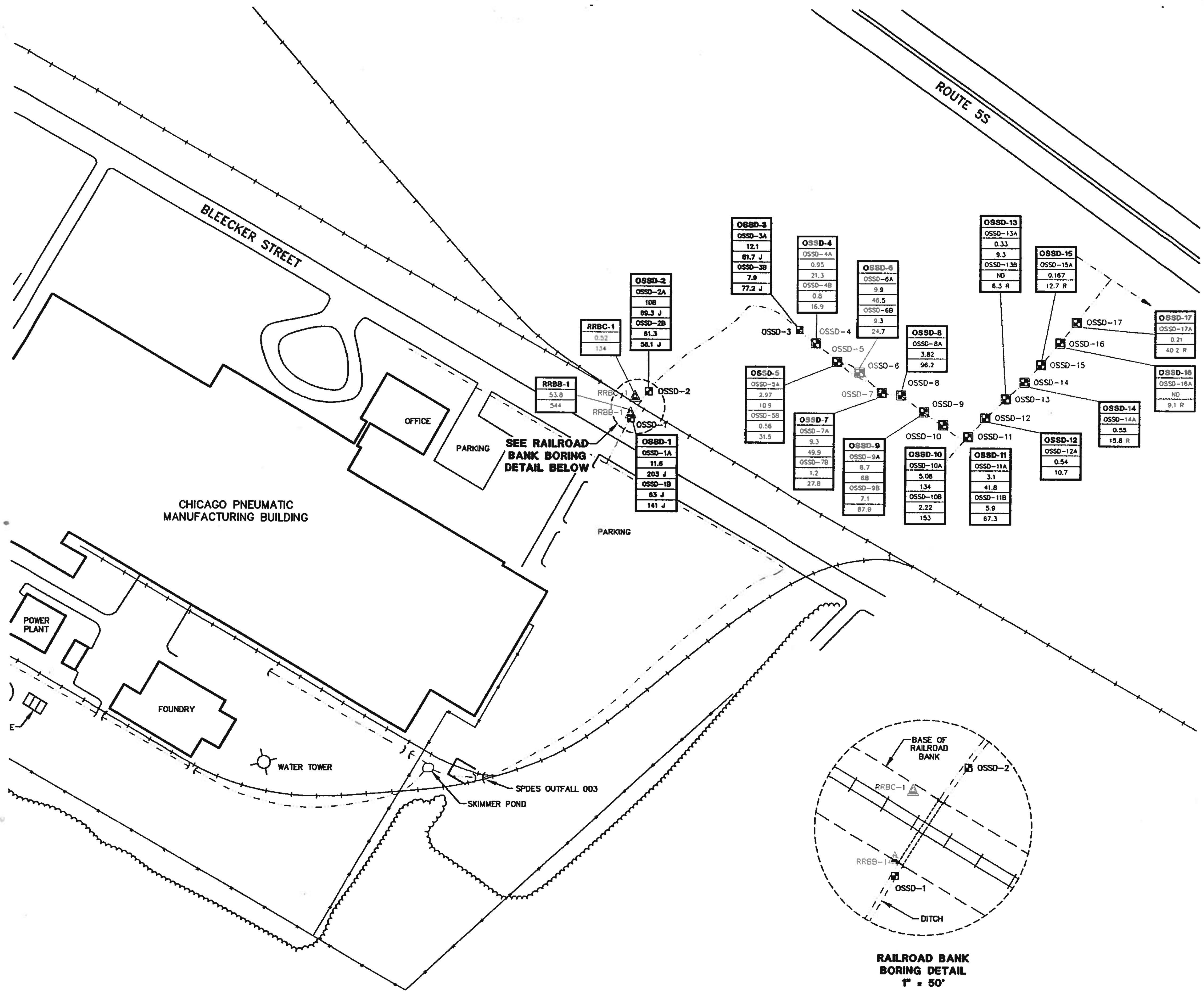
CHICAGO PNEUMATIC TOOL CO.
FRANKFORT, NEW YORK
SUPPLEMENTAL RI

GEOLOGIC CROSS SECTIONS A-A' AND B-B'

FIGURE 3



SUPSED.SED
3/29/95 54-DMW
3070660R\30706S11.DWG

LEGEND

- ABANDONED RAILROAD TRACKS (APPROXIMATE LOCATION)
- 1993 RI SEDIMENT SAMPLING LOCATION
- 1994 SUPPLEMENTAL RI SEDIMENT SAMPLING LOCATION
- SUPPLEMENTAL SURFACE SOIL SAMPLE

SEDIMENT SAMPLE RESULTS (ppm)

OSSD-11	SEDIMENT SAMPLE NUMBER
OSSD-11A	SAMPLE I.D. (0-6" DEPTH)
3.1	TOTAL PCB's
41.8	LEAD
OSSD-11B	SAMPLE I.D. (6-12" DEPTH)
5.9	TOTAL PCB's
67.3	LEAD
ND	NOT DETECTED
R	RESULT REJECTED BASED ON DATA VALIDATION

NOTE: LOCATIONS NORTH OF BLEEKER STREET WERE DIGITIZED FROM TOWN OF FRANKFORT, HERKIMER COUNTY, NEW YORK TAX MAP, DATED 12/6/78 AND FIELD OBSERVATIONS AND ARE APPROXIMATE.

SCALE:
200' 0 200'

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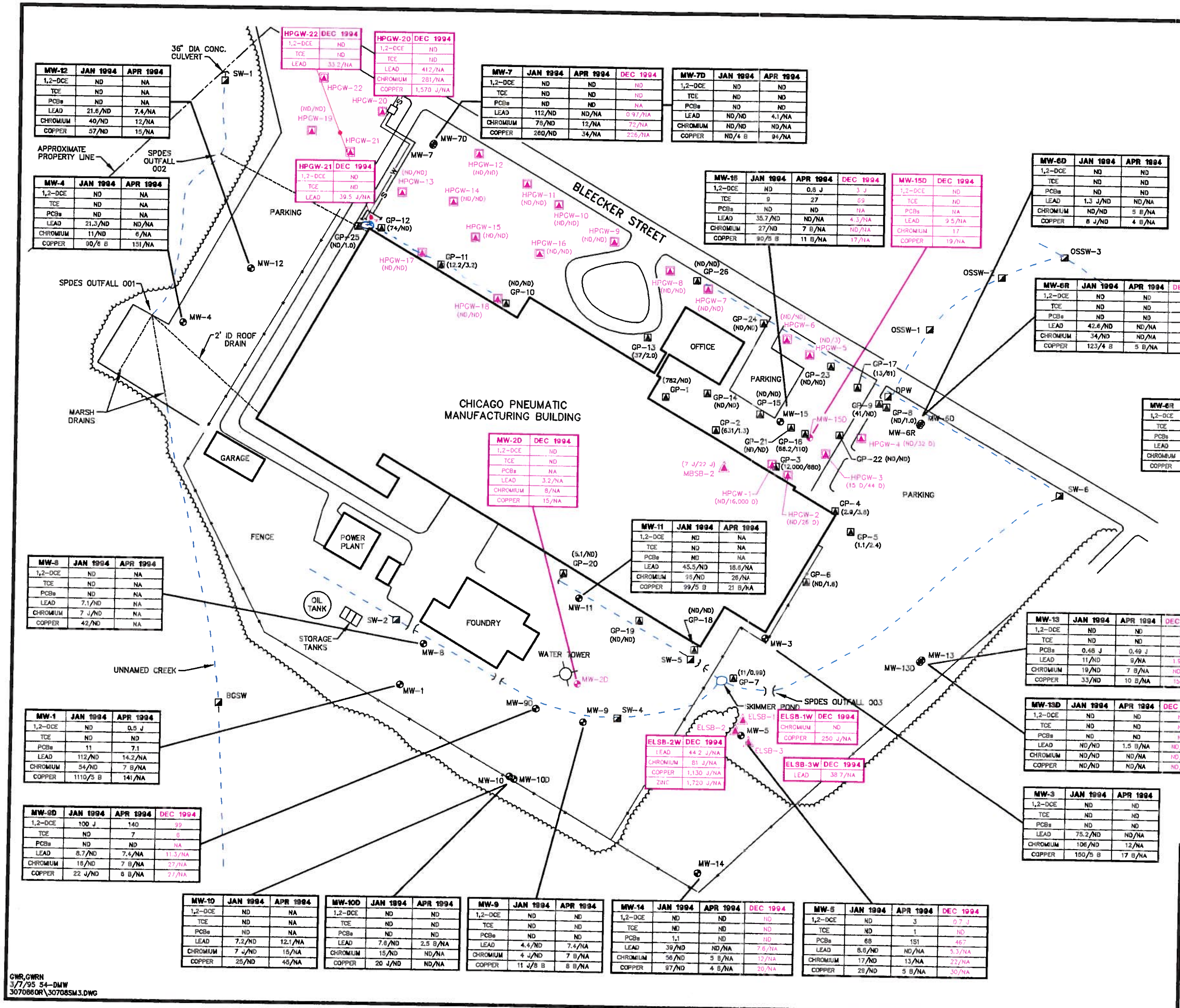
ENGINEERS & SCIENTISTS

CHICAGO PNEUMATIC TOOL CO.
FRANKFORT, NEW YORK

SUPPLEMENTAL RI

OFF-SITE SEDIMENT SAMPLE LOCATIONS

FIGURE 4



MW-12	JAN 1994	APR 1994
1,2-DCE	ND	NA
TCE	ND	NA
PCBs	ND	NA
LEAD	21.6/ND	7.4/NA
CHROMIUM	40/ND	12/NA
COPPER	57/ND	15/NA

MW-4	JAN 1994	APR 1994
1,2-DCE	ND	NA
TCE	ND	NA
PCBs	ND	NA
LEAD	21.3/ND	ND/NA
CHROMIUM	11/ND	6/NA
COPPER	90/6 B	151/NA

HPGW-22	DEC 1994
1,2-DCE	ND
TCE	ND
LEAD	33.2/NA

HPGW-21	DEC 1994
1,2-DCE	ND
TCE	ND
LEAD	39.5 J/NA

HPGW-20	DEC 1994
1,2-DCE	ND
TCE	ND
LEAD	412/NA
CHROMIUM	281/NA
COPPER	1,570 J/NA

MW-7	JAN 1994	APR 1994	DEC 1994
1,2-DCE	ND	ND	ND
TCE	ND	ND	ND
PCBs	ND	ND	NA
LEAD	112/ND	ND/NA	0.97/NA
CHROMIUM	76/ND	12/NA	72/NA
COPPER	260/ND	34/NA	226/NA

MW-7D	JAN 1994	APR 1994
1,2-DCE	ND	ND
TCE	ND	ND
PCBs	ND	ND
LEAD	ND/ND	4.1/NA
CHROMIUM	ND/ND	ND/NA
COPPER	ND/4 B	94/NA

MW-15	JAN 1994	APR 1994	DEC 1994
1,2-DCE	ND	0.6 J	3 J
TCE	9	27	69
PCBs	ND	ND	NA
LEAD	35.7/ND	ND/NA	4.3/NA
CHROMIUM	27/ND	7 B/NA	ND/NA
COPPER	90/5 B	11 B/NA	17/NA

MW-15D	DEC 1994
1,2-DCE	ND
TCE	ND
PCBs	NA
LEAD	9.5/NA
CHROMIUM	17
COPPER	19/NA

MW-6D	JAN 1994	APR 1994
1,2-DCE	ND	ND
TCE	ND	ND
PCBs	ND	ND
LEAD	1.3 J/ND	ND/NA
CHROMIUM	ND/ND	5 B/NA
COPPER	8 J/ND	4 B/NA

MW-6R	JAN 1994	APR 1994	DEC 1994
1,2-DCE	ND	ND	ND
TCE	ND	ND	ND
PCBs	ND	ND	NA
LEAD	42.6/ND	ND/NA	8.8/NA
CHROMIUM	34/ND	ND/NA	8/NA
COPPER	123/4 B	5 B/NA	26/NA

MW-2D	DEC 1994
1,2-DCE	ND
TCE	ND
PCBs	NA
LEAD	3.2/NA
CHROMIUM	8/NA
COPPER	15/NA

MW-11	JAN 1994	APR 1994
1,2-DCE	ND	NA
TCE	ND	NA
PCBs	ND	NA
LEAD	45.5/ND	18.6/NA
CHROMIUM	98/ND	26/NA
COPPER	99/5 B	21 B/NA

MW-8	JAN 1994	APR 1994
1,2-DCE	ND	NA
TCE	ND	NA
PCBs	ND	NA
LEAD	7.1/ND	NA
CHROMIUM	7 J/ND	NA
COPPER	42/ND	NA

MW-1	JAN 1994	APR 1994
1,2-DCE	ND	0.5 J
TCE	ND	ND
PCBs	11	7.1
LEAD	112/ND	14.2/NA
CHROMIUM	54/ND	7.8/NA
COPPER	1110/5 B	141/NA

MW-9D	JAN 1994	APR 1994	DEC 1994
1,2-DCE	100 J	140	99
TCE	ND	7	8
PCBs	ND	ND	NA
LEAD	8.7/ND	7.4/NA	11.3/NA
CHROMIUM	18/ND	7 B/NA	27/NA
COPPER	22 J/ND	6 B/NA	27/NA

MW-10	JAN 1994	APR 1994
1,2-DCE	ND	NA
TCE	ND	NA
PCBs	ND	NA
LEAD	7.2/ND	12.1/NA
CHROMIUM	7 J/ND	15/NA
COPPER	25/ND	45/NA

MW-10D	JAN 1994	APR 1994
1,2-DCE	ND	ND
TCE	ND	ND
PCBs	ND	ND
LEAD	7.6/ND	2.5 B/NA
CHROMIUM	15/ND	ND/NA
COPPER	20 J/ND	ND/NA

MW-9	JAN 1994	APR 1994
1,2-DCE	ND	ND
TCE	ND	ND
PCBs	ND	ND
LEAD	4.4/ND	7.4/NA
CHROMIUM	4 J/ND	7 B/NA
COPPER	11 J/8 B	8 B/NA

MW-14	JAN 1994	APR 1994	DEC 1994
1,2-DCE	ND	ND	ND
TCE	ND	ND	ND
PCBs	1.1	ND	ND
LEAD	39/ND	ND/NA	7.6/NA
CHROMIUM	56/ND	5 B/NA	12/NA
COPPER	97/ND	4 B/NA	20/NA

MW-5	JAN 1994	APR 1994	DEC 1994
1,2-DCE	ND	3	0.7 J
TCE	ND	1	ND
PCBs	68	151	467
LEAD	6.6/ND	ND/NA	5.3/NA
CHROMIUM	17/ND	13/NA	22/NA
COPPER	29/ND	5 B/NA	30/NA

ELSB-2W	DEC 1994
LEAD	44.2 J/NA
CHROMIUM	81 J/NA
COPPER	1,130 J/NA
ZINC	1,720 J/NA

ELSB-1W	DEC 1994
CHROMIUM	ND
COPPER	250 J/NA

ELSB-3W	DEC 1994
LEAD	38.7/NA

MW-13	JAN 1994	APR 1994	DEC 1994
1,2-DCE	ND	ND	ND
TCE	ND	ND	ND
PCBs	0.48 J	0.49 J	ND
LEAD	11/ND	9/NA	1.9/NA
CHROMIUM	19/ND	7 B/NA	ND/NA
COPPER	33/ND	10 B/NA	15/NA

MW-13D	JAN 1994	APR 1994	DEC 1994
1,2-DCE	ND	ND	ND
TCE	ND	ND	ND
PCBs	ND	ND	ND
LEAD	ND/ND	1.5 B/NA	ND/NA
CHROMIUM	ND/ND	ND/NA	ND/NA
COPPER	ND/ND	ND/NA	ND/NA

MW-3	JAN 1994	APR 1994
1,2-DCE	ND	ND
TCE	ND	ND
PCBs	ND	ND
LEAD	75.2/ND	ND/NA
CHROMIUM	106/ND	12/NA
COPPER	150/5 B	17 B/NA

LEGEND

- MONITORING WELL
- GEOPROBE SAMPLE
- SURFACE WATER SAMPLE
- SUPPLEMENTAL SOIL BORING
- HYDROPUNCH SAMPLE LOCATION

CHEMICAL CONCENTRATIONS IN GROUND WATER (ppb):

MW-6R	JAN 1994	APR 1994	DEC 1994	
1,2-DCE	ND	ND	ND	MONITORING WELL NUMBER/SAMPLE DATE
TCE	ND	ND	ND	1,2-DICHLOROETHENE
PCBs	ND	ND	NA	TRICHLOROETHENE
LEAD	42.6/ND	ND/NA	8.8/NA	POLYCHLORINATED BIPHENOLS (AROCLOR-1254)
CHROMIUM	34/ND	ND/NA	8/NA	LEAD (TOTAL/DISSOLVED)
COPPER	123/4 B	5 B/NA	26/NA	CHROMIUM (TOTAL/DISSOLVED)
				COPPER (TOTAL/DISSOLVED)

- ND — NOT DETECTED
- J — ESTIMATED CONCENTRATION: DETECTED BELOW THE MINIMUM QUANTITATION LIMIT, OR AS DETERMINED BY VALIDATION
- B — COMPOUND DETECTED IN THE BLANK AS WELL AS IN THE SAMPLE
- D — SAMPLE ANALYZED AT A SECONDARY DILUTION
- NA — NOT ANALYZED
- (1.1/2.4) — 1,2 DICHLOROETHENE AND TRICHLOROETHENE CONCENTRATIONS (ppb) DETECTED IN GROUND-WATER SAMPLES COLLECTED FROM GEOPROBES (APRIL 1994)
- (1.1/2.4) — 1,2 DICHLOROETHENE AND TRICHLOROETHENE CONCENTRATIONS (ppb) DETECTED IN GROUND-WATER SAMPLES COLLECTED FROM HYDROPUNCH SAMPLES (DEC 1994)
- SANITARY SEWER (APPROXIMATE LOCATION)
- —S— FIRE SPRINKLER PIPE (APPROXIMATE LOCATION)
- —W— POTABLE WATER PIPE (APPROXIMATE LOCATION)

SCALE: 200' 0 200'

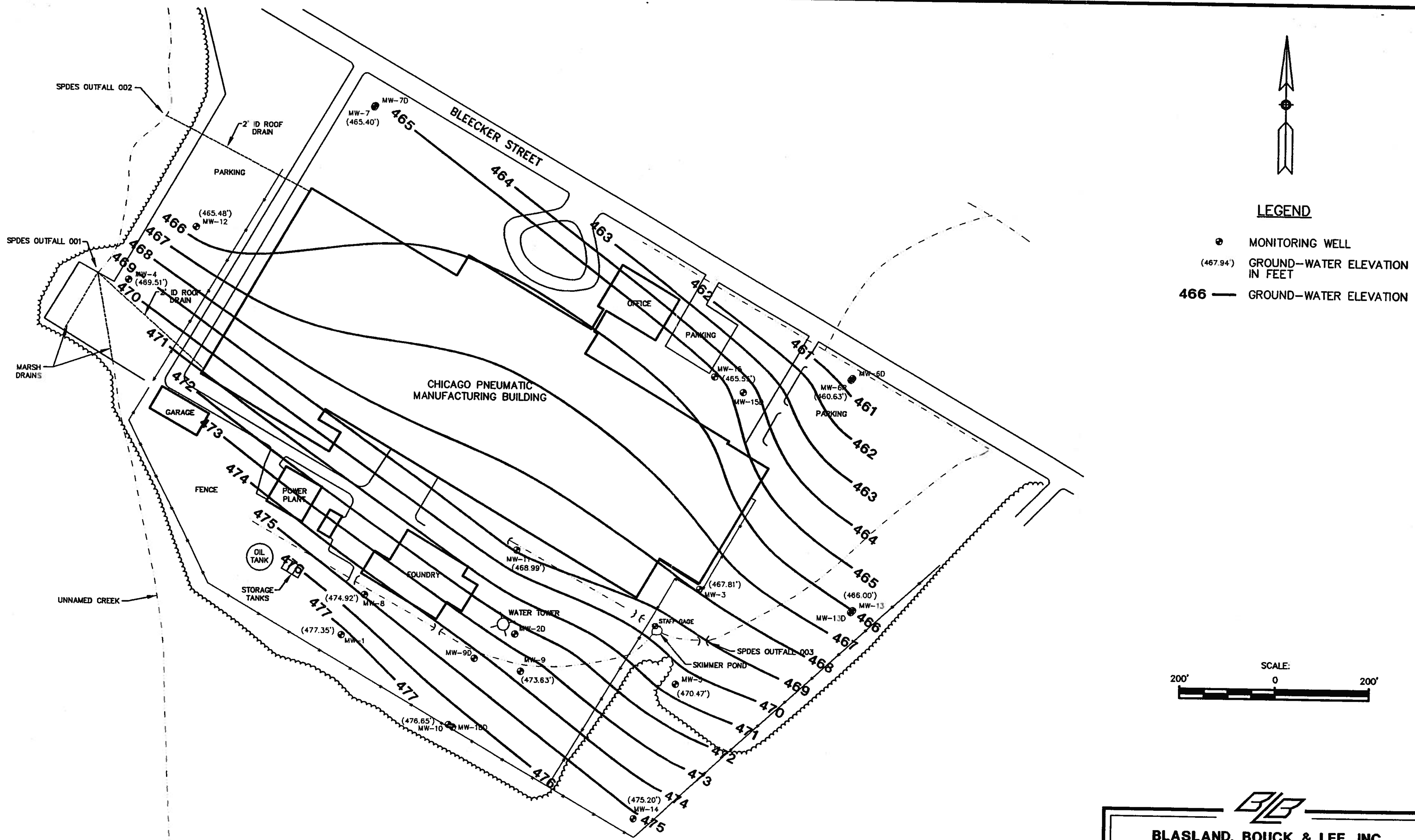
BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

CHICAGO PNEUMATIC TOOL CO.
FRANKFORT, NEW YORK
SUPPLEMENTAL RI

CHEMICAL DISTRIBUTION IN GROUND WATER

FIGURE 5

GWR,GWRN
3/7/95 54-DMW
30708GR\30708SM3.DWG



GW1294S
2/8/95 54-DMW
3070860R\30708S12.DWG

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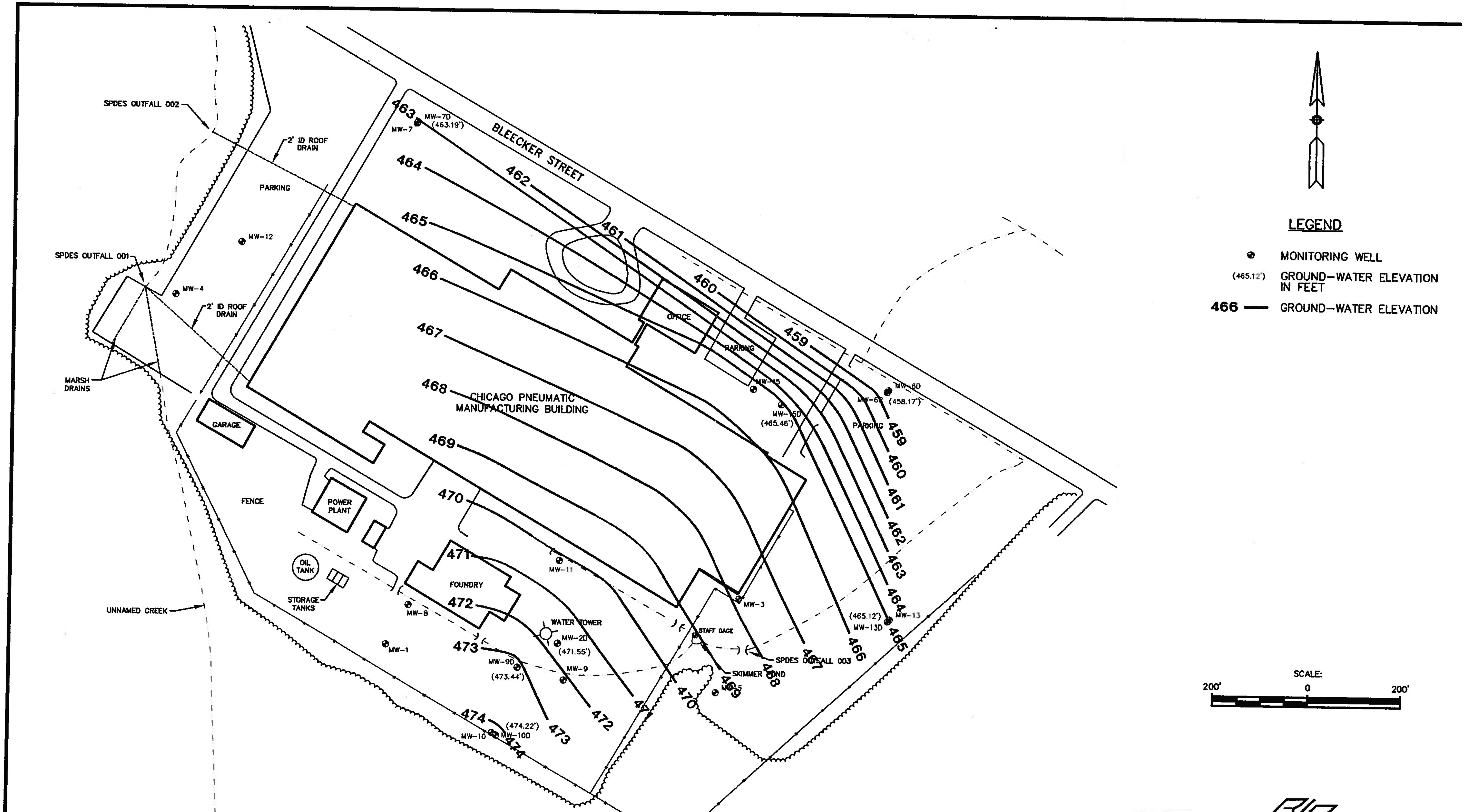
FRANKFORT, NEW YORK
SUPPLEMENTAL RI/FS

OVERBURDEN GROUND-WATER ELEVATION CONTOUR MAP
12-7-94

FIGURE 6



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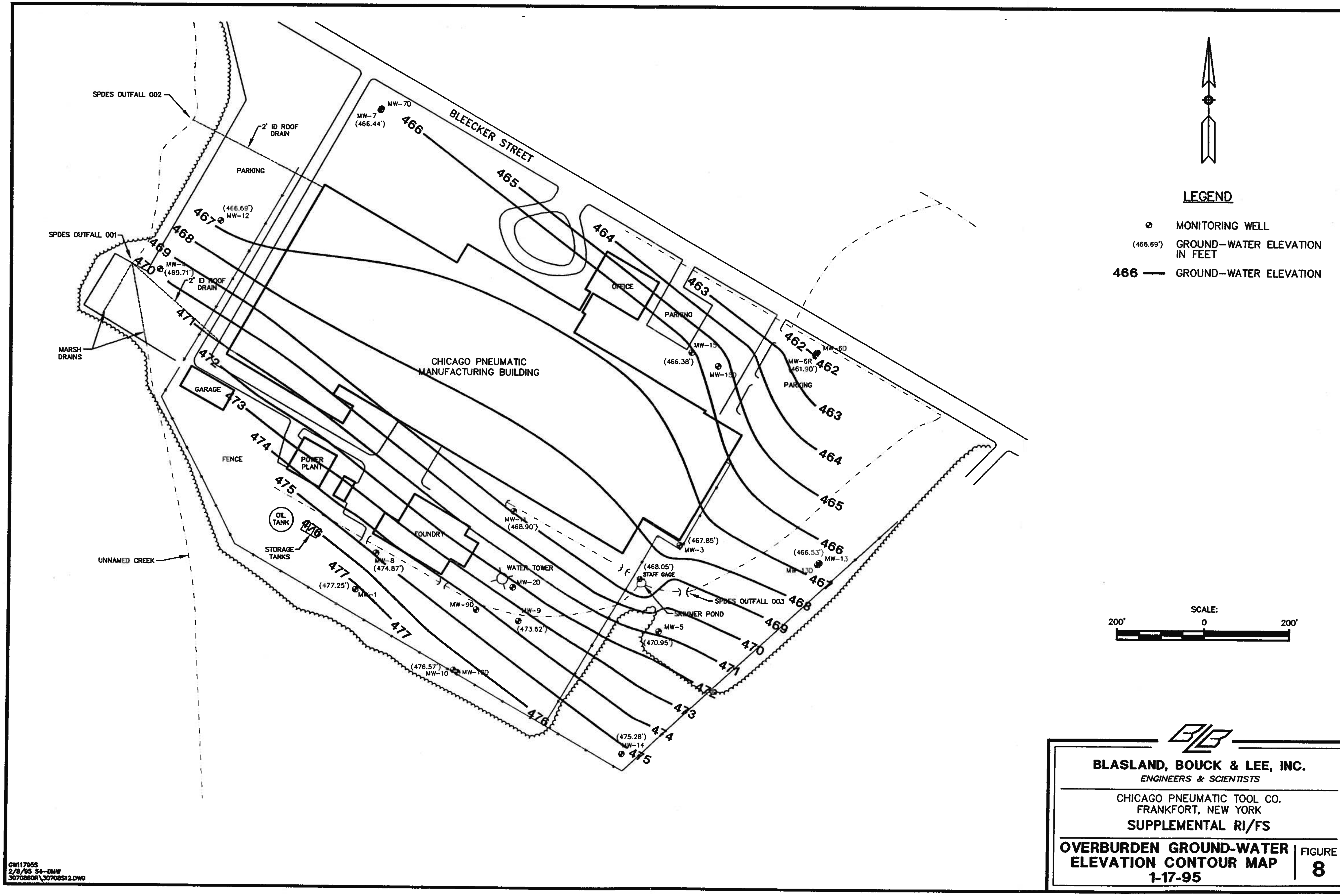
SUPPLEMENTAL RI/FS

BEDROCK GROUND-WATER ELEVATION CONTOUR MAP 12-7-94

FIGURE 7



BLEECKER STREET
CHICAGO PNEUMATIC MANUFACTURING BUILDING
SPDES OUTFALL 002
SPDES OUTFALL 001
SPDES OUTFALL 003
2' ID ROOF DRAIN
PARKING
MARSH DRAINS
UNNAMED CREEK
GARAGE
FENCE
POWER PLANT
OIL TANK
STORAGE TANKS
FOUNDRY
WATER TOWER
STAFF GAGE
SKIMMER POND
OFFICE
MW-7D
MW-7 (466.44')
MW-12 (466.69')
MW-4 (469.71')
MW-15 (466.38')
MW-15D
MW-6D
MW-6R (461.90')
MW-11 (468.90')
MW-3 (467.85')
MW-13 (466.53')
MW-13D
MW-8 (474.87')
MW-2D
(468.05')
MW-1 (477.25')
MW-9D
MW-9 (473.62')
MW-5 (470.95')
MW-10 (476.57')
MW-10D
MW-14 (475.28')
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
LEGEND
MONITORING WELL
(466.69') GROUND-WATER ELEVATION IN FEET
466 GROUND-WATER ELEVATION
SCALE:
200' 0 200'
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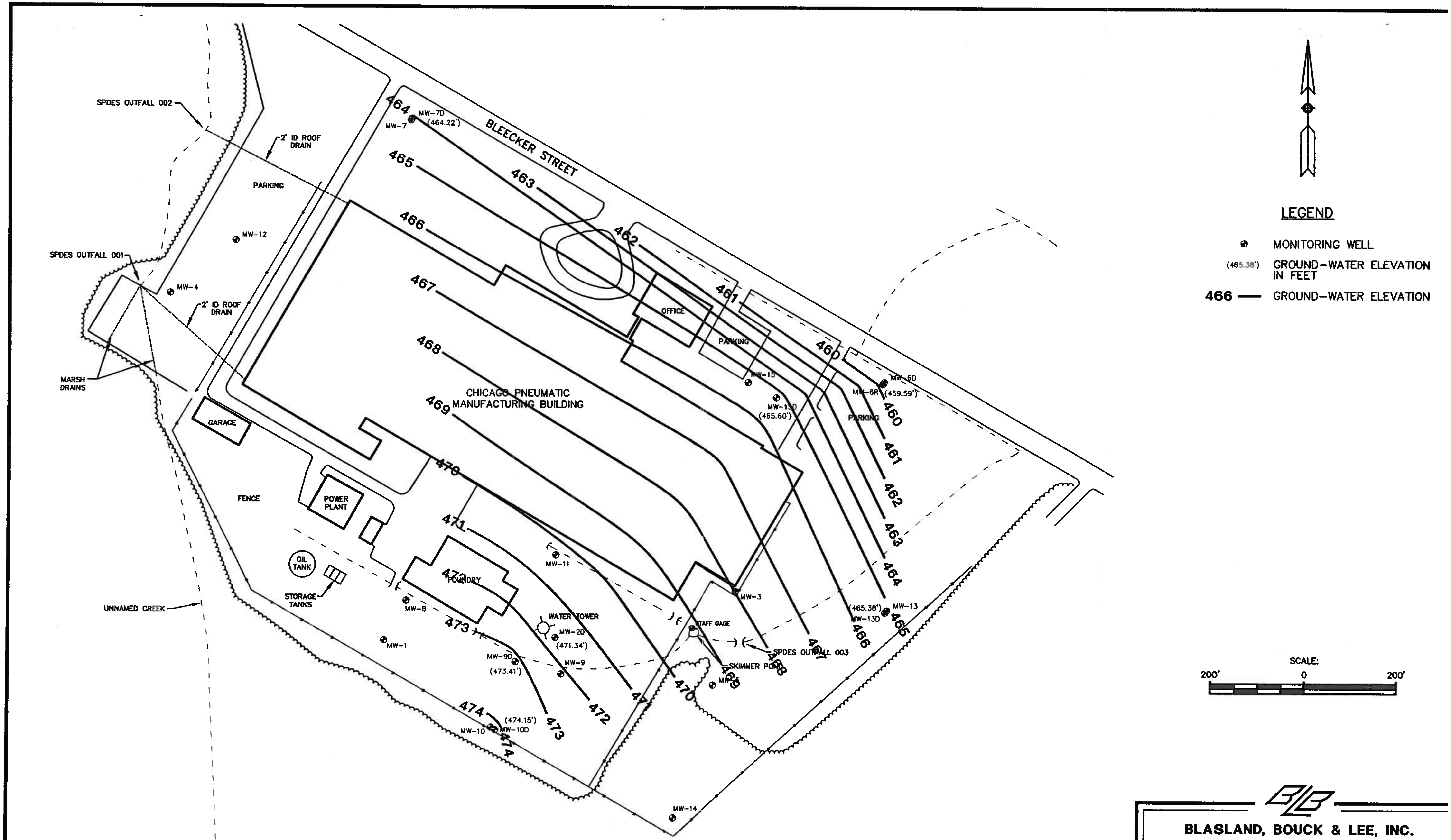
CHICAGO PNEUMATIC TOOL CO.
FRANKFORT, NEW YORK
SUPPLEMENTAL RI/FS
OVERBURDEN GROUND-WATER ELEVATION CONTOUR MAP
1-17-95
FIGURE 8
GW11795S
2/8/95 54-DMW
3070860R\30708S12.DWG



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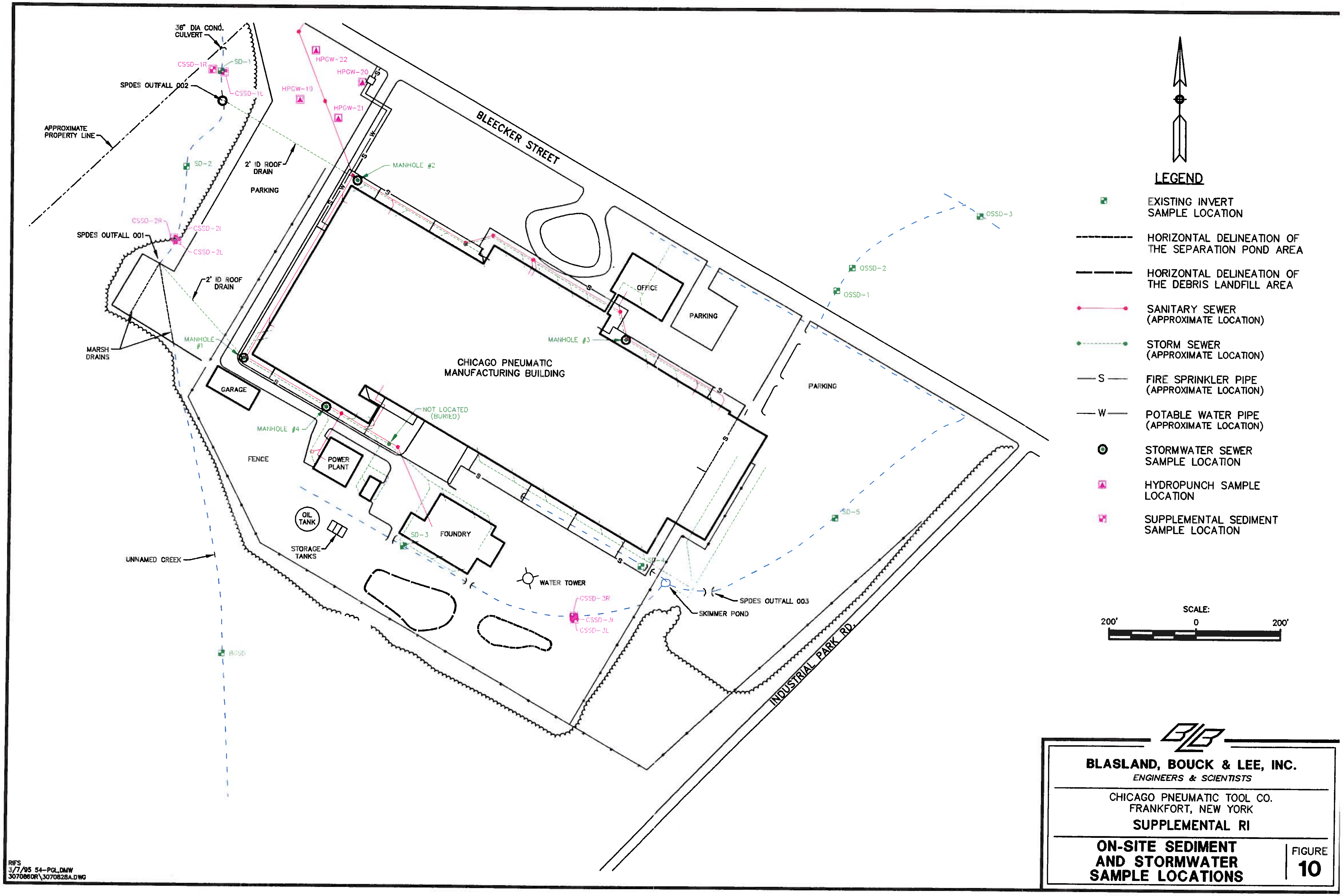
SUPPLEMENTAL RI/FS

BEDROCK GROUND-WATER ELEVATION CONTOUR MAP 1-17-95

FIGURE **9**

GW11795D
2/8/95 54-DMW
3070860R\30708S12.DWG



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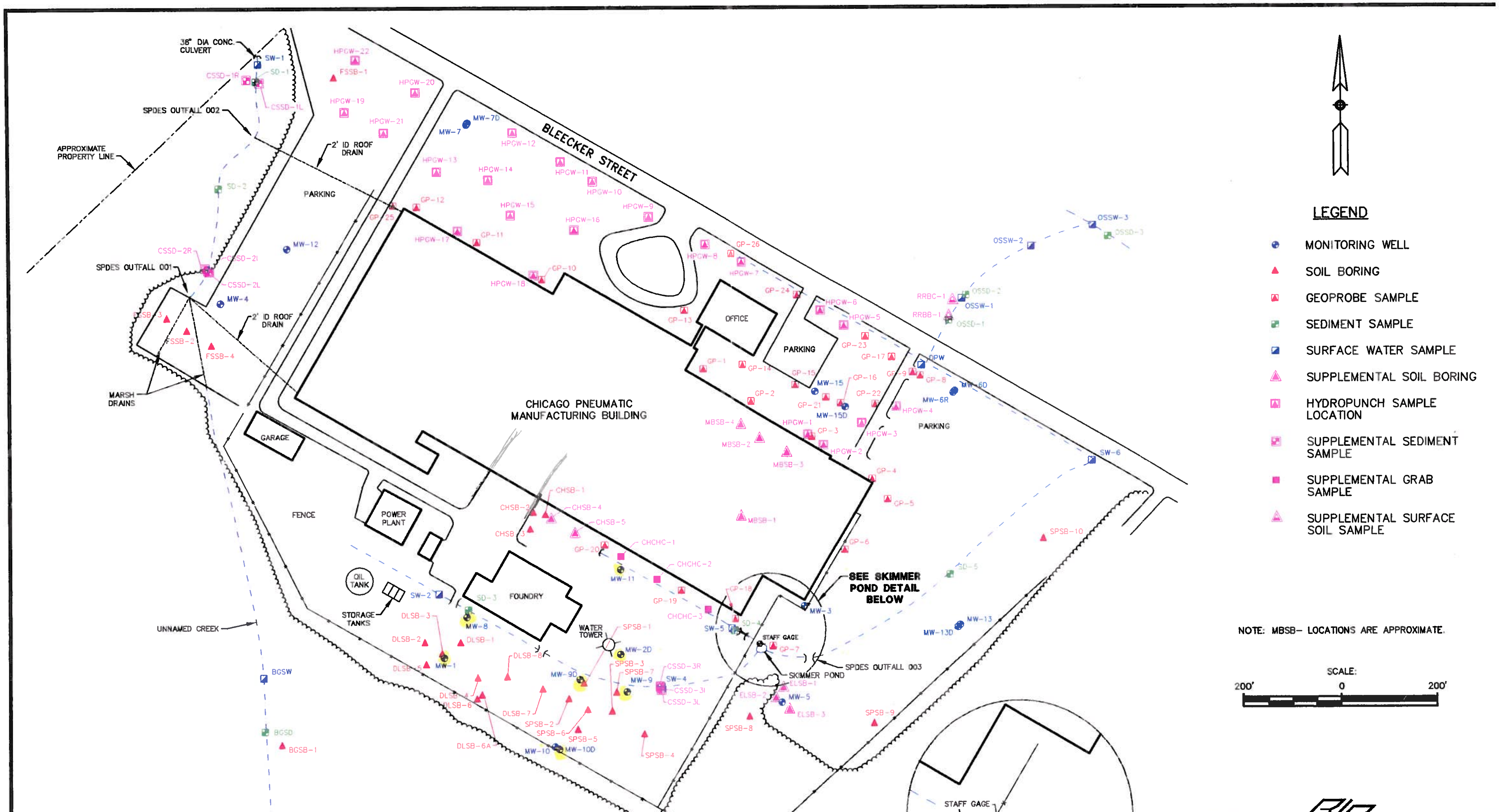
SUPPLEMENTAL RI

ON-SITE SEDIMENT AND STORMWATER SAMPLE LOCATIONS

FIGURE **10**



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CHICAGO PNEUMATIC TOOL CO.
FRANKFORT, NEW YORK
FEASIBILITY STUDY

RI SAMPLE LOCATIONS

FIGURE **2-1**