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FINAL STATEMENT OF BASIS

SELECTION OF FINAL CORRECTIVE MEASURES FOR KODAK PARK INVESTIGATION AREA SIA-502/605 EASTMAN KODAK COMPANY

Kodak Park
City of Rochester/Town of Greece, Monroe County, New York

November 2009

The New York State Department of Environmental Conservation (Department) has selected Final Corrective Measures to address the presence of contaminated media at the site identified as SIA-502/605, located at the Kodak Park Facility, in Rochester, New York. The draft statement of basis document was public-noticed from September 23, 2009 to November 9, 2009. The Department did not receive any comments on the proposed remedy during the comment period.

Therefore, the proposed remedy has been selected as the final remedy for this investigation area. The Final Statement of Basis, dated November 2009, shall be implemented by Eastman Kodak as the Selected Final Corrective Measures for SIA-502/605.

Date: 11/13/09

By: E Dassatti
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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID & HAZARDOUS MATERIALS

STATEMENT OF BASIS
FOR
KODAK PARK INVESTIGATION AREA SIA-502/605

FINAL
November 2009

FACILITY: **Eastman Kodak Company**
Kodak Park
ROCHESTER, NEW YORK
MONROE COUNTY

USEPA ID No.: NYD980592497
NYSDEC Permit No.: 8-2614-00205/00104-0

Table of Contents

1.0 INTRODUCTION. 1

2.0 FACILITY BACKGROUND. 2

3.0 SOLID WASTE MANAGEMENT UNITS.. 3

4.0 FACILITY INVESTIGATION RESULTS. 4

- 4.1 Historical Environmental Investigations. 4
- 4.2 Site Bedrock Geology/Hydrostratigraphy. 4
  - 4.2.1 Site Overburden Geology.. 5
- 4.3 Nature and Extent of Soil Contaminants. 5
  - 4.3.1 Volatile Organic Compounds. 6
  - 4.3.2 Semi-Volatile Organic Compounds.. 6
  - 4.3.3 Pesticides/Polychlorinated Biphenyls (PCBs). 6
  - 4.3.4 Inorganic Constituents. 7
  - 4.3.5 Non-Aqueous Phase Liquid (NAPL) Evaluation Results for Soils. 9
  - 4.3.6 Screening Level Risk Assessment for Soils.. 9
- 4.4 Groundwater. 10
  - 4.4.1 Overburden/TOR Hydrogeology. 10
  - 4.4.2 Nature and Extent of Groundwater Contaminants.. 10

5.0 IDENTIFICATION AND SCREENING OF REMEDIAL TECHNOLOGIES. 11

- 5.1 Potential Soil Remedial Technologies.. 11
  - 5.1.1 Excavation and Disposal. 11
  - 5.1.2 Treatment. 12
  - 5.1.3 Containment Technologies. 12
  - 5.1.4 Institutional Controls for Soils.. 14
  - 5.1.5 Soil Technology Screening Summary. 14
- 5.2 Potential Groundwater Remedial Technologies. 14
- 5.3 Assembly of Remedial Alternatives. 14

6.0 EVALUATION OF CORRECTIVE MEASURES ALTERNATIVES. 15

- 6.1 Corrective Measures Evaluation Criteria.. 15
- 6.2 Evaluation of Alternative 1 - Excavation and Disposal of Impacted Soil and Institutional Controls for SWMU S-030. 16
- 6.3 Evaluation of Alternative 2 - Protective Soil Covering of Impacted Soils and Institutional Controls for SWMU S-030. 17

7.0 PROPOSED FINAL CORRECTIVE MEASURES. 18

Tables and Figures. 22-33

1.0 INTRODUCTION

The purpose of this Statement of Basis is to provide an opportunity for the public to be informed of and to participate in the selection of a final remedy that will protect human health and the environment from soil and groundwater contamination that is present at the investigation area SIA-502/605, located in the central portion of Kodak Park Section S (KPS), in Rochester, New York (see Figure 1). The investigation area is comprised of a grouping of solid waste management units (SWMUs) that were identified during the Resource Conservation and Recovery Act (RCRA) Facility Assessment. The SWMU grouping has been designated SIA-502/605. Note that the B-502/S-26 chlorinated solvent release site was identified and designated as SWMU S-091 after the main site investigation work had been completed. This release was discovered during the pre-Corrective Measures Study supplemental investigation, and is being managed as a separate project. The proposed remedy does not address SWMU S-091. This document:

- Provides a brief overview of the site history and site investigations which were conducted at SIA-502/605;
- Summarizes current and potential pathways of human exposure to contaminants in SIA-502/605;
- Describes the remedial goals that were considered;
- Identifies the proposed remedy and presents the basis for its selection; and
- Solicits public review and comment on selection of the proposed remedy.

The New York State Department of Environmental Conservation (NYSDEC or Department), in consultation with the New York State Department of Health, has tentatively selected a proposed remedy. Changes to the proposed remedy, or the selection of an alternative remedy may be made if public comments or additional data indicate that such changes are warranted. The Department will finalize remedy selection for the facility after the public comment period has ended and the comments have been reviewed and considered.

This document summarizes information that can be found in greater detail at the document repositories identified below. The Department encourages the public to review the documents at the repositories to gain a more comprehensive understanding of the environmental investigations and related activities that have been undertaken for SIA-502/605, and the possible remedies to address that contamination.

Proposed Remedy

The Department has identified two functionally equivalent remedial alternatives as suitable for the final remedy for SIA-502/605. The key difference between the alternatives is that one involves excavation and off-site disposal of contaminated soil while the other involves placement of protective soil cover over the contaminated soil. Each alternative is described in more detail below.

Alternative #1 consists of:

- excavation and off-site disposal of soil in areas of SWMU S-030 identified as having surficial soil screening level exceedances, to prevent exposure to contaminated soils.

- administrative controls for the impacted portion of SWMU S-030 area to address potential exposure to contaminated groundwater. This includes continued implementation of existing institutional controls (i.e., site access restrictions) and adding deed restrictions to limit the future use and development of the impacted area to commercial and industrial uses only. This will include a restriction preventing the future use of groundwater as a source of potable water. The potential for vapor intrusion to indoor air must be evaluated prior to any new construction or change in use of the impacted portion of SWMU S-030 involving the construction of an occupied structure. And,

- annual certification by the property owner that the institutional controls and engineering controls are in place and continue to be effective.

Alternative #2 consists of:

- placement of a protective soil cover in areas of SWMU S-030 identified as having surficial soil screening level exceedances to prevent exposure to contaminated soils. The protective soil cover would consist of a geotextile fabric as a visual marker layer; approximately 20-inches of compacted fill (uncontaminated soil and/or crushed demolition debris); and then, 6 inches of topsoil, mulched and seeded to provide vegetative cover.

- an inspection and maintenance plan to ensure that the protective soil cover continues to be effective.

- administrative controls for the impacted portion of SWMU S-030 area to address potential exposure to contaminated soils and groundwater. This includes continued implementation of existing institutional controls (i.e., site access restrictions) and adding deed restrictions to limit the future use and development of the impacted area to commercial and industrial uses only. This will include a restriction preventing the future use of groundwater as a source of potable water. The potential for vapor intrusion to indoor air must be evaluated prior to any new construction or change in use of the impacted portion of SWMU S-030. Any disturbance of the protective soil cover placed in the S-030 area shall require prior Department approval. And,

- annual certification by the property owner that the institutional controls and engineering controls are in place and continue to be effective.

2.0 FACILITY BACKGROUND

Since the late 1800's Kodak Park has been Eastman Kodak Company's primary photographic manufacturing facility. Primary current or historic operations at Kodak Park include the manufacture of film and paper base; preparation and coating of photographic emulsions; manufacture of electrophotographic toner; cutting, packaging and distribution of finished products; and the production of synthetic organic chemicals, dyes, and couplers.

Kodak Park Section S (KPS) is located within the Town of Greece and the City of Rochester, Monroe County, New York. SIA-502/605 is located in the central portion of KPS. There are four major existing buildings located within, partially within, or relevant to the area. These buildings are described below and shown on Figure 2.

Building 502 (B-502) is located north of, and immediately adjacent to, SIA-502 and was constructed in 1967. The building is currently inactive but was previously used for material storage and distribution. Associated with B-502 was Shed S-26, located immediately southeast of B-502. Shed S-26 was an open-sided storage building constructed in 1974 that was historically used for drum and other chemical container (tote) storage of production chemicals. Shed S-26 was recently demolished as part of the Kodak Park Footprint Reduction Program.

The northeastern corner of Building 605 (B-605) occupies the western portion of SIA-502/605. Building 605 was constructed in 1968, with numerous additions from 1968 to 1982, and had been primarily occupied by the Kodak Distribution organization. The primary processes conducted at B-605 included warehousing and shipping.

Building 511 (B-511) is located northeast of, and immediately adjacent to, the eastern section of SWMU S-039 and was constructed in 1967. Building 511 houses equipment supplying refrigeration to buildings in KPS.

Building 642 (B-642) was constructed in 1969 with a number of additions constructed in 1973 through 1981. Building 642 operations included design and manufacturing of cameras, photographic film finishing, manufacturing of blood diagnostic equipment components and cardboard box manufacturing. The northwestern wing of Building 642 is located on the western portion of SWMU S-030 (the former location of an auto salvage yard).

A former fire training area (SWMU S-052) was located near B-642. Several related structures were formerly (now demolished) located within this area.

The primary land uses within SIA-502/605 included: warehousing and shipping, coal storage, light manufacturing, chemical storage, and industrial refrigeration. A network of underground water, natural gas, electric, and sewer lines underlie some areas of SIA-502/605, along with overhead piping infrastructure. The area is not served by Kodak's industrial sewer system; sanitary sewers in the area discharge to the Monroe County sanitary sewer network.

3.0 SOLID WASTE MANAGEMENT UNITS

In 1998, Kodak completed a RCRA Facility Assessment for Kodak Park. The assessment identified SWMUs subject to corrective action requirements. Prior to the RFI (Golder, 2004), Kodak, with the concurrence of the NYSDEC, had identified six SWMUs in the investigation area requiring Further Action (FA) and 15 SWMUs requiring a Sampling Visit (SV). The 21 FA and SV SWMUs have been categorized by unit type. These categories include container storage areas (4), release sites (3), tank traps (10), waste piles (2), a surface water impoundment (1), and a sump (1). The location of SIA-502/605 and the position of the SWMUs are shown on Figure 2. Two new SWMUs were subsequently identified during site investigations, S-090 (the B-502 petroleum tank site) and SWMU S-091 (the chlorinated solvent plume east of B-502). SWMU S-090 is addressed in the proposed remedy, but SWMU S-091, as previously indicated, is being managed as a separate project. Table 1 presents a summary of the SWMUs in SIA-502/605.

The RCRA Facility Investigation (RFI) and Corrective Measures Study (CMS) for SIA-502/605 were completed in 2004 and 2007, respectively. In the CMS report Kodak reviewed site conditions and made recommendations for long-term care of SIA-502/605.

4.0 FACILITY INVESTIGATION RESULTS

4.1 Historical Environmental Investigations

Several environmental studies have previously been conducted in or near the SIA-502/605 area. These studies are summarized in the following reports:

- Various spill reports;
- Kodak Park Building 605 Chemical Release Phase II Investigation Report (Kodak, 1993a);
- Phase I RCRA Facility Investigation Work Plan Investigation Area SIA-502 (Kodak, 1995);
- Phase I RCRA Facility Investigation Report, Investigation Area SIA-502 (Kodak, 1996a);
- Addendum to the Phase I RCRA Facility Investigation Report, Retention Pond Results (Kodak, 1996b);
- Closure Report B-605 Container Storage Lot HWMU-18 (Day Engineering P.C., 1998);
- Closure Report S-26 Container Storage Area HWMU-17 (Day Engineering P.C., 2000);
- SIA-502/605 RCRA Facility Investigation (RFI) Report (Golder, 2004b); and
- Work Plan for Test Excavation Activities at Eastman Kodak Company Building 508 New Parking Lot (Leader Professional Services, 2004).

During these previous subsurface investigation programs, a number of soil, surface water, and groundwater samples were collected from SIA-502/605 and adjacent areas for laboratory analysis, providing an existing soil and groundwater/surface water analytical database for the investigation area. In addition, the SIA 502/605 site geology and hydrogeology were characterized. This information was summarized in the RFI report, and is also presented below.

4.2 Site Bedrock Geology/Hydrostratigraphy

The uppermost bedrock unit beneath SIA-502/605 is the southward-dipping Rochester Shale, which conformably overlies the Irondequoit Limestone. The Rochester Shale is approximately 100 feet thick, with intermittent dolostone and limestone beds. Infrequent thin clay beds and severely weathered silt and clay partings were observed in the RFI soil and well borings. Fractures in this unit are generally parallel to the near-horizontal bedding and typically occur in frequent argillaceous bedding partings. The Rochester Shale as investigated in SIA-502/605 was described as weak and very friable, and was unable to withstand standard rock coring.

The conceptual hydrogeologic model for SIA-502/605 involves one unconfined aquifer crossing two stratigraphic units: the overburden and the Rochester Shale. Throughout most of the site (generally the central portion), the overburden is unsaturated, and the uppermost water-bearing unit is the top of the Rochester Shale. However, at the western, northern, and eastern periphery of the site, the overburden/bedrock contact drops in elevation and the lower portions of the overburden become saturated. A representative cross section is presented in Figure 3. Figure 4 shows the location of the cross section.

4.2.1 Site Overburden Geology

The overburden in KPS is typically thin compared to other areas of Kodak Park; though the maximum total thickness of overburden in SIA-502/605 is approximately 13.2 feet (located southeast of Shed S-26), over most of the site the average thickness is approximately 6.0 feet. Fill materials are found across the entire investigation area, and in many locations directly overlie bedrock. In a few areas, thin silty clay or clayey silt lacustrine deposits may be present.

Regrading and construction activities in KPS have reworked native soils and imported foreign soils. Reworked and imported soils, collectively referred to as fill, were encountered at all borehole locations. The fill typically consisted of silts, sands, and gravels mixed with crushed brick and stone and other miscellaneous components (e.g., cinders, glass, rock fragments, root fibers, and wood).

Lacustrine deposits overlie the bedrock in a few areas beneath KPS and are the least volumetric of the overburden deposits. The lacustrine deposits are variable in color, grain size, and density, but generally consisted of loose to compact, light brown to brown, silty clay/clayey silt with small proportions of silt and gravel.

4.3 Nature and Extent of Soil Contaminants

Pre-RFI and RFI soil samples from SIA-502/605 included a total of 89 soil samples from locations including borings, sediment, soil piles, and containers. These samples were typically collected from areas representative of, or in proximity to, the SWMUs within SIA-502/605. Note, however, that some of the samples were collected historically from soil piles or soils staged in load luggers to characterize the soils for subsequent management. Although these piles/load luggers were subsequently removed from the site, the data were evaluated during the corrective measures study. The soils data set was supplemented through the collection and laboratory analysis of a number of post-RFI samples from the SWMU S-030 and B-511 areas. Soil sample locations are shown on Figure B-4a. For the SWMU S-030 area, x-ray fluorescence field screening was also used to supplement laboratory analysis of samples for targeted metals. Soil sample locations in the S-030 area are shown on Figure B-4b.

Although not directly applicable to facilities undergoing RCRA Corrective Action, the NYSDEC compared results to the soil clean-up objectives (SCOs) in 6NYCRR Part 375. The screening against the Part 375 values was a multi-step process. The initial screen was a comparison to the unrestricted use criteria (per 375-6.8(a)). Values which exceeded the unrestricted use SCO from Part 375 were subsequently compared against various restricted use SCOs (per 375-6.8(b)).

4.3.1 Volatile Organic Compounds

Acetone was the only VOC that exceeded the 375-6.8(a) unrestricted use comparison value. There were 8 samples that slightly exceeded the 0.050 mg/kg comparison value, with results ranging from 0.051 mg/kg to 0.082 mg/kg. This soil comparison value is derived on the basis of protection of groundwater. Groundwater has not shown any impact from acetone. The next lowest comparison value is the 375-6.8(b) restricted use residential value for protection of public health (100 mg/kg). The soil results were far below this comparison value.

Summary of Volatile Organic Exceedances							
Use Class		Unrestricted 375-6.8(a)	Residential 375-6.8(b)	Restricted Residential 375-6.8(b)	Commercial 375-6.8(b)	Industrial 375-6.8(b)	Maximum Concentration mg/kg
	Associated SWMU						
Acetone	S-030	X[1]					0.082
SCO mg/kg		0.050	100	100	500	1,000	

Table Note: 1. Shading and "X" indicates that at least one sample in the data set exceeds the comparison value.

4.3.2 Semi-Volatile Organic Compounds

There were no SVOC exceedances of the 375-6.8(a) unrestricted use comparison values.

4.3.3 Pesticides/Polychlorinated Biphenyls (PCBs)

There were 7 samples that exceeded the 375-6.8(a) unrestricted use comparison value for PCBs (0.1 mg/kg). Of these, 4 samples exceeded the 1 mg/kg 375-6.8(b) restricted use residential value. With the exception of one sample, these concentrations were between 1 and 3 mg/kg. The exception was a historic sample collected from a soil pile near B-511with 64 mg/kg. The soil pile was subsequently removed from the site. Post RFI sampling of the B-511 area indicated no detections of PCBs. The B-511 sampling locations are shown on Figure B-4c. The remaining concentrations greater than 1 mg/kg were associated with SWMU S-030 (former Veterans Auto salvage area).

Summary of Pesticide/PCB Exceedances							
Use Class	Associated SWMU/ Area	Unrestricted 375-6.8(a)	Residential 375-6.8(b)	Restricted Residential 375-6.8(b)	Commercial 375-6.8(b)	Industrial 375-6.8(b)	Maximum Concentration mg/kg
PCBs	S-030	X[1]	X[1]	X[1]	X[1]		2.9
SCO mg/kg		0.1	1	1	1	25	
PCBs	B-511[2]	X[1]	X[1]	X[1]	X[1]	X[1]	64[2]
SCO mg/kg		0.1	1	1	1	25[2]	

Table Notes:

1. Shading and "X" indicates that at least one sample in the data set exceeds the comparison value.
2. The B-511 soil pile where 64 mg/kg was reported was subsequently removed from the site. Post RFI sampling of the B-511 area indicated no detections of PCBs.

4.3.4 Inorganic Constituents

A summary of inorganic constituent analytical results was included in Table A-1 of the CMS report. Screening of this data set is summarized in the table below. Shading indicates that at least one sample in the data set exceeded the corresponding Soil Cleanup Objective (SCO) comparison value.

Summary of Inorganic Exceedances							
Use Class	Associated SWMU	Unrestricted 375-6.8(a)	Residential 375-6.8(b)	Restricted Residential 375-6.8(b)	Commercial 375-6.8(b)	Industrial 375-6.8(b)	Maximum Concentration mg/kg
Arsenic	S-030	X[1]	X[1]	X[1]	X[1]	X[1]	20.3
SCO mg/kg		13	16	16	16	16	
Barium	S-030	X[1]	X[1]	X[1]	X[1]		1,700
SCO mg/kg		350	350	400	400	10,000	
Cadmium	S-030	X[1]	X[1]	X[1]	X[1]		47.5
SCO mg/kg		2.5	2.5	4.3	9.3	60	
Chromium	S-030	X[1]	X[1]	X[1]			220
SCO mg/kg (Trivalent)		30	36	180	400	800	
Copper	S-030	X[1]	X[1]	X[1]	X[1]		1,580[2]
SCO mg/kg		50	270	270	270	10,000	

Lead	S-030	X[1]	X[1]	X[1]	X[1]		3,640[2]
SCO mg/kg		63	400	400	1000	3900	
Mercury	S-030	X[1]					0.28[2]
SCO mg/kg		0.18	0.81	0.81	2.8	5.7	
Nickel	S-030	X[1]	X[1]	X[1]	X[1]		1,890[2]
SCO mg/kg		30	140	310	310	10,000	
Silver	S-030	X[1]	X[1]				45.1
SCO mg/kg		2	36	180	1,500	6,800	
Zinc	S-030	X[1]	X[1]	X[1]	X[1]	X[1]	39,200[2]
SCO mg/kg		109	2,200	10,000	10,000	10,000	

Table Notes:
1. Shading and "X" indicates that at least one sample in the data set exceeds the comparison value.
2. Soil where this value was found was subsequently excavated and removed from the site.

The inorganic exceedances are primarily associated with SWMU S-030, which is the former site of Veterans Auto, that was operated as a junkyard/automobile salvage yard. The elevated values occurred in a cinder layer that appears to have been the ground surface when the junkyard was active (the cinder layer often contains visible automotive debris). Soils in certain areas that were sampled and yielded exceedances listed above were subsequently excavated and removed from the site (as indicated on Figure B-4b).

- Arsenic - Two exceedances: 16.3* and 20.3 mg/kg
- Barium - Four exceedances: 378*; 1280*; 1600*; 1700 mg/kg
- Cadmium - Four exceedances: 3.8*, 22.1*, 24.6*, 47.5 mg/kg
- Chromium - Four exceedances: 43.7*, 51.5*, 61.6, 220 mg/kg
- Copper - Four exceedances: 153*; 384*; 1030; 1580*; mg/kg
- Lead - Seven exceedances: 100; 125; 272; 400*; 1300*;1360; 3640* mg/kg
- Mercury - Three exceedances: 0.19*, 0.19, 0.28* mg/kg
- Nickel - Four exceedances: 41.3*; 83.9*; 119; 1890* mg/kg
- Silver - Sixteen exceedances: 2.55, 2.82, 2.97, 3, 3.9*, 4.25, 4.4*, 4.71, 5.81, 6.1*, 6.5*, 6.77, 7.01, 7.2*, 11.6, 45.1 mg/kg
- Zinc - Thirteen exceedances: 111*; 189; 271; 331; 415*; 535; 701; 1400; 1960*; 7170*; 17100; 20700; 39200*; mg/kg

Note: * = Soil where this value was found was subsequently excavated and removed from the site.

X-ray fluorescence field screening was used to further delineate metals contamination of soils in the S-030 area. Based on the available laboratory sample results, and the capability of the X-ray instrumentation, the field effort used copper, zinc and lead as indicator compounds. The field screening and prior laboratory analytical results identified impacted soils as shown on Figure B-

4b.

4.3.5 Non-Aqueous Phase Liquid (NAPL) Evaluation Results for Soils

There were no reported field observations of the presence of NAPL during the RFI or post-RFI field sampling activities. However, the data suggest that there is the potential that NAPL is or was present within the saturated or unsaturated soils within a very limited area of the SIA-502/605 investigation area. Four constituents from the SWMU S-030 Phase I excavation area had estimated theoretical pore water concentrations exceeding 1% of their respective aqueous solubility limits based on post-RFI work (Appendix A, Table A-3 of the CMS Report). Two of these constituents are phthalate, one a PAH, and one a PCB (Aroclor 1248). However only one constituent, the PAH pyrene, had theoretical pore water concentrations exceeding its aqueous solubility limit.

4.3.6 Screening Level Risk Assessment for Soils

Kodak conducted a screening level risk assessment (SLRA) for SIA-502/605 as a component of the CMS report. Note that the soil data set that was evaluated included samples collected from borings, load luggers (or other containers) and piles. These soil samples were recovered from depths of down to 12 feet below ground surface (bgs). However, for the purpose of the SLRA, all soil samples were conservatively assumed to be from the upper 2 feet of the subsurface (i.e. considered to be "surface soils" for the direct soil contact pathway assessment).

In the SLRA, Kodak evaluated potential direct contact exposure risk associated with the soils. The residential exposure scenarios were based on published USEPA exposure factors for ingestion of soils under a residential setting (i.e., default ingestion rates, body weights, exposure durations, etc.) as outlined in USEPA's Soil Screening Guidance (USEPA, 1996).

Under a residential use scenario, the SLRA identified exceedances for benzo(a)pyrene, PCBs (Aroclor 1248 and 1260), arsenic , beryllium, lead, nickel, and zinc. In the SLRA, these constituents were then subjected to additional screening to evaluate potential direct contact exposure risk under an industrial/commercial (I/C) exposure scenario. The identified I/C screening identified PCBs (Aroclor 1260), arsenic and lead as constituents of potential concern. The area where these exceedances occurred (S-030 area) is shown on Figure 5. I/C risk-based screening levels were considered appropriate for SIA-502/605 soils since the current and projected future use of the property is as an active industrial facility.

SLRA Results

The SLRA identified the direct contact and dust inhalation pathway for on-site workers as a means of possible receptor exposure for the constituents of potential concern (PCBs, arsenic and lead) for the SWMU S-030 area. Existing institutional control measures include fencing and security to control access to the site, so the potential for actual exposures is quite low. In addition, a Department approved excavation master plan is in place. The master plan specifies administrative and field procedures to control potential exposures to contaminated soils during excavation activities.

Based on the results of the SLRA, the corrective action objective for soils in SIA-502/605 is to contain, isolate or treat the soil contaminants to ensure that they do not pose an unacceptable risk to human health and the environment. Potential impacts of soil contaminants on groundwater quality are addressed as part of the groundwater corrective measures evaluations described in Section 4.4.

4.4 Groundwater

4.4.1 Overburden/TOR Hydrogeology

Groundwater elevation measurements were obtained for wells in and adjacent to the SIA-502/605 area in April 2007. A groundwater potentiometric contour map (Figure 4) was generated using the data generated from these measurements. Because water elevation data suggests the uppermost water bearing unit is unconfined and crosses stratigraphic units, water elevation data from all well types present in KPS (i.e., overburden, interface, and TOR) were plotted together. This grouping of well types in KPS has routinely been employed for the Kodak Park-wide semi-annual groundwater equipotential maps. In general, the horizontal component of the unconfined groundwater flow in SIA-502/605 is to the north, with some radially divergent flow to the northwest and northeast in the northern portion of the area. Note there are no GQ wells present in the KPS area of Kodak Park, thus no GQ flow zone map was generated.

To determine the degree of vertical groundwater flow at the site, as part of the RFI report, groundwater elevations were plotted on three cross sections across SIA-502/605. Because no overburden/TOR well pairs existed within the study area at the time of the RFI, vertical gradients were not measured directly. However, based on regional groundwater flow patterns, the vertical component of groundwater flow can be inferred as downward. Subsequent investigation in a nearby area (northeast of Shed S-26 in KPS) included several paired wells, and these also indicate a downward vertical gradient.

The geometric mean hydraulic conductivity of the overburden flow zone in SIA-502/605 is calculated to be 2.44×10^{-4} cm/sec, 4.90×10^{-4} cm/sec for the TOR flow zone and 1.78×10^{-3} for the interface zone. Horizontal groundwater flow appears to occur primarily within the interface zone. The overburden, interface zone, and bedrock are all derived from shale. In the overburden, the shale is weathered to clay and is less conductive than the underlying interface zone that has open fractures. The bedrock below the interface zone has few open fractures and becomes less conductive.

4.4.2 Nature and Extent of Groundwater Contaminants

Groundwater analytical results for VOCs, SVOCs, and inorganic constituents were compared to NYSDEC TOGS 1.1.1 values to evaluate the nature and extent of groundwater contamination in the investigation area.

Screening of the RFI and pre-CMS data sets identified VOCs in excess of TOGS values (methylene chloride and formaldehyde) at only two locations, with an exceedance for only one compound at each location. For methylene chloride the maximum concentration detected was 0.0051 mg/l, just slightly higher than the 0.005 mg/l comparison value. For formaldehyde, the value was at 0.027 mg/l. No SVOCs exceedances were detected. Groundwater quality results are summarized on Figure 5.

A screening of historic groundwater records showed slight exceedances for four additional VOCs (1,1-dichloroethane, benzene, carbon disulfide and ethylbenzene), with concentrations ranging from 0.0081 to 0.015 mg/l. An historic screening of the SVOC data set indicated one exceedance for bis(2-ethylhexyl)phthalate at 0.006 mg/l and one for phenol at 0.047 mg/l.

Twelve inorganic constituents were detected above comparison values in the most recent samples collected from Investigation Area monitoring wells. Seven inorganic constituents (sodium, iron, magnesium, manganese, chromium, lead and thallium) were most frequently detected above comparison values in most wells sampled. Because of their widespread distribution, and the fact that many of these constituents are commonly detected in Kodak Park at similar concentrations, these constituents are not thought to be associated with SWMU-related activities. In addition, with the exception of lead in SWMU S-030, there is no known association of these metals with SWMUs in the investigation area.

In conclusion, the groundwater results for SIA-502/605 showed a few values slightly in excess of comparison values, but did not indicate the presence of any significant source areas or contaminant plumes. In addition, the area is supplied by municipal water, and groundwater is not being used for potable or non-potable supply, so the potential for adverse exposures associated with site groundwater was determined to be insignificant.

5.0 IDENTIFICATION AND SCREENING OF REMEDIAL TECHNOLOGIES

Remedial technologies appropriate for soil and groundwater remediation at Kodak Park have been summarized and evaluated the RCRA Facility Investigation Pre-Investigation Evaluation of Corrective Measures Technologies (PIE-CMT) Report (Eastman Kodak Company, 1994), as well as a number of other corrective measures studies/feasibility studies conducted for other areas of Kodak Park. Pre-screened technologies from the PIE-CMT considered for SIA-502/605 in the corrective measures study are discussed briefly below.

5.1 Potential Soil Remedial Technologies

5.1.1 Excavation and Disposal

Soil excavation and disposal physically removes contaminated material from a site. This technology has been proven effective at reducing contaminant concentrations within the Investigation Area as demonstrated during the pre-CMS supplemental field investigation, particularly for the SWMU S-030 area. Soil excavation/disposal was retained for further consideration.

5.1.2 Treatment Technologies

Technologies retained from the PIE-CMT for the treatment of Site soil included biological treatment, soil piles, vapor extraction and chemical enhanced recovery/soil flushing. The applicability of these technologies for SIA-502/605 soil is discussed below.

- Soil Treatment - Technologies retained from the PIE-CMT for the treatment of Site soil included biological treatment, soil piles, vapor extraction and chemical enhanced recovery/soil flushing. These technologies are not expected to be very effective for inorganics, the primary constituents of concern in the S-030 area. Although these technologies were evaluated in the CMS, they were subsequently eliminated from consideration.

- Soil Vapor Extraction - Given that exceedances are primarily metals (lead and arsenic) and soil vapor extraction is primarily for volatile organic constituents, this technology was eliminated from consideration.

- Chemical Enhanced Recovery/Soil Flushing - This is an in situ technology that uses extraction chemicals or solvents to remove inorganic and some organic compounds from soils and groundwater. The fluids are passed through contaminated soils by gravity or injection techniques and re-circulated. The key concerns with using this technology is the volume of the recovered solution and aboveground treatment systems and cost needed to recycle the extraction solvent and disposal of the extracted materials. Given the defined layer of impacted media (i.e., the layer of slag, cinders and glass, approximately one and one half foot in thickness, found in the SWMU S-030 area, the implementation of this technology may "smear" the impacted media as much as remove the contamination. Additionally, full scale implementation of this technology has been limited. This alternative was not considered further.

5.1.3 Containment Technologies

The technology considered for physical containment is protective covering. This technology involves the installation of a physical barrier over the surface of the contaminated area. Protective cover limits direct contact with contaminated surface soil; and reduces, in the case of low permeability cover, the infiltration of rainfall, snowmelt, or uncollected runoff into contaminated soils, in sum reducing the potential for leaching of contaminants into groundwater. Protective cover technologies which are considered suitable for Kodak Park use include low-permeability soil, asphalt, Portland cement concrete, or low-permeability soil in conjunction with geosynthetics (generally termed a composite liner). Additionally, where leaching of soil contaminants is not a principal concern, alternate protective cover technologies which serve to limit direct contact and dust generation have been considered suitable for use at Kodak Park.

- Low Permeability Soil Cover - A low-permeability soil cover typically consists of a compacted clay layer overlain by a soil layer, which is used as a barrier to reduce the potential for intrusion through the cover by people or burrowing animals. A vegetated soil layer, which is used to reduce erosion and provide evapotranspiration of soil moisture, is typically placed over the low-permeable layer. A well-maintained low-permeability soil cover can be an effective technology for preventing exposure to contaminated soil and for reducing infiltration through contaminated soils.

- Geosynthetic Cap and Cover System - A geosynthetic cap and cover typically consists of an impermeable High Density Polyethylene (HDPE) geomembrane underlain by a geotextile fabric to provide protection to the geomembrane from underlying soils. Above the geomembrane, a geocomposite drainage system is used to provide proper drainage of the cap system. The geocomposite drainage system is then overlain with an appropriate thickness (e.g., 24-inches) of compacted cover soil, followed by 6-inches of top soil. The topsoil, which is used to reduce erosion and provide evapotranspiration of soil moisture, is typically placed over the low-permeable layer. A well-maintained geosynthetic cap and cover system can be an effective technology for preventing exposure to contaminated soil and for reducing infiltration through contaminated soils.

- Asphalt and Portland Cement Concrete Covers - An asphalt or Portland cement concrete cover installed over contaminated soil can reduce infiltration and provide an effective barrier against human contact with the contaminated soil. In some applications the paved area can be used productively for parking or storage. The cover is typically designed according to its anticipated use. In the case of an asphalt cover used for vehicular traffic, for instance, the cover could consist of a prepared gravel subgrade layer, a base course and surface course of asphalt, and a surface treatment to render the asphalt relatively watertight. A single layer of asphalt with surface treatment could be used for areas that exclude vehicular traffic. Both asphalt and Portland cement concrete covers are subject to cracking and weathering, and require regular maintenance to ensure integrity.

- Alternate Protective Covers - Alternate protective covers suitable for Kodak Park generally consist of installation of a uniform and homogenous layer of durable and erosion resistant material over the soils of concern. The purpose of the specific covering is not to restrict infiltration, but to limit the potential for direct contact with impacted soils and to mitigate the potential for dust generation. Materials appropriate for this application may include adequate thickness of topsoil (including vegetation), granular soils, crushed stone, or crushed/screened and environmentally innocuous aggregate from building demolition. These materials may be underlain by a geotextile to provide a clear visual defining layer between clean and contaminated soils. The specific cover material type would be selected based on area-specific conditions including the nature of Kodak Park operations within the area. As with any of the protective cover technologies, the installed cover would require scheduled integrity inspections and maintenance, as warranted.

Given the defined area of impacted soils, and the readily implementable nature of the remedy, containment of soils was retained for further evaluation.

5.1.4 Institutional Controls for Soils

SIA-502/605 is an active portion of an industrial complex. Institutional controls that are currently enforced by Kodak include fencing, land-use restrictions, controlling subsurface excavations and project specific health and safety plans such that proper protective equipment is worn and proper monitoring is conducted during excavation and restricting unauthorized personnel from entering SIA 502/605. Institutional controls were retained for further evaluation.

5.1.5 Soil Technology Screening Summary

Based on the technology screening evaluations summarized above, and the results of the SLRA, the technologies retained for further evaluation as potential components of the corrective measures alternative for soils are:

- Soil excavation and disposal;
- Containment of soils; and
- Institutional controls.

5.2 Potential Groundwater Remedial Technologies

As discussed above, two organic constituents (methylene chloride and formaldehyde) were identified as exceeding groundwater comparison values, one each in the most recent groundwater sample collected from two separate wells (IB502N and RB605NE) within the investigation area. The levels of these two organic constituents were low, with methylene chloride essentially at the comparison value of 0.005 mg/L. Since plausible pathway(s) are not believed to exist, the proposed remedy is institutional controls to insure that on-site exposures to impacted groundwater do not occur. Consequently, an evaluation of remedial technologies for groundwater is not warranted at this time.

5.3 Assembly of Remedial Alternatives

Two alternatives have been developed for detailed evaluation to meet the soil and groundwater corrective action objectives for SIA-502/605. These alternatives are:

- Alternative 1 - Excavation and Disposal of Impacted Soils and Institutional Controls for Impacted Portion of SWMU S-030

This alternative would include excavation and disposal of soils from the SWMU S-030 area where a layer of slag, cinders and glass, approximately one and one half foot in thickness, has been delineated (Figure 5), where soil contaminant concentrations have been identified as exceeding comparison values (impacted area). This alternative also includes institutional controls for the impacted S-030 area.

- Alternative 2 - Protective Soil Covering of Impacted Soils and Institutional Controls for Impacted Portion of SWMU S-030

This alternative would include providing protective soil cover underlain by geotextile to provide separation between impacted and clean soil in SWMU S-030, as described in the Alternate Protective Covers section above. This alternative also includes institutional controls for the impacted S-030 area.

6.0 EVALUATION OF CORRECTIVE MEASURES ALTERNATIVES

This section presents the evaluation of corrective measures alternatives. A description of the corrective measures evaluation criteria is presented, followed by a discussion of the potential corrective measures alternatives, and finally the proposed corrective measures alternative.

6.1 Corrective Measures Evaluation Criteria

The criteria used to evaluate each corrective measure alternative included:

- Technical - Evaluation of each corrective measure alternative based on performance, reliability, implementability, and safety.

- Environmental - Facility conditions and pathways of contamination actually addressed by each alternative and evaluation of the short and long-term beneficial and adverse effects of the response alternative.

- Human Health - The extent to which each alternative mitigates short and long-term potential exposure to any residual contamination and protects human health both during and after implementation of the corrective measure.

- Institutional - Assessment of relevant institutional needs for each alternative regarding Federal, State, and local requirements and permitting on the design, operation, and timing of each alternative.

- Reduction of Toxicity, Mobility, or Volume - Evaluate the degree to which each of the alternatives will reduce the toxicity, mobility, or volume of the contaminants and/or impacted media.

- Cost - This criterion identifies estimated costs associated with each alternative. This evaluation presents the estimated total costs including direct and indirect capital, operational and maintenance costs. These estimated costs were obtained from data including estimates for historic/current Kodak Park remedial activities, costing manuals (e.g., R.S. Means), preliminary estimates from contractors/vendors, and similar project experience.

  The cost estimates also include engineering fees and contingencies for potential unexpected cost increases during final design and implementation of the alternatives. The cost contingency was based on the anticipated variability and/or uncertainty associated with each cost element from prior actions at Kodak Park. The present worth cost, as estimated by Kodak in 2007 dollars is shown for each alternative.

6.2 Evaluation of Alternative 1 - Excavation and Disposal of Impacted Soils and Institutional Controls for Impacted Portion of SWMU S-030

The Excavation and Disposal of Impacted Soils from SWMU S-030 and Institutional Controls alternative includes the following activities:

- Excavation and off-site disposal of impacted soils contaminated with metals, PCBs and PAH within the SWMU S-030 salvage yard area (see Figure 5 for proposed excavation area) ;
- Implementation of institutional controls and land-use restrictions for the impacted area of SWMU S-030. This will include access controls, use restricted to commercial/industrial, and a restriction preventing the future use of groundwater as a source of potable water. The potential for vapor intrusion to indoor air must be evaluated prior to any new construction or change in use of the impacted area of SWMU S-030 that involves an occuppied structure. And,
- Continued implementation of excavation and health and safety protocols for any future excavations within the impacted SWMU S-030 area that may be necessary (e.g., to conduct routine maintenance activities).

Technical Analysis - Under this alternative, excavating exposed soils with elevated contaminant (metals) concentrations would be performed in the SWMU S-030 area. The excavation is proposed to be conducted in a series of sections, using XRF technology to screen for arsenic, zinc, and lead while in the field. This remedy involves a modest soil excavation project in the SWMU S-030 salvage yard area, and it is technically feasible. There are potential short-term risks from worker exposure and fugitive dust with respect to such an undertaking, which will need to be addressed by appropriate health and safety and dust control measures.

Environmental Analysis - Alternative 1 is protective of the environment as the direct contact soil exposure of the SWMU S-030 soils pathway and soil inhalation for workers were generally recognized as the primary exposure routes for impacted soil. Excavation and disposal will physically remove the exposure pathway providing risk reduction and environmental benefit. Proposed future conditions associated with implementation of Alternative 1 are protective of the environment.

Human Health Analysis - The removal of soils with elevated contaminant levels and the implementation of institutional controls to manage exposures to soils would be protective of human health.

Institutional Analysis - The excavation will need to be conducted in accordance with the Kodak Excavation Management Plan II (EMP II - Kodak 1996c), or the then current equivalent. Furthermore, a utilities survey would be required to insure that obstructions are not encountered or are appropriately addressed during the excavation program. The property owner maintains a current Site property survey. Land use restrictions prohibiting groundwater use and limiting the use of the impacted SWMU S-030 area to industrial/commercial purposes in SIA-502/605 will be implemented. Compliance with a Site-specific health and safety plan under 29CFR 1910.120, RCRA and Occupational Health and Safety Act (OSHA) regulations are required during implementation of this alternative. A NYSDEC-approved Corrective Measures Implementation (CMI) Plan or other approved mechanisms will need to be developed for this or any other alternative prior to initiating remedial construction activities associated with this alternative.

Reduction of Toxicity, Mobility, or Volume - This alternative provides for removal and disposal of the impacted soils, which provide for a direct reduction of toxicity, mobility, and volume.

Cost Analysis - The costs associated with this alternative include soils which will be removed and backfilled as described above. An assumption is made that XRF technology will be used on-site to facilitate the identification and screening of the slag layer of the SWMU S-030 area. For purposes of costing, it was assumed that a soil layer of 2.5-feet in thickness would be removed, resulting in a total of approximately 5,300 tons removed and shipped off-site for disposal. The costs for implementation of this alternative are detailed in Table D-1. Kodak's estimated 30-year present value cost (including capital and O&M costs) for Alternative 1 is approximately $544,871.

6.3 Evaluation of Alternative 2 - Protective Soil Covering of Impacted Soils and Institutional Controls for Impacted Portion of SWMU S-030

This alternative includes the following elements:

- Covering the impacted area of SWMU S-030 area soils with geotextile, followed by approximately 20-inches of compacted fill (uncontaminated soil and/or crushed demolition debris) and six inches of topsoil, mulched and seeded (see Figure 5 for proposed cover area);
- Implementation of institutional controls (i.e., site access restrictions) and adding deed restrictions to limit the future use and development of the impacted area of SWMU S-030 to commercial and industrial uses only. This will include a restriction preventing the future use of groundwater as a source of potable water. The potential for vapor intrusion to indoor air must be evaluated prior to any new construction or change in use of the impacted area of SWMU S-030. Administrative controls also include an operation and maintenance plan specifying routine monitoring, maintenance, and reporting on the condition of the existing and proposed soil cover; and,
- Continued implementation of excavation and health and safety protocols for any future excavations activities within the impacted area of SWMU S-030 that may be necessary to conduct routine maintenance activities.

Technical Analysis - The protective soil covering underlain with geotextile remedy was previously utilized in the B-143 area of KPW, and XIA-202/208 (KPX area) as final remedies. The proposed protective soil covering would be constructed by first placing a geotextile material directly above the existing soil surface. The geotextile would primarily serve a visual marker to delineate between the existing surface and the cover soil. Approximately 20-inches of uncontaminated fill (soil and/or crushed demolition debris) would be placed above the geotextile, and would be overlain with six inches of mulched and seeded topsoil.

Environmental Analysis - The environmental benefits of Alternative 2 are expected to be similar to that of Alternative 1, as direct exposure to impacted materials would be reduced via protective soil covering and managed by institutional controls. Proposed future conditions associated with implementation of Alternative 2 are protective of the environment.

Human Health Analysis - The human health analysis is considered to be similar to that as in Alternative 1. Because the exposure pathway for the SWMU S-030 area is considered eliminated (for unacceptable exposures) by Alternative 1 and blocked by protective cover in Alternative 2, both alternatives are considered protective of human health.

Institutional Analysis - Regrading or earthwork related to the cover construction is to be conducted in accordance with the Kodak Excavation Management Plan II (EMP II), or the then current equivalent. Furthermore, a utilities survey may be required to insure that obstructions are not encountered or are appropriately addressed during soils placement (i.e., grading) activities. The property owner maintains a current Site property survey. Land use restrictions prohibiting groundwater use and limiting use of the impacted area of SWMU S-030 to industrial/commercial purposes will be implemented. Compliance with a Site-specific health and safety plan under 29CFR 1910.120, RCRA and Occupational Health and Safety Act (OSHA) regulations are required during implementation of this alternative. A NYSDEC-approved Corrective Measures Implementation (CMI) Plan or other approved mechanisms will need to be developed for this or any other alternative prior to initiating remedial construction activities.

Reduction of Toxicity, Mobility, or Volume - This alternative provides a physical barrier to impacted soils. Realized toxicity would be less (since exposures would be reduced) than current conditions. Mobility (mostly due to wind/dust) would also decrease with a protective barrier in place. The volume of impacted soils would remain the same.

Cost Analysis - The costs associated with this alternative include covering the impacted area of SWMU S-030 with geotextile, followed by approximately 20-inches of compacted fill (uncontaminated soil and/or crushed demolition debris) and topped with six inches of topsoil, mulched and seeded. The costs for implementation of this alternative are detailed in Table D-2. Kodak's estimated 30-year present value cost (including capital and O&M costs) for Alternative 2 is approximately $149,159.

7.0 PROPOSED FINAL CORRECTIVE MEASURES

The Department has determined that Alternatives #1 and #2, as described in sections 6.2 and 6.3, are both protective of human health and the environment. The two alternatives are functionally equivalent, and either alternative may be implemented.

Alternative #1 involves removal of contaminated soil in the impacted area of SWMU S-030. This alternative is more costly initially (by approximately $300,000 in immediate direct capital costs), but it does not impair future use of a portion of the site, so implementation of this alternative would enhance the future value of the property. Alternative #2 is less costly in the near term but it does impair reuse of a portion of the site due to the presence of protective soil cover for the impacted area of SWMU S-030. This impairment reduces the future value of the property, and although it is not directly accounted for in the cost estimate, this could be viewed as an additional cost associated with this alternative.

Both alternatives prevent human exposure to contaminated soils in the impacted area of SWMU S-030 either through removal (Alternative #1) or through placemment of protective soil cover (Alternative #2). Institutional controls/land-use restrictions (e.g., continued use as an industrial facility, exclusion of unauthorized personnel, implementation of appropriate excavation/health and safety plans) will be implemented for the impacted area under Alternative #2, to address potential contact with contaminated soils that would be left in place. As described in section 6.2, institutional controls would also be required under Alternative #1, but would be less restrictive since contaminated soils in the impacted area of SWMU S-030 would be removed. Although impacts to groundwater are limited, as described in both Alternative 1 and 2, institutional controls would be employed to insure that on-site exposures to impacted groundwater do not occur.

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SOLID WASTE MANAGEMENT UNIT DESCRIPTION SUMMARY
SIA-502/605 CMS
KODAK PARK, ROCHESTER, NEW YORK

Unit ID	Building	Unit Type	Unit Description	Pre-CMS Status	Post-CMS Status
S-001	B-502	CS	HWMU-17 Drum Storage	□	□
S-002	B-502	CS	SWMU-11 West Lot Drum Storage	□	□
S-003	B-502	CS	SWMU-11 East Lot Drum Storage	■	□
S-005	B-502	TT	Tank Trap ID TT7500ST	■	□
S-018	B-605	CS	HWMU-18 Container Storage	□	□
S-022	B-605	TT	Tank Trap ID TT7300IS	□	□
S-023	B-605	TT	Catch Tank ID TT7600ST	■	□
S-026	B-642	TT	Tank Trap ID TT7000SA	□	□
S-027	B-642	TT	Tank Trap ID TT7200SA	□	□
S-028	B-642	TT	Tank Trap ID TT7400SA	□	□
S-029	B-642	TT	Tank Trap ID TT7500SA	□	□
S-030	B-642	WP	Former Auto Salvage Yard	■	■
S-039	B-511	RS	Release Site	■	□
S-043	B-502	TT	Tank Trap ID TT7200ST	□	□
S-044	B-502	TT	Tank Trap ID TT7300ST	□	□
S-045	B-502	TT	Tank Trap	□	□
S-046	B-502	SI	Surface Impoundment	■	□
S-052	B-606	RS	KPS Fire Training Facility	□	□
S-053	B-642	S	Sump	□	□
S-057	B-502	WP	Soil Pile (Industrial Waste)	□	□
S-070	B-511	RS	Release Site	■	□
S-090*	B-502	RS	Release Site	■	□
S-091*	B-502	RS	Release Site	■	■

Key:

■ = Further Action
□ = No Further Action
♦ = Sampling Visit
CS: = Container Storage Area
SI: = Surface Impoundment
WP: = Waste Pile
RS: = Release Site
S: = Sump
TT = Trap Tank
* = SWMU assigned post-RFI

Note that SWMU S-091 is being addressed separately (not as part of SIA-502/605).

TABLE D-1
SIA-502/605
KODAK PARK, ROCHESTER, NEW YORK

CAPITAL AND OPERATIONS & MAINTENANCE COST ESTIMATE

ALTERNATIVE NO. 1 - Excavation and Disposal of Impacted Soils in SWMU-030 and Institutional Controls

Direct Capital Cost ($)

Item	Unit Cost	Unit	Quantity	Years Incurred	Total Cost	Present Value Cost @ 5%
Excavation, Disposal, and Backfill of SWMU S-030 Area (1)						
Soil Excavation and Loading	$ 1.65	Ton	8800	1	$ 14,520	$ 14,520
Soil Trucking and Disposal	$ 43.24	Ton	5300	1	$ 229,167	$ 229,167
Soil Backfill and Compaction	$ 12.97	Ton	8800	1	$ 114,114	$ 114,114
X-Ray Fluorescence Testing of Soils (Delineation)	$ 1,260	Day	3	1	$ 3,780	$ 3,780
		Subtotal, Direct Capital Costs			$ 361,581	$ 361,581

Indirect Capital Costs ($)

Item		Total Cost	Present Value Cost @ 5%
Mobilization/Demobilization	10% of Capital Costs	$ 36,158	$ 36,158
Engineering/Administration	15% of Capital Costs	$ 54,237	$ 54,237
Legal/Deed Restrictions	Lump Sum	$ 2,500	$ 2,500
Startup	10% of Capital Costs	$ 36,158	$ 36,158
Contingencies	15% of Capital Costs	$ 54,237	$ 54,237
	Subtotal, Indirect Capital Costs	$ 183,290	$ 183,290
	Total Capital Costs (Direct and Indirect)	$ 544,871	$ 544,871

Total Costs ($)

	Total 30 Year Cost	30 Yr. Present Value Cost @ 5%
Total Cost of Alternative	$ 544,871	$ 544,871

Notes/Assumptions:
A 5% rate of return was used for calculating present value costs.
(1) Actual costs based on those incurred during Pre-CMS Supplemental Investigation adjusted for inflation
(2) Costs include field technician for sampling @ $50 per sample and analysis at $125 for VOCs

TABLE D-2
SIA-502/605
KODAK PARK, ROCHESTER, NEW YORK

CAPITAL AND OPERATIONS & MAINTENANCE COST ESTIMATE

ALTERNATIVE NO. 2 - Protective Soil Covering with Geotextile of Impacted Soils in SWMU-030 and Institutional Controls

Direct Capital Cost ($)

Item	Unit Cost	Unit	Quantity	Years Incurred	Total Cost	Present Value Cost @ 5%
Geotextile & Soil Covering of SWMU S-030 Area						
Site Preparation (Dozer and smooth drum compactor)	$ 3,150	Day	2	1	$ 6,300	$ 6,300
Geotextile (10 ounce/square yard)	$ 2	SY	5200	1	$ 9,880	$ 9,880
12-inches Cover Soil with Compaction	$ 18	CY	1750	1	$ 31,500	$ 31,500
6-inches Topsoil	$ 22	CY	875	1	$ 19,250	$ 19,250
Seed and Mulch	$ 1,500	Acre	1.5	1	$ 2,250	$ 2,250
			Subtotal, Direct Capital Costs		$ 69,180	$ 69,180

Indirect Capital Costs ($)

		Total Cost	Present Value Cost @ 5%
Mobilization/Demobilization	10% of Capital Costs	$ 6,918	$ 6,918
Engineering/Administration	15% of Capital Costs	$ 10,377	$ 10,377
Legal/Deed Restrictions	Lump Sum	$ 2,500	$ 2,500
Startup	10% of Capital Costs	$ 6,918	$ 6,918
Contingencies	15% of Capital Costs	$ 10,377	$ 10,377
	Subtotal, Indirect Capital Costs	$ 37,090	$ 37,090
	Total Capital Costs (Direct and Indirect)	$ 106,270	$ 106,270

Annual Operations and Maintenance Costs ($), Direct

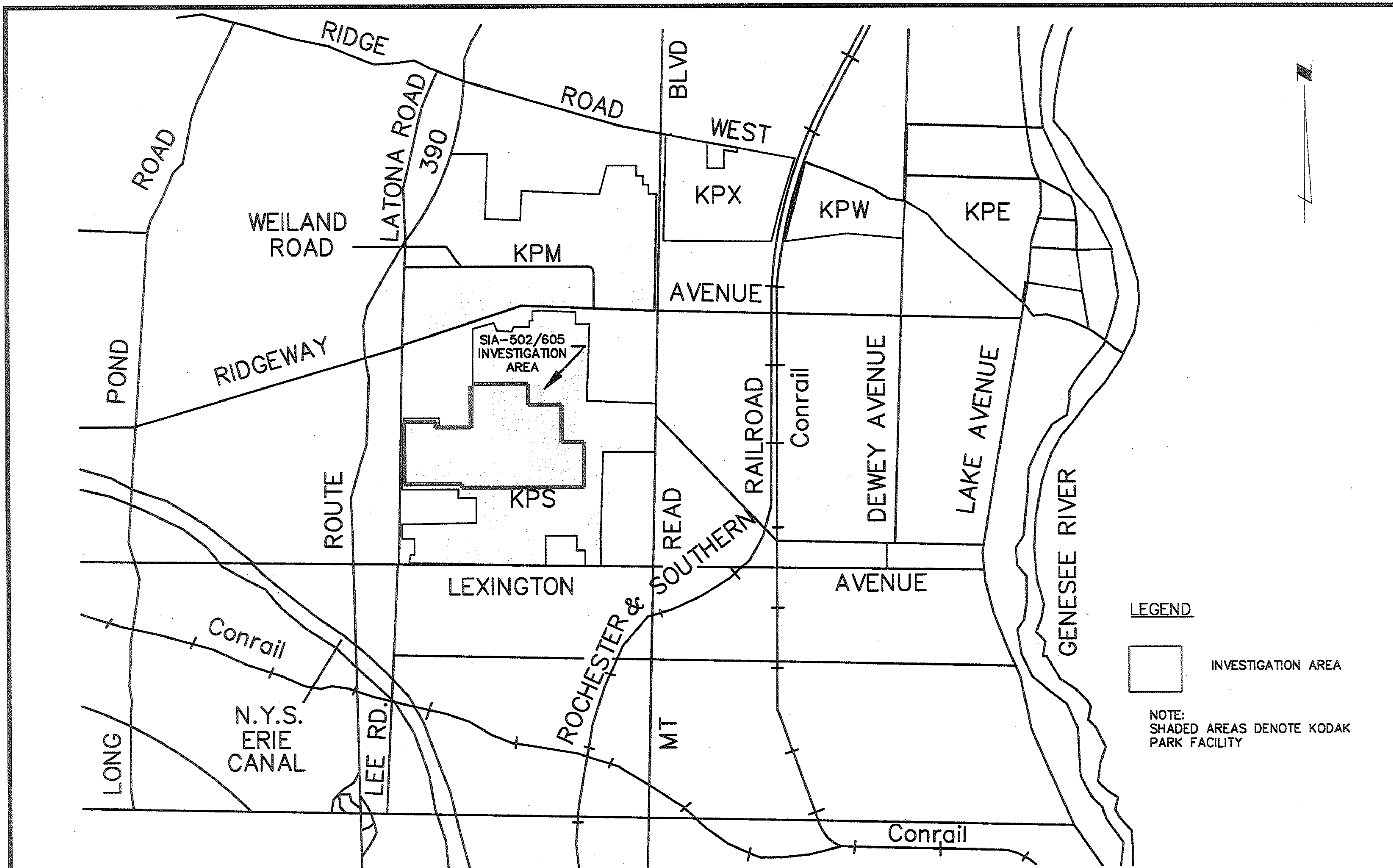
Item	Unit Cost	Unit	Quantity	Years Incurred	Annual Cost	30 Yr. Present Value Cost @ 5%
Lawn Maintenance	$ 2,000	Year	1	30	$ 2,000	$ 32,282
			Total Annual Cost		$ 2,000	
			Subtotal, Direct O&M Costs (30 Years)		$ 60,000	$ 32,282

Annual Operation & Maintenance Cost, Indirect ($)		Annual Cost	30 Yr. Present Value Cost @ 5%
Engineering/Administration	15% of O&M Costs	$ 300	$ 4,546
Legal	5% of O&M Costs	$ 100	$ 1,515
Contingencies	15% of O&M Costs	$ 300	$ 4,546
	Subtotal, Indirect O&M Costs	$ 700	$ 10,607
	Total Annual O&M Cost (Direct and Indirect) (9)	$ 2,700	
	Total O&M Costs (Direct and Indirect)	$ 81,000	$ 42,889

Total Costs ($)

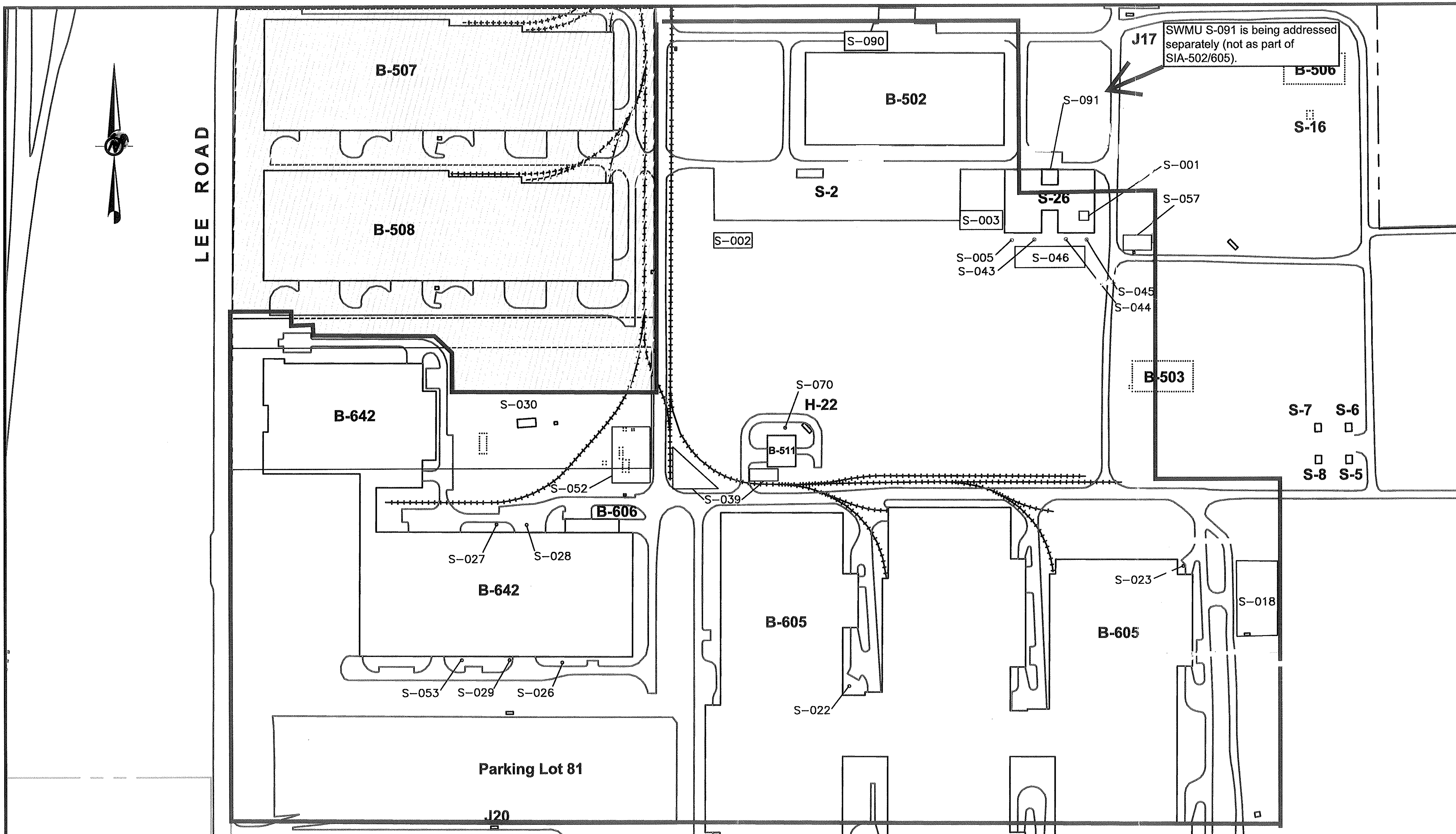
	Total 30 Year Cost	30 Yr. Present Value Cost @ 5%
Total Cost of Alternative	$ 187,270	$ 149,159

Notes/Assumptions:
A 5% rate of return was used for calculating present value costs.
(1) Costs include field technician for sampling @ $50 per sample and analysis at $125 for VOCs



CLIENT/PROJECT				TITLE
Kodak SIA-502/605 CORRECTIVE MEASURES STUDY KODAK PARK CORRECTIVE ACTION PROGRAM EASTMAN KODAK COMPANY ROCHESTER, NEW YORK		Golder Associates Buffalo, New York		SITE LOCATION MAP

DRAWN	CHECKED	REVIEWED	DATE	SCALE	FILE NO.	JOB NO.	DWG NO.	FIGURE
DCW			10/2/07	NA	053-9465	053-9465	0539465A574	1



S-027 S-030 SWMU

INVESTIGATION AREA

PROPERTY LINE

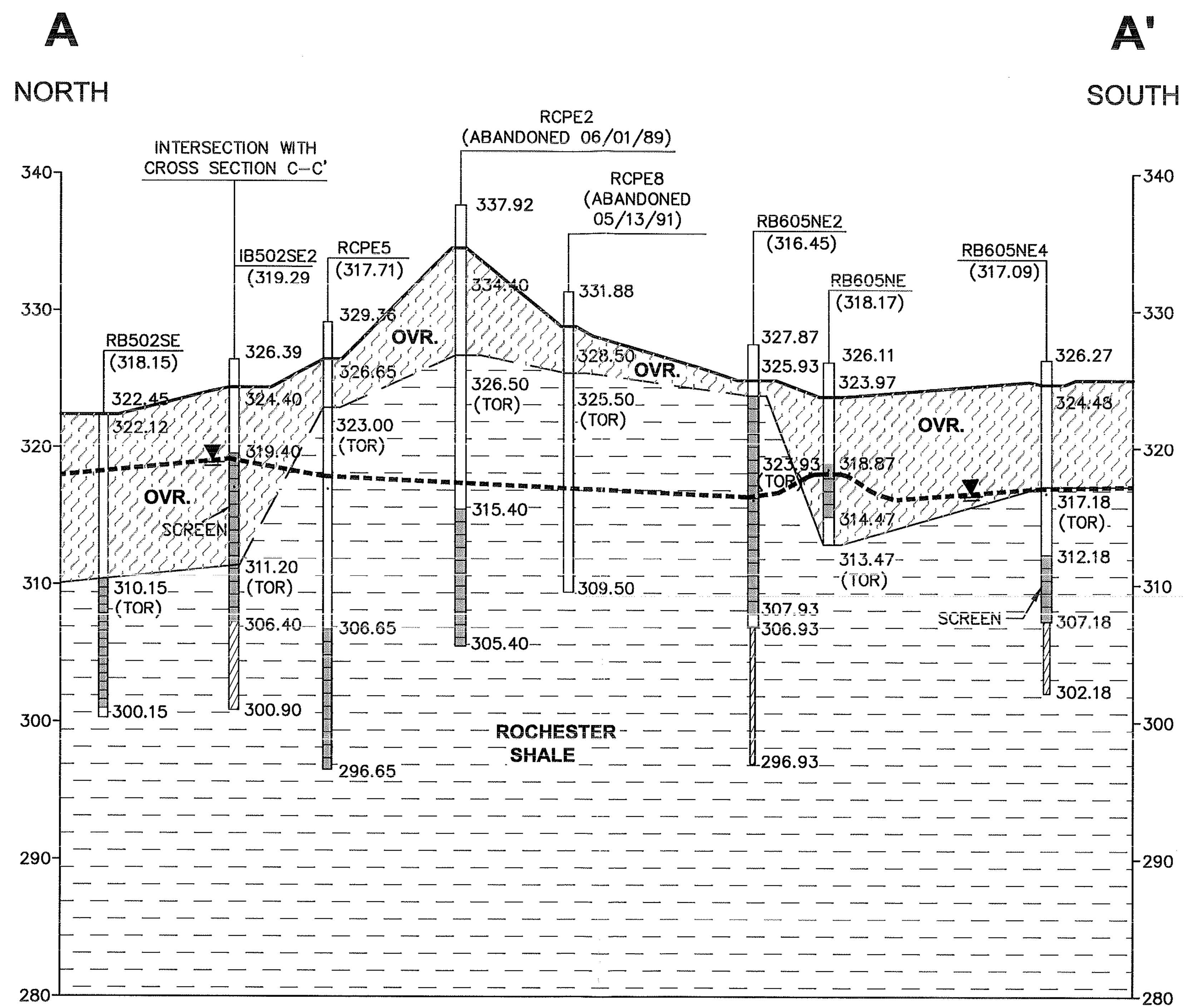
300 0 300

SCALE FEET

SOLD PROPERTY

DEMOLISHED BUILDING

Golder Associates Buffalo, New York	SCALE AS SHOWN	TITLE	
	DATE 10/26/07	INVESTIGATION AREA LOCATION MAP	
	DESIGN DCW		
	CADD RJM		
FILE No. 0539465A575	CHECK		
PROJECT No. 053-9465 REV. 0	REVIEW	SIA-502/605 CMS	FIGURE 2



LEGEND

SB91W ← BOREHOLE/WELL I.D.
(245.51) ← GROUNDWATER ELEVATION
← TOP OF BOREHOLE
← SCREENED INTERVAL
← BOTTOM OF BOREHOLE

- - -▼- - - UPPERMOST GROUNDWATER POTENTIOMETRIC SURFACE

RB642N WELL I.D.

(316.03) GROUNDWATER ELEVATION

ROCHESTER SHALE

OVERBURDEN

NOTES

1.) WATER ELEVATIONS MEASURED ON APRIL 2–APRIL 24, 2007.

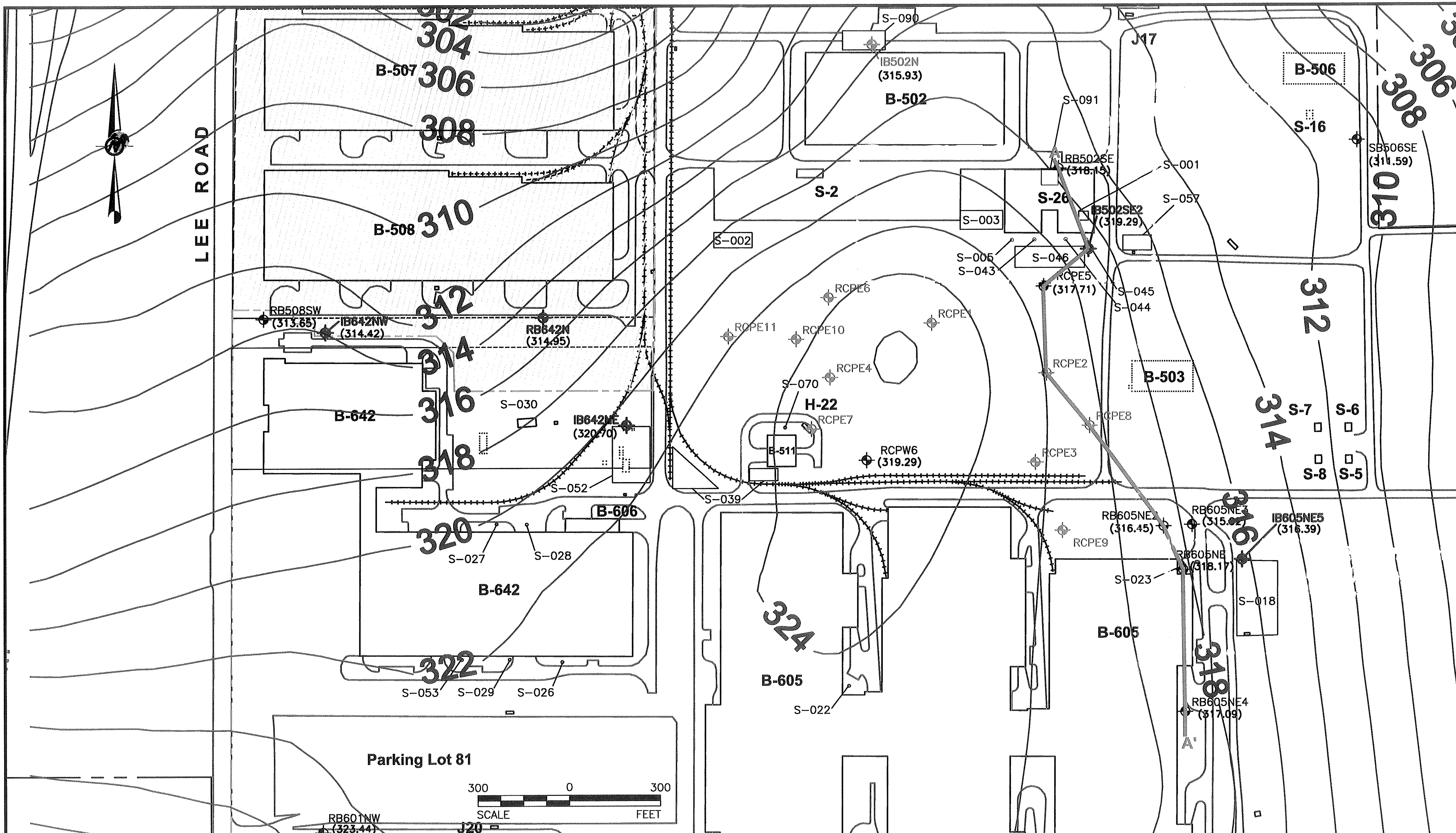
2.) SUBSURFACE MATERIALS AS SHOWN ON THE LEGEND.

3.) CROSS SECTION LOCATION SHOWN ON FIGURE 4.

300 0 300
HORIZONTAL SCALE FEET

10 0 10
VERTICAL SCALE FEET

Golder Associates Philadelphia USA	SCALE AS SHOWN	TITLE
	DATE 10/2/07	**REPRESENTATIVE CROSS SECTION OF SIA-502 / 605 AREA**
	DESIGN RJM	
	CADD AM	
FILE No. 0539465A576	CHECK	
PROJECT No. 053–9465 REV. 0	REVIEW	KODAK SIA-502/605 CMS — FIGURE 3



S-027 | S-030 SWMU

EXISTING MONITORING WELL

ABANDONED MONITORING WELL

RFI-INSTALLED MONITORING WELL

PRE-CMS INSTALLED MONITORING WELL

SOLD PROPERTY

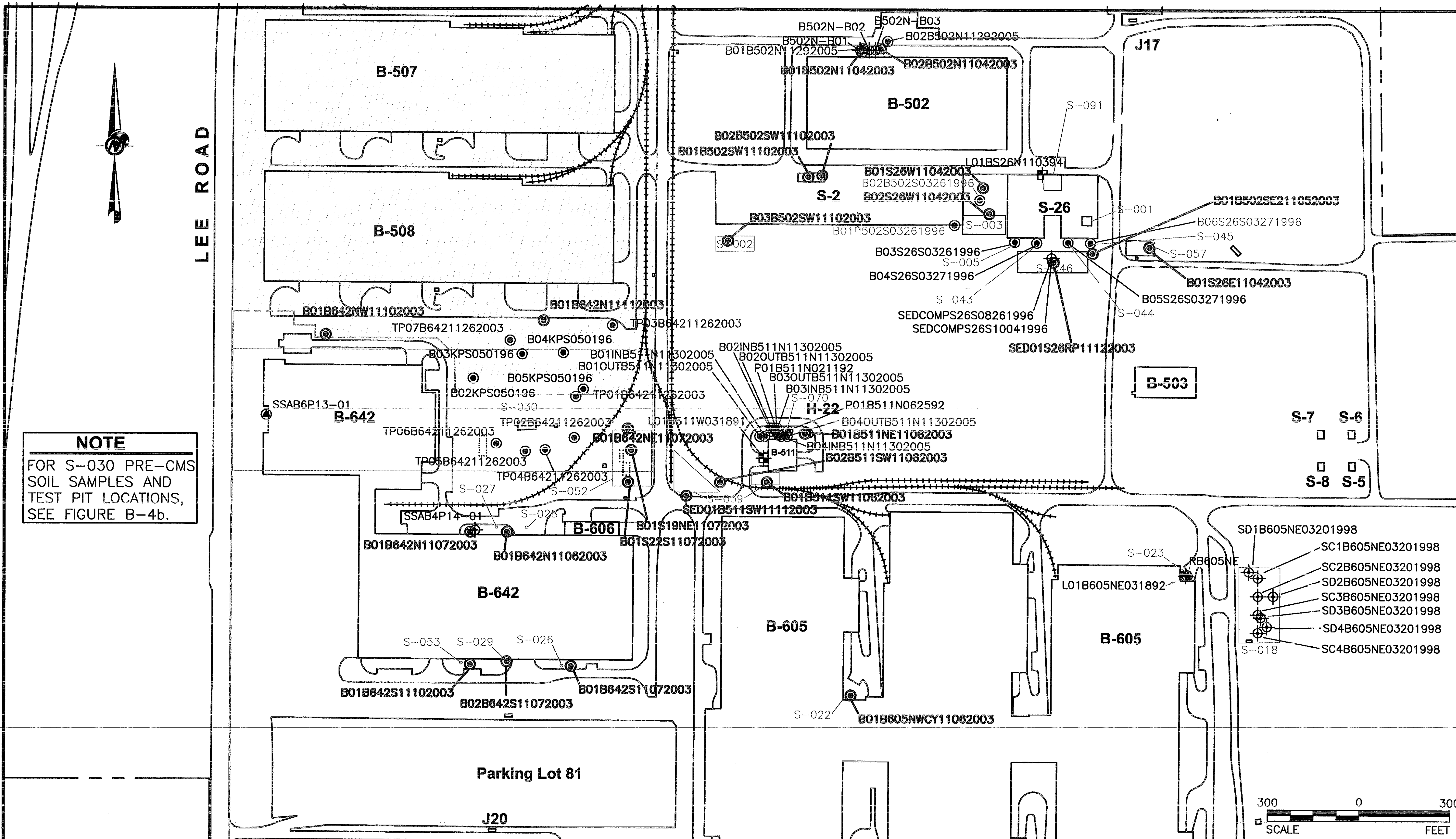
DEMOLISHED BUILDING

A—A' CROSS SECTION LOCATION

PROPERTY LINE

316 — GROUNDWATER CONTOUR

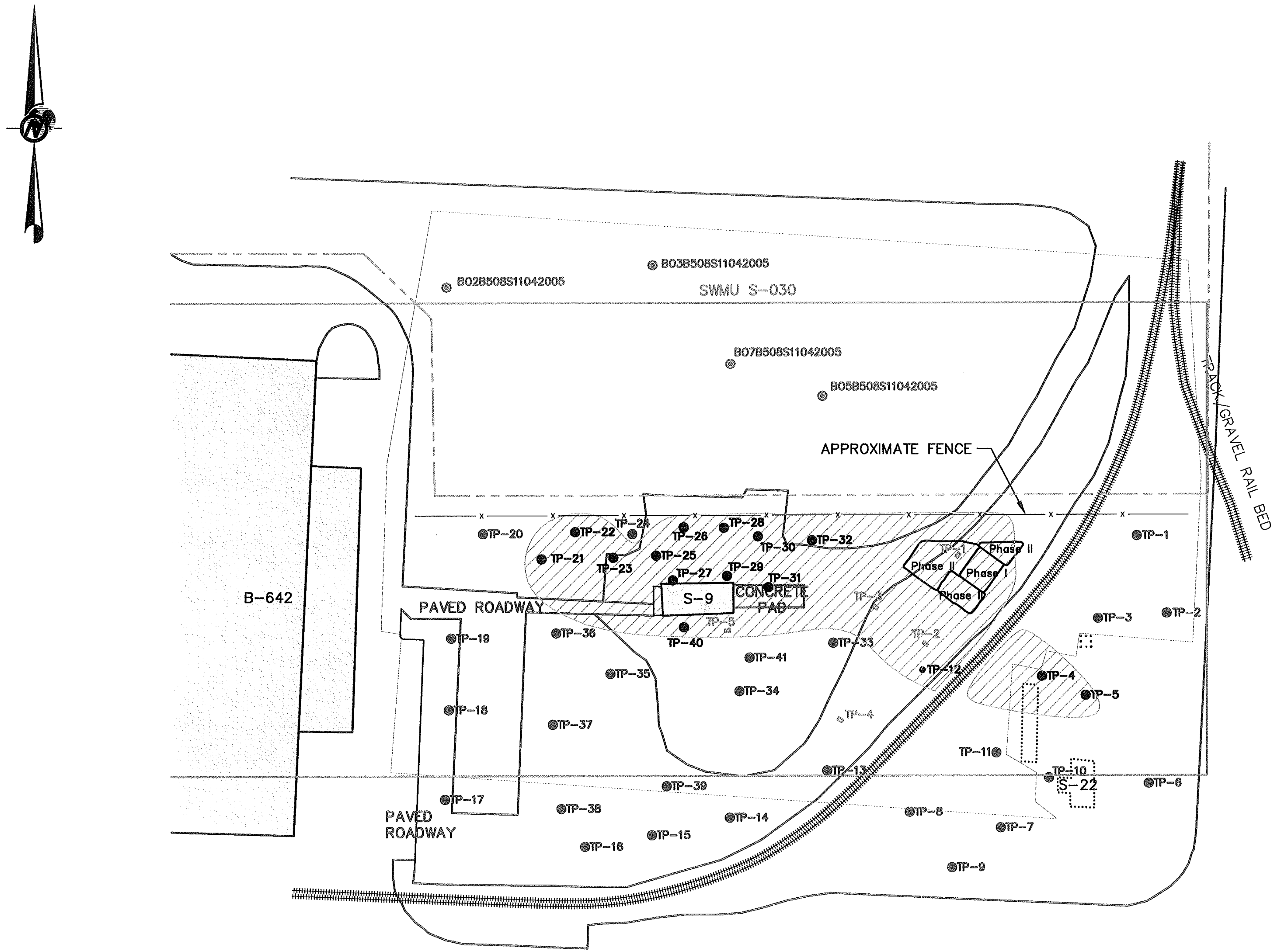
Golder Associates, Buffalo, New York	SCALE: AS SHOWN	TITLE	SIA-502/605 GROUNDWATER ELEVATION CONTOUR MAP SPRING 2007 (SOURCE: SPRING 2007 KPGSAP MAP)
	DATE: 10/2/07		
	DESIGN: DCW		
	CADD: RJM		
FILE No. 0539465A577	CHECK		
PROJECT No. 053-9465 REV. 0	REVIEW		SIA-502/605 CMS — FIGURE 4



S-027 / S-030	SWMU		
	PROPERTY LINE		
	EXISTING BORING SAMPLE LOCATION		EXISTING SOIL SAMPLE LOCATION
	EXISTING LUGGER SAMPLE LOCATION		RFI SOIL SAMPLE LOCATION
	EXISTING PILE SAMPLE LOCATION		RFI TEST PIT SAMPLE LOCATION
			PRE-CMS SOIL SAMPLE LOCATION

Golder Associates
Buffalo, New York

SCALE	AS SHOWN	TITLE	SOIL SAMPLE LOCATION MAP
DATE	10/26/07		
DESIGN	DCW		
CADD	AJN		
FILE No.	0339372A583	CHECK	
PROJECT No.	053-9465 REV. 0	REVIEW	SIA-502/605 RFI
FIGURE	B-4a		



LEGEND

PROPERTY BOUNDARY

SWMU BOUNDARY

GEOPHYSICAL SURVEY BOUNDARY

PHASE III TEST PIT WITH LEAD AND/OR ZINC CONCENTRATION BELOW SOIL/SEDIMENT ACTION LEVEL (400 ppm)

PHASE III TEST PIT WITH LEAD AND/OR ZINC CONCENTRATION ABOVE SOIL/SEDIMENT ACTION LEVEL (400 ppm)

OTHER POST-RFI INVESTIGATIVE BORINGS

TP-3 PHASE II TEST PITS

ESTIMATED IMPACTED AREA BASED ON LAB/XRF ANALYSIS OF ALL EXCAVATIONS AND RFI, PHASE II, AND PHASE III TEST PITS

BUILDING

DEMOLISHED BUILDING

REFERENCES

1.) SITE PLAN WAS COMPILED FROM AIR PHOTOS AND BURIED UTILITY PLANS PROVIDED BY EASTMAN KODAK COMPANY, AND GPS SURVEYING OF SEVERAL LANDMARKS.

NOTE

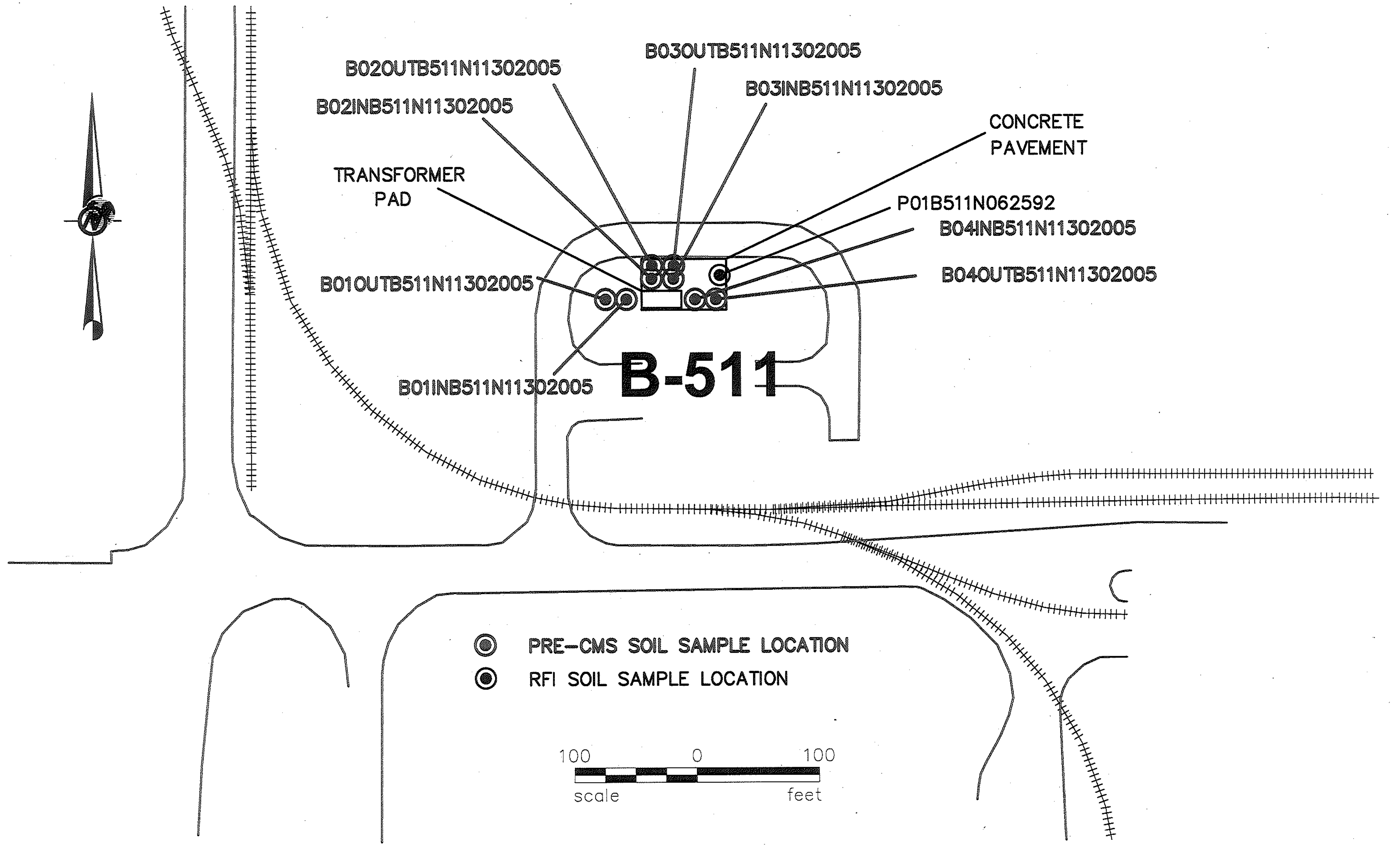
THE FOLLOWING SAMPLES ARE LOCATED IN THE PHASE I AND PHASE II TEST PIT AREA:

- S01VETSEXCE01132006
- S01VETSEXCN06152005
- S01VETSEXCNW01132006
- S01VETSEXCE06152005
- S01VETSEXCNE01132006
- S01VETSEXCS01132006

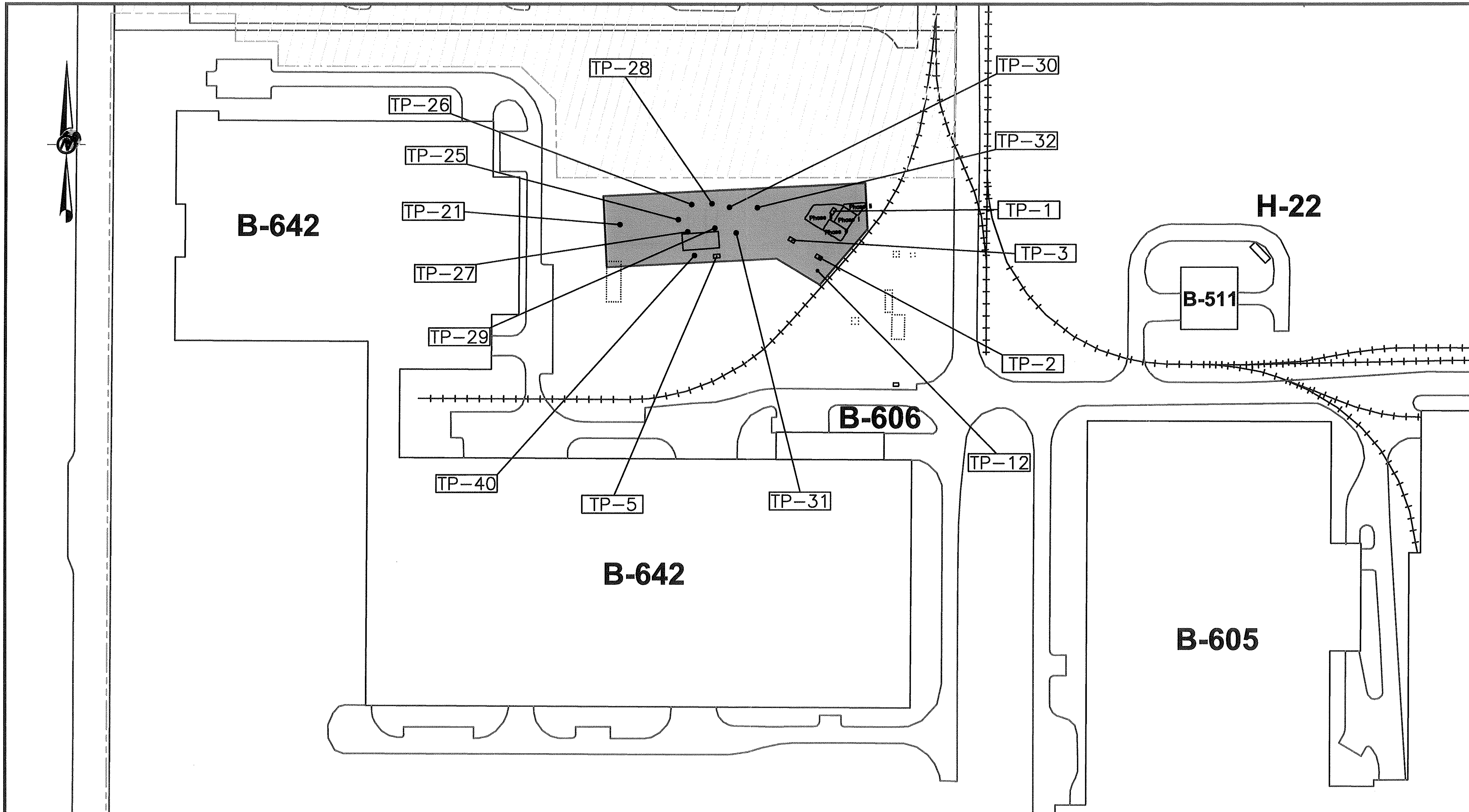
THE SOILS FROM THESE AREAS HAVE SUBSEQUENTLY BEEN EXCAVATED AND DISPOSED.

100 0 100
SCALE FEET

NJ Authorization #24GA28029100 Golder Associates Buffalo, New York	SCALE AS SHOWN	TITLE	
	DATE 10/2/07	SWMU S-030 AREA SOIL SAMPLE LOCATION MAP	
	DESIGN DCW		
	CADD AJN		
FILE No. 0539465A584	CHECK		
PROJECT No. 053-9465 REV. 0	REVIEW	KODAK/SIA-502/605 CMS	FIGURE B-4b



CLIENT/PROJECT SIA-502/605 CORRECTIVE MEASURES STUDY KODAK PARK CORRECTIVE ACTION PROGRAM EASTMAN KODAK COMPANY ROCHESTER, NEW YORK			Golder Associates Buffalo, New York		TITLE B-511 AREA	
DRAWN AJN/RJM	CHECKED	REVIEWED	DATE 10/2/07	SCALE AS SHOWN	FILE NO. 053-9465	JOB NO. 053-9465 / DWG NO. 0539465A580 / FIGURE B-4c



TP-21 SOIL SAMPLE LOCATION/ID

PROPERTY LINE

SOLD PROPERTY

DEMOLISHED BUILDING

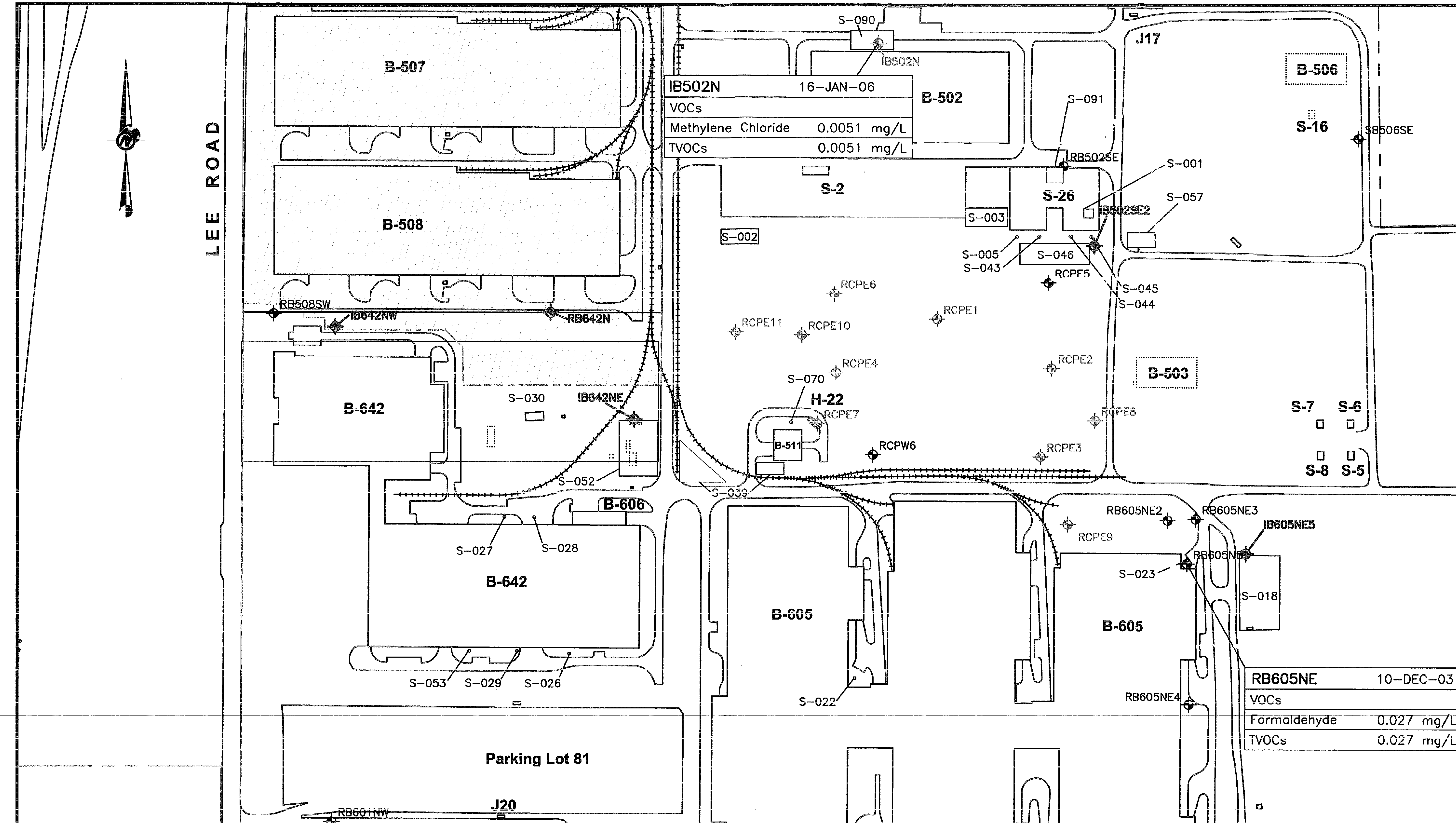
AREA OF POTENTIALLY EXPOSED SOILS TO BE COVERED OR REMOVED

150 0 150

SCALE FEET

Golder Associates
Buffalo, New York

FILE No. 0539465A633	SCALE AS SHOWN	TITLE	AREA DESIGNATED FOR PROTECTIVE COVERING OR SOIL REMOVAL IN SIA-502/605
PROJECT No. 053-9465 REV. 0	DATE 10/2/07		
	DESIGN DCW		
	CADD AJN		
	CHECK		
	REVIEW	FIGURE	5



S-027 S-030 SWMU

PROPERTY LINE

300 0 300
SCALE FEET

SOLD PROPERTY

DEMOLISHED BUILDING

EXISTING MONITORING WELL

ABANDONED MONITORING WELL

RFI-INSTALLED MONITORING WELL

PRE-CMS INSTALLED MONITORING WELL

Golder Associates
Buffalo, New York

SCALE	AS SHOWN	TITLE	EXCEEDANCES OF GROUNDWATER ORGANIC STANDARDS AND TOTAL VOCs
DATE	10/26/07		
DESIGN	DCW		
CADD	RJM		
FILE No. 0539465A578	CHECK		
PROJECT No. 053-9465 REV. 0	REVIEW	SIA-502/605 CMS	FIGURE 6