New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
625 Broadway, Albany, New York 12233-7250
Phone: (518) 402-8651 • FAX: (518) 402-8654
Website: www.dec.state.ny.us

Erin M. Crotty
Commissioner

FINAL STATEMENT OF BASIS

SELECTION OF CORRECTIVE MEASURES TO ADDRESS CONTAMINATION INVESTIGATION AREAS: MIA-301, MIA-329, MIA-WRL and EIA-KL EASTMAN KODAK COMPANY

Kodak Park
City of Rochester, Monroe County, New York

September 2003

The New York State Department of Environmental Conservation has selected the Final Corrective Measures to address the presence of contaminated media at sites identified as MIA-301, MIA-329, MIA-WRL (Weiland Road Landfill) and EIA-KL (Kings Landing), located at the Kodak Park Facility, in Rochester, New York. The proposed remedies were public-noticed from August 6, 2003 to September 21, 2003. During the comment period, on September 11, 2003, the Department held a public meeting at Rochester's Rundell Public Library. Department staff made a presentation explaining the investigations that were performed and the selection of the proposed Final Corrective Measures. The Department has prepared a responsiveness summary listing comments raised during the meeting, followed by the Department's responses. This is included in Appendix A. The Department did not receive any written comments on the proposed remedies.

Comments from the public meeting did not require modification of the proposed remedies. Therefore, the remedies will be implemented as proposed. These measures shall be implemented by Eastman Kodak as the Selected Final Corrective Measures for the four investigation areas listed above.

Date: 9-25-03

By: Stephe Hammond

Stephen Hammond, P.E.
Director, Division of Solid &
Hazardous Materials

APPENDIX A

Responsiveness Summary
Kodak Park Investigation Areas MIA-301, MIA-329, MIA-WRL and EIA-KL

New York State Department of Environmental Conservation
Responsiveness Summary
Remedy Selection for
Kodak Park Investigation Areas MIA-301, MIA-329, MIA-WRL and EIA-KL

The following numbered comments/questions were made verbally at the public availability session that the NYSDEC held on September 11, 2003, at the Rochester Public Library. Each comment is followed by a NYSDEC response.

1) When you investigate these areas, does Kodak tell you about these particular areas? How is that done? Do you follow up with Kodak?

The areas and units being investigated were identified following a review of current and historic site operation information. This process was performed by Kodak, under the review and with input from NYSDEC staff. In addition to questionnaires circulated to Kodak employees to acquire information about current and historic site operations and waste management practices, the information review relied on analysis of historic aerial photographs of Kodak Park. NYSDEC also routinely inspects the areas when investigation plans are being reviewed, to ensure that any areas of concern are addressed.

2) Are you recommending three pumps or is Kodak?

This question was concerning the MIA-301 proposed remedy. The number of wells was proposed by Kodak. The NYSDEC had requested that Kodak propose actions to address groundwater contamination within the source area of this investigation area. In responding this request, Kodak evaluated a number of options to take. Within this evaluation, Kodak ultimately recommended that groundwater collection be undertaken in the source area. The number and placement of wells was proposed by Kodak. The number, placement and projected effect of pumping wells was evaluated by Kodak using a computer groundwater flow model. The flow model has been developed incorporating information from numerous site investigations that have been conducted across Kodak Park. The model is a tool that has been used to simulate groundwater flow, and provides an effective way comparing the expected effects of different groundwater collection designs. The modeling indicates that the three pumping wells should be effective. The NYSDEC will require monitoring to assess the performance of the collection system. If monitoring shows that the system is not effective, the NYSDEC will require modifications.

3) How can you understand how groundwater flows? It runs underground. Is it through the lakes, the rivers or does it just go into the ground?

Groundwater flow is determined through investigations of the subsurface. This includes sampling of soil and rock to determine their groundwater flow characteristics, and degree of continuity both laterally and vertically. It also includes installation of wells to monitor

groundwater elevation and groundwater quality. The elevation measurements provide an indication about the direction of groundwater movement. Groundwater quality (e.g., contaminant concentrations) can also provide information about groundwater flow, since they can act as tracers. Kodak has performed extensive subsurface sampling and installed more than 500 wells across Kodak Park. This information is used to understand groundwater flow at Kodak Park. The groundwater at Kodak Park flows through the pore space surrounding soil particles, and through very small cracks and joints within the bedrock. There are not underground rivers or lakes beneath Kodak Park, only very small features through which groundwater seeps.

4) Do they investigate areas where there are homes?

Yes. There have been a number of investigations within residential areas near and/or adjacent to Kodak Park. The Koda Vista area, located near MIA-329, is a residential area that was investigated during the early 1990s.

5) From Rick Elliott, Monroe County Health Department - Does institutional controls include deed restrictions?

As part of the proposed remedies Kodak will be required to file a notice with the Monroe County clerk, pertaining to the parcels addressed within these investigation areas, where soil and/or groundwater results exceed comparison values. The filings will indicate that use be restricted to industrial/commercial, unless further testing and clean-up actions are taken, such that these use restrictions are no longer warranted.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID & HAZARDOUS MATERIALS

STATEMENT OF BASIS
FOR
KODAK PARK INVESTIGATION AREA MIA-301

FINAL
September 2003

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

USEPA ID No.: NYD980592497
Inactive Hazardous Waste Site Code: 828082

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 for soils and groundwater at Investigation Area MIA-301, located in the eastern portion of Kodak Park Section KPM, in Rochester, New York (see Figure 1). The investigation area is comprised of a grouping of solid waste management units that were identified during the RCRA Facility Assessment. The grouping has been designated MIA-301.

This document:

- Provides a brief overview of the site history and site investigations which were conducted at MIA-301;
- Identifies the proposed remedy and presents the basis for its selection;
- Describes the remedial goals that were considered;
- Solicits public review and comment on the proposed remedy and other plausible remedies; and
- Provides information on how the public can be involved in the remedy selection process.

The New York State Department of Environmental Conservation (NYSDEC or Department) has 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 select a final remedy 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 interim corrective measures that have been undertaken for MIA-301, and the possible remedies to address that contamination.

Proposed Remedy

The Department has tentatively selected the remedy for MIA-301 described below.

The proposed remedy includes:

- a groundwater recovery system in the source area utilizing conventional pumping wells
- an existing groundwater recovery system utilizing a 1520-foot long french drain and two fractured bedrock recovery trenches
- a groundwater monitoring program to assess the effectiveness of the remedy.
- administrative controls to address potential exposure to contaminated soils and groundwater, both currently and in the future.

- an operation and maintenance plan that specifies routine monitoring, inspection, maintenance, and reporting requirements to ensure that site conditions remain protective.

Facility Background

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

The MIA-301 investigation area covers approximately 20 acres and is located in the eastern portion of Kodak Park Section M (KPM). KPM is bounded by Mount Read Boulevard to the east, Interstate 390 to the west, the Koda Vista neighborhood to the north, and approximately Ridgeway Avenue to the south (Figure 1). Development in KPM began in the 1940's, following development of KPE, KPW and KPX, which are all located to the east. KPM has historically been used primarily for photographic paper/film base, toner/copier, and chemical manufacturing. KPM is on the New York State Department of Environmental Conservation Registry of Inactive Hazardous Waste Disposal Sites, listed as Site #828082.

MIA-301 includes Building 301 and a number of other buildings, primarily used for the production of synthetic chemicals, including organic dyes and couplers (see Figure 2). The B-301 complex includes storage facilities for solid and liquid hazardous wastes. These include drum, tank and trailer/lugger offloading and staging areas. There have been a number of spills in the MIA-301 area that have contaminated the groundwater. In the 1990's, Kodak subsequently reconstructed and upgraded the liquid waste storage tanks and transfer station system at B-301.

Numerous subsurface utilities underlie MIA-301, including storm, sanitary and industrial sewers, water, electric, and gas. MIA-301 is connected to the Kodak Park industrial sewer.

In 1998, Kodak completed a RCRA Facility Assessment for Kodak Park. The assessment identified solid waste management units (SWMUs) subject to corrective action requirements. To administer corrective action, SWMUs were grouped into investigation areas, based on geographic and operational concerns. This statement of basis is for the SWMU grouping MIA-301. This grouping includes the 63 SWMUs listed in Table 1 (see Figure 2 for SWMU locations).

The RCRA facility investigation for MIA-301 was completed in 1998. Kodak completed a corrective measures study (CMS) in 2000. In the CMS, Kodak evaluated potentially applicable remedial alternatives. Kodak had already implemented interim corrective measures for the groundwater in the vicinity of MIA-301, so it was assumed that those measures would be a component of the final corrective measures. After reviewing the CMS report, the NYSDEC requested that Kodak conduct additional evaluation of the groundwater flow system and further

evaluate extraction and other remedial technologies for the groundwater. In an addendum to the CMS report, submitted in 2003, Kodak provided this additional information and proposed installing and operating a groundwater recovery system within the MIA-301 area. Other aspects of the proposed remedy remain as outlined in the initial CMS report.

Facility Investigations

The RCRA Facility Investigation (RFI) for MIA-301 was completed in 1998. The investigation area contains 63 solid waste management units (SWMUs) listed in Table 1. Subsurface investigations in MIA-301 were conducted in a number of phases, between 1989 and 1998.

Subsurface Conditions/Groundwater

The field investigations initially focused on the fence line of KPM, and were implemented to determine if off-site contaminant migration was occurring in the overburden and upper bedrock. Additional subsurface investigations were subsequently implemented to more fully assess groundwater conditions in the overburden and bedrock along the eastern edge of KPM, where MIA-301 is located. A total of approximately 46 wells have been installed in and near the MIA-301 area.

The investigations identified a number subsurface zones that have contrasting hydrogeologic properties. In order of increasing depth, these include:

- Overburden - Unconsolidated materials, primarily glacially derived sands, silts, and clays and in some cases fill material including construction/demolition debris and boiler ash. The water table generally occurs in this interval.

- Top-of-Rock - The uppermost bedrock, typically moderately fractured sandstone/siltstone of variable thickness but generally on the order of 15-20 feet. The top-of-rock and overburden are collectively referred to as the upper flow zones. In MIA-301 the upper bedrock is generally more competent and less fractured than in section of Kodak Park located to the east of KPM.

- Intermediate Grimsby - Sandstone/siltstone with relatively few fractures, exhibiting generally low hydraulic conductivity. This unit functions as an aquitard and is not considered a flow zone for groundwater.

- Grimsby/Queenston (GQ) - Interval of moderately fractured (conductive) bedrock occurring within approximately 15 feet above or below the contact between the Grimsby Sandstone and the Queenston Shale. The GQ and the underlying Queenston are collectively referred to as the lower bedrock flow zones.

- Queenston Shale - Interbedded siltstones and shales with no discernible horizontal

interval of elevated hydraulic conductivity. This zone was not investigated within MIA-301, but was for the Kodak Park section KPW, located to the east.

Figure 3 shows the vertical relationship between these zones in the MIA-301 area. Figures 4, 5, and 6 show the groundwater potentiometric surface and general flow directions for overburden, top-of-rock and Grimsby/Queenston, respectively. For the overburden zone groundwater flow in the vicinity of B-301 is generally to the northwest, but there is a mound just west of the B-301/304 area, where there is radial flow away from the mound. Sewer lines affect the groundwater flow pattern, especially for the overburden zone. There is also a large (12 million gallon) underground water storage reservoir west of B-311 that deflects flow to the west towards B-324 and to the south, towards industrial sewer located north of B-331. For the top-of-rock, a somewhat similar flow pattern is present, with the exception that in the eastern part of the Study Area horizontal flow is to the north-northeast. For the GQ, the horizontal component of flow is generally to the northeast.

The principal groundwater contaminants are primarily volatile organic compounds (VOCs), although a number of semi-volatile organic compounds (SVOCs) were also detected. Figures 7 and 8 show total volatile organic contaminant concentrations for the overburden and top-of-rock flow zones, respectively. The most common exceedances were for benzene, toluene, ethylbenzene, xylene (BTEX) compounds. Contaminant concentrations are highest in the center of MIA-301, to the south of B-331. A few contaminants were detected in the GQ flow zone, but at low concentrations. Also groundwater flow rates for the GQ zone are very low. For these reasons, the underlying Queenston was not investigated.

MIA-301 has a history of numerous releases of chemicals to the environment, mostly related to chlorinated and non-chlorinated solvents used in the B-301 operations. Kodak has reviewed groundwater data against criteria commonly used to screen for the likely presence of non-aqueous phase liquid (NAPL). Based on the groundwater quality screening, Kodak concluded that NAPL was likely present within MIA-301, at least historically. Kodak has identified areas within MIA-301 as potential NAPL locations. These are shown on Figure 9. One is located near a former tank farm where elevated concentrations of non-chlorinated VOCs has been found. This type of contaminant would tend to form a floating or light NAPL because it is less dense than water. The other area had elevated concentrations of chlorinated solvents, a class of compounds would tend to form a dense NAPL.

The RFI report included an assessment of the amount of VOC contaminant mass inferred to be present in the subsurface within MIA-301 as NAPL. The assessment utilized available soil and groundwater contaminant concentrations and assumptions about the physical properties of the subsurface materials, resulting in an estimate of the inferred contaminant mass of 1,305 tons.

Soils

Soil characterization has been conducted for various reasons in MIA-301. In addition to soil sampling specifically for the RFI, Kodak has tested soil during well installations, for tank and

transfer station closures and upgrades, and for other routine site activities. The overburden ranges in thickness from about 18 feet to greater than 31 feet, with the thickest deposits located in the southeastern portion of the study area. The investigations have identified three types of unconsolidated deposits in KPM: imported fill, lacustrine deposits and glacial till. The fill, consisting of sand, silt, gravel, mixed with minor amounts of wood, bricks, cinders, slag and glass is the uppermost deposit and is ranges in thickness upwards to 20 feet. The lacustrine deposit is next and contains relatively coarse-grained sands and gravels, likely derived from reworking of the underlying glacial till. The glacial till is discontinuous in the study area and generally consists of dense, poorly sorted granular material (sand, silt, gravel with little clay). Till is absent in the northwestern portion of the study area, where it appears to have been removed by post-depositional erosion.

As evaluated in the CMS report, the soil quality data set includes approximately 50 samples collected from about 35 location within MIA-301. Soils data were screened against NYSDEC TAGM 3028 and TAGM 4046 comparison values. For the VOCs, there were exceedances at only 8 locations and were most commonly for acetone and xylene. There were also exceedances for methylene chloride and benzene, at one location each. For the SVOCs, there were exceedances at only 6 locations, for SVOCs including benzo(a)pyrene, benzo(a)anthracene, dibenzo(a)anthracene, and chrysene. For the metals, most locations had exceedances for one or more metals, with exceedances being most common for arsenic and beryllium. Arsenic and beryllium levels in and around Kodak Park commonly exceed comparison values, and do not appear to be related to SWMUs within the investigation area. It appears that background concentrations in the area are often above the comparison values. Iron and zinc were also frequently detected above TAGM values, but are constituents typical of glacially derived soils in the area. Other metals exceedances were noted for antimony, barium, cadmium, chromium, copper, lead, mercury and nickel.

Contaminated soils were excavated and removed from the former tank farm location during the STIP upgrade activities. Much of the STIP work took place at a tank farm complex located to the west of B-301.

Summary of Facility Risks

Baseline Exposure Scenarios

As part of the CMS report, a screening level risk assessment (SLRA) was conducted to identify potential contaminants within and from MIA-301 that may pose human health or ecological risks. The assessment also identified receptors and pathways to evaluate the potential risk present from the identified contaminants. For a potential environmental risk to exist, a contaminant needs to be present above concentrations that can cause an adverse effect, a receptor must be present, and an exposure pathway must be completed from the contaminant to the receptor. These three components must all exist simultaneously for a potential risk to exist. However, all three components coexisting does not pre-suppose a risk is present, only that the potential for a risk is present.

Soils

The tiered screening process used NYSDEC Technical Administrative Guidance Memorandums (TAGM) 4046 and 3028 comparison values and USEPA guidance documents to identify contaminants that may pose human health or ecological risks. TAGM 3028 was used to identify contaminants posing potential direct ingestion hazards under a residential use scenario. These exceedances are summarized in Table 1.1. The next step in the screening was used to identify contaminants posing potential direct ingestion hazards under a industrial/commercial (I/C) use scenario. These exceedances are summarized in Table 2.

As a result of the screening process described above, arsenic and lead were retained for further evaluation in the Conceptual Exposure Model (CEM). This evaluation showed that there are three locations that are not currently covered by buildings or other protective cover where there are exceedances (see Figure 10). Kodak has proposed establishing protective cover in these areas to block this exposure pathway, and placing institutional controls to protect against possible future exposures.

The reasonably anticipated future use of MIA-301 is also industrial. This facility is listed in the registry of *Inactive Hazardous Waste Disposal Sites in New York State* that is published by the NYSDEC as Site Code 828082. The facility is also under federal hazardous waste management facility permit, and has applied for a NYSDEC 6NYCRR Part 373 hazardous waste management facility permit. Due to these circumstances, use of MIA-301 for purposes other than industrial are not expected or likely.

Kodak has recommended continued use of institutional controls to limit potential exposure associated with subsurface excavations. This excavation control plan imposes conditions, including health and safety provisions, that must be followed during the excavation and management of subsurface materials (soil) at the site.

Groundwater

Groundwater in the vicinity of MIA-301 is generally contaminated above New York State Groundwater Standards or other relevant comparison criteria, that are typically based on protection of drinking water quality. Reference values used for MIA-301 included NYSDEC TAGM 3028 "groundwater action levels" and NYSDEC TOGS 1.1.1 criteria for groundwater. Exceedances for inorganic constituents (metals), volatile organic compounds, and other organic constituents are summarized in Tables 3, 4, and 5, respectively.

Groundwater at and in the vicinity of MIA-301 is not used as a drinking water source, due to availability of publicly supplied water, and the generally low yield and hardness of the groundwater in this area. Therefore, there is no complete direct ingestion exposure pathway associated with the groundwater exceedances.

As part of the CMS, and in the addendum to the CMS, Kodak used a groundwater flow model to evaluate the flow system and fate of the groundwater in this area. The model used particle tracking to follow potential paths that contaminants would be expected to take through migration in the groundwater (see Figures 11 and 12 for particle tracking results for the overburden and top-of-rock zones, respectively). Kodak concluded that particles that originated within the area where TVOCs exceed 1 ppm would eventually be captured by either the Northern KPM Migration Control System or industrial sewers. The model indicated potential discharge of groundwater to a storm sewer in a portion of the investigation area. An evaluation of this flow, included in an addendum to the CMS, concluded that contaminant concentrations in this discharge would not exceed New York State ambient water quality criteria. The sewer system in this area had been constructed so that under base flow (i.e., typical) conditions, this groundwater would be directed to the Kodak industrial sewer for treatment at Kodak's Kings Landing plant. Only during high flow events (associated with rainfall events) would a fraction of this groundwater end up discharging to the storm sewer. Kodak has subsequently reconstructed the sewer connections in this area so all flow is now directed to the industrial sewer system for treatment at Kings Landing.

The conclusion of the SLRA and the addendum to the CMS was that no unacceptable risks associated with groundwater were identified, and no additional risk management measures are needed for mitigative purposes. For soils no unacceptable risk were identified, but placement of protective cover was recommended at 3 locations where I/C soil screening exceedances were noted (see Figure 10). Restrictions are needed to limit any future use of the site to industrial/commercial purposes. Also, to ensure the management of potential risk at MIA-301, the following actions need to be performed:

- Maintenance of the paved/covered surfaces in areas of I/C soil screening level exceedances to ensure that surface soils remain covered and not easily accessible;
- Continued use and enforcement of institutional controls (soils management plan); and,
- Continued operation and maintenance of the sewers, associated MIA-301 groundwater monitoring systems and implementation of appropriate deed notices restricting future use.

Remedial Goals

With the nature and extent of site contamination characterized and the potential risks identified, remedial goals were established. The following goals have been identified:

1. Soils - Reduce exposure potential by utilizing the soils management plan (Excavation Master Plan II) for subsurface activities conducted in MIA-301 and by imposing deed notices so that future owners are aware past uses of this area, and restricting future use of this area as long as soils concentrations exceed residential use comparison values. Inspect and maintain paved/covered surfaces in areas of I/C screening level exceedances to ensure that surface soils remain covered and not easily accessible.

2. Groundwater -

a. Control migration of contaminated groundwater to protect human health and the environment through measures precluding off-site migration and exposure due to the groundwater plume.

b. Source control measures to recover heavily contaminated groundwater, preventing the expansion of the contaminant plume in the upper flow zones,

c. Long-term operation of the groundwater controls to reduce the contaminant mass in MIA-301 and improve groundwater quality in this area. The groundwater controls shall remain in operation until such time as Kodak can demonstrate to the Department's satisfaction that any residual contamination will not result in an exceedance of the groundwater quality criteria at the point of exposure.

Remedial Actions to Date

Kodak has taken a number of actions to control groundwater contamination at MIA-301. These have included eliminating potential sources of contamination, such as the upgrade/replacement of tank-storage facilities and transfer stations used for chemical management. In the 1990s, Kodak completed an upgrade of the tank farm located to the west of B-301, as part of the Storage Tank Improvement Program. The tanks and associated piping were replaced by a new tank system, providing secondary containment of possible spills, including tank leak detection systems.

Evaluation of Alternatives

In the Corrective Measures Study Report two remedial alternatives were evaluated. Both included the same action for the soils. Alternative 1 included adoption of the existing interim corrective measures for groundwater as the final measure. Alternative 2 included the components of Alternative 1 with the addition of a groundwater extraction system to the west of the B301/304 complex. Subsequently, in response to NYSDEC comments, Kodak further evaluated remedial alternatives for the groundwater. This included the following remedial alternatives:

a. Re-evaluation of the CMS Alternative #2 Groundwater Extraction System;
b. Oxygen Injection (Chemical/Biological Oxidation);
c. Chemical Oxidation (Hydrogen Peroxide/Fenton's Reagent); and
d. A Fractured Rock Trench and Groundwater Extraction System.

The groundwater extraction alternatives (Items 1 and 4, above) would be expected to provide similar performance in controlling and recovery contaminated groundwater. When compared to existing conditions, where groundwater collection is through discharge to the North KPM Migration Control System or passive discharge to the industrial sewer, the groundwater extraction alternatives would be expected to provide similar mass removal performance, but

would have the advantage that they would limit potential future expansion of the groundwater plume. Item 1 would involve installing and operating conventional pumping wells within the area of highest groundwater contamination. Kodak's preliminary evaluation, based on groundwater flow modeling, is that three pumping wells would provide effective control of the primary area of concern (see Figure 13 for proposed pumping well locations) . When comparing Items 1 and 4 (conventional pumping wells versus a fractured rock trench, Kodak concluded that the trench would not result in appreciable hydraulic performance differences, but would be more difficult to implement due to access requirements and vibrational concerns associated with blasting to construct such a system. Therefore, Kodak did not pursue additional evaluation of the Fractured Rock Trench as a groundwater extraction technology for MIA-301.

Another alternative that was considered was Oxygen Injection. This technology involves injecting oxygen to enhance biological activity leading to increased contaminant degradation rates. A critical element with this technology is the system used to distribute the oxygen. The delivery system would require a high number and density of delivery points due to the relatively low conductivity of the subsurface materials in the MIA-301 area. The technology vendor that Kodak contacted estimated that approximately 160 injection points would be needed. Oxygen injection can accelerate biodegradation of certain classes of contaminants, but the biodegradation is limited to the contaminant mass present in the dissolved phase. The inference from the RFI is that much of the subsurface contaminant mass is present as NAPL, a form that is not accessible to significant biologic activity. The dissolution of the NAPL contaminant mass into the dissolved phase in groundwater is the rate limiting step for biodegradation processes. This would mean that oxygen injection would need to continue during the dissolution of the contaminant mass, which in MIA-301 is expected to be in excess of 30 years. Oxygen injection is generally used as a polishing step where only relatively low concentrations of dissolved phase contamination is present, where the relatively short duration (1 to 2 year) oxygen injection period can be used. Oxygen injection would also be expected to have a limited effect on addressing chlorinated VOCs in the TOR zone, which was an area of concern to the NYSDEC because of migration potential. For these reasons, Kodak did not request that Matrix, a vendor of such technology, develop a proposal or cost estimate for a pilot study of this technology. However, Kodak did prepare a preliminary cost estimate for such a full-scale system.

Another alternative that was considered was Chemical Oxidation (Hydrogen Peroxide/Fenton's Reagent). This technology involves a direct reaction between the contaminants and the oxidizing agent, without reliance on biological activity, as in the oxygen injection alternative discussed above. In order to work, the oxidizing agents need to contact the contaminants, so a critical element with this technology is the system used to distribute the oxidizer. The delivery system would require a high number and density of delivery points due to the relatively low conductivity of the subsurface materials in the MIA-301 area. The technology vendor that Kodak contacted estimated that approximately 240 injection wells would be needed. Chemical oxidation is predicted to be more effective at reducing contaminant mass than oxygen injection. However, bench scale and pilot testing were advised by the technology vendor to better assess potential site-specific performance. This technology would involve an exothermic reaction in the subsurface that could generate water vapor and cause other effects on the physical properties of

the soils in the area. The substantial inferred mass of contaminants means that a very large amount of reagent would need to be applied. Also, to be effective the reagent needs to contact the contaminant. Because of relatively heterogeneous subsurface conditions in MIA-301 it would be very difficult to ensure that delivery reaches all contaminants and that sufficient amounts of reagents reach areas where they are needed. Due to these uncertainties, and the high cost involved with this technology, Kodak did not recommend application of this technology in MIA-301.

Summary of Proposed Corrective Action

Based on the results of the CMS report and the supplemental information presented in the previous section, the Department has selected a remedy for MIA-301 that includes the following primary elements:

- groundwater extraction within MIA-301 consisting of conventional pumping wells (per Figure 13). The purpose of these wells is prevent expansion of the groundwater plume through source control. These wells will also serve to recover contaminant mass from the subsurface. Extracted groundwater will be discharged to the industrial sewer for treatment at Kodak's Kings Landing Wastewater Purification Plant (KLWPP), located next to the Genesee River in KPE.

- groundwater extraction using the North KPM Migration Control System. This system includes an existing 1520-foot long french drain and two fractured bedrock groundwater collection trenches that is located to the north of MIA-301. This element provides hydraulic containment of the groundwater, ensuring that contaminants that have migrated north from MIA-301 are captured and treated. Groundwater collected by this system is also treated at Kings Landing.

- a groundwater monitoring program to assess the effectiveness of the remedy.

- an operation and maintenance plan for the groundwater recovery systems. This plan will specify routine monitoring, maintenance, and reporting requirements to ensure that the systems operate as designed.

- implementation of institutional controls/cover for soils that pose a potential exposure pathway under current conditions.

- an inspection and maintenance plan for paved/covered surfaces in areas of industrial/commercial soil screening level exceedances to ensure that surface soils remain covered and not easily accessible.

- administrative controls to address potential exposure to contaminated soils and groundwater.

The remedy that the Department is proposing be implemented for MIA-301, is also the alternative that was recommended in a Supplemental Evaluation of Corrective Measures Alternatives that Kodak submitted in 2003. This report, the CMS report and related environmental investigation reports for MIA-301 are available for review at the NYSDEC Region 8 office located in Avon and at the Kodak Park Neighborhood Information Center located in Rochester.

In addition to the active groundwater actions outlined above, a significant portion of the groundwater from MIA-301 infiltrates into the industrial sewers located within and near MIA-301. The active and passive collection of groundwater will eliminate potential future risk to offsite residents associated with contaminant exposure from groundwater migration. They will also remove contaminant mass from the subsurface environment in MIA-301. This should eventually result in decreasing contaminant concentrations in the groundwater, although levels would be expected to remain above New York State groundwater criteria for an extended period of time.

The remedy will include a groundwater monitoring program to ensure that the remedy meets its design objectives. This program will provide a means of identifying and correcting problems that may develop in the future. The program will also provide data that can be used to aid in the design of enhancements to the remedy that may be needed in the future. Based on the investigations, the primary need is to control the migration of contaminated groundwater. Facility upgrades that Kodak has implemented for the tank systems and transfer stations have reduced the potential for future releases to the environment in this area.

The actions for the groundwater will also address potential contaminant leaching from soils, so the only exposure associated with soils that needs to be considered is direct contact/ingestion. These exposures will be controlled through periodic inspection and maintenance of soil cover in areas where industrial/commercial screening criteria were exceeded, and through use of an approved soils management plan (Excavation Master Plan II) that specifies the procedures and controls, that must be followed when conducting excavation activities within Kodak Park. The excavation plan specifies routine procedures designed to minimize potential exposures associated with soil excavation activities. The proposed remedy was selected with the understanding that the area is in industrial use, and that the reasonably anticipated future use of this area is also industrial. To ensure this, deed restrictions will be placed on areas where soil concentrations exceed residential use comparison values.

Evaluation of the Proposed Remedy

The proposed remedy was evaluated for technical feasibility, environmental performance, protectiveness, institutional requirements and cost. The proposed remedy is technically feasible, and relies on routinely available equipment and engineering practices. The technologies that have been proposed are already in use at other locations within Kodak Park. Although there is a high density of subsurface utilities within MIA-301, conventional pumping well installation does

not require significant access, so this should not impede constructing the remedy.

The environmental performance of the groundwater measure was evaluated through computer flow simulations to assess groundwater fate for water from MIA-301. These evaluations show that the proposed measures will effectively contain the groundwater and control migration from the source area, limiting further expansion of the plume. Contaminant levels exceed groundwater quality criteria currently and are expected to remain so for an extended period of time due to the inferred presence of NAPL/contaminant mass within the subsurface. Dissolution of the contaminant mass is expected to control the restoration of groundwater quality at MIA-301.

Groundwater flow modeling information shows that the proposed remedy effectively eliminates plausible groundwater exposure pathways through containment and are adequately managed or blocked by existing administrative and institutional controls. Potential exposures to soils are effectively controlled through administrative and institutional controls, restricting site use and access, and imposing controls that need to be followed when subsurface excavation work is undertaken.

There are not any institutional impediments associated with implementation of the proposed remedy. The design of the extraction system will be subject to review and approval by NYSDEC. There will not be a need for permitting the groundwater treatment process since Kodak's existing, permitted Kings Landing Treatment facility will be utilized.

The total 30-year costs for the proposed remedy are estimated to be $2.8 million (net present value cost @ 5% interest is approximately $1.7 million). The addendum to the Corrective Measures Study (May 2003) provides a breakdown of these costs.

The NYSDEC has determined that the proposed remedy satisfies the selection criteria and recommends that this remedy be implemented as the final corrective measure for MIA-301. The proposed remedy adequately addresses potential threats to the environment and human health, associated with MIA-301.

Public Participation

NYSDEC solicits public comment on the proposed action before making a final determination about selection of a remedy for MIA-301. The NYSDEC will issue a responsiveness summary if comments are received during the comment period.

Documents about the proposed remedy selection have also been placed in local document repositories. Copies of this Statement of Basis, the Fact Sheet, the RFI Report, the Corrective Measures Study Report and supplemental evaluation of alternatives were made available for public review.

REFERENCES

Blasland and Bouck, 1989, Health Related Study: Koda-Vista Groundwater Sampling; Technical Memorandum.

Blasland and Bouck, 1990, KPM Northern Fenceline Groundwater Quality Assessment. Blasland and Bouck Engineers, Syracuse, New York.

Blasland, Bouck & Lee 1991. Interim Report, Hydrogeologic Investigation, KPM. Blasland & Bouck Engineers, Syracuse, New York.

Blasland, Bouck & Lee, 1992. Preliminary Site Assessment, KPM Order on Consent. Blasland & Bouck Engineers, Syracuse, New York.

Blasland, Bouck & Lee, 1998. MIA-301 RCRA Facility Investigation Report, Kodak Park Corrective Action Program, Eastman Kodak Company, Blasland, Bouck & Lee, Inc., October 1998.

Eastman Kodak Company, 1992 through 2002. Kodak Park Groundwater Extraction Systems Performance Evaluation Reports, Kodak Park, Rochester, New York, 1992 through 2002.

Eastman Kodak Company, 1993a. RCRA Facility Investigation: Description of Current Conditions for the Kodak Park Corrective Action Program: Kodak Park Facility, Eastman Kodak Company, Rochester, New York, December 8, 1993.

Eastman Kodak Company, 1993b. Part E, Corrective Requirements, 6NYCRR Part 373 Permit Application for Eastman Kodak Company, Kodak Park Facility, August 1993, revised March 1998.

Eastman Kodak Company, 1993c. Kodak Park Groundwater Sampling and Analysis Plan, Rochester, New York, Revised 1999.

Eastman Kodak Company, 1994, RCRA Facility Investigation, Pre-Investigation Evaluation of Corrective Measure Technologies, Kodak Park, Rochester, New York, June 1994.

Eastman Kodak Company, 1996. Excavation Management Plan II, Kodak Park Facility, Eastman Kodak Company, Rochester, New York, Revised June 1999.

Eastman Kodak Company, 2003. Cost Estimate Information - MIA-301, Kodak Park Facility, Eastman Kodak Company, Rochester, New York, May 2003.

Golder Associates Inc., 2000. MIA-301 Corrective Measures Study Report, Kodak Park Corrective Action Program, Eastman Kodak Company, Golder Associates Inc., February 2000.

Golder Associates Inc., 2003. Supplemental MIA-301 Groundwater Modeling and Additional Evaluation of MIA-301 CMS Alternatives, Kodak Park Corrective Action Program, Golder Associates Inc., March 2003.

New York State Department of Environmental Conservation, 1994. HWR-94-4046, Technical and Administrative Guidance Memorandum 4046, Determination of Soil Cleanup Objectives and Cleanup Levels, January 24, 1994.

New York State Department of Environmental Conservation, 1997. Technical Administrative Guidance Memorandum 3028, "Contained-in Criteria for Environmental Media", November 30, 1992, Revised March 14, 1997.

New York State Department of Environmental Conservation, 1998. Technical Operational Guidance Series (TOGS) 1.1.1, Ambient Water Quality Criteria, as revised June 1998.

United States Environmental Protection Agency, 1996. Corrective Action for Releases From Solid Waste Management Units at Hazardous Waste Facilities, Proposed Rule. Federal Register Vol.65, No.85, May 1, 1996.

file: lmt\kpm\MIA-301 statement of basis draft 2003.wpd

TABLE 1*
SWMU DESCRIPTION SUMMARY
MIA-301 CMS
KODAK PARK, ROCHESTER, NEW YORK

Unit ID	Building	Unit Type	Status
M-002	301	Container Storage	□
M-003	301	Sump	■
M-004	301	Transfer Station	□
M-005	302	Container Storage	■
M-006	301	Trap Tank	■
M-007	301	Trap Tank	■
M-008	301	Trap Tank	■
M-009	301	Trap Tank	■
M-010	301	Tank Storage	■
M-011	302	Sump	■
M-012	302	Trap Tank	■
M-013	302	Trap Tank	■
M-014	302	Trap Tank	■
M-015	302	Trap Tank	■
M-016	303	Marshaling Area	□
M-017	303	Sump	■
M-018	303	Trap Tank	■
M-019	303	Trap Tank	■
M-020	303	Trap Tank	■
M-021	303	Trap Tank	■
M-022	303	Trap Tank	■
M-023	304	Trap Tank	■
M-024	304	Trap Tank	■
M-025	304	Trap Tank	■
M-026	304	Trap Tank	■
M-027	304	Trap Tank	■
M-028	304	Trap Tank	■
M-029	304	Trap Tank	■
M-030	304	Trap Tank	■
M-031	304	Trap Tank	■
M-033	305	Silver Recovery Area	■
M-083	323	Trap Tank	■
M-084	323	Tank Storage	■

Key:

■ Further Action
□ No Further Action

Notes:

* From Kodak MIA-301 RCRA Facility Investigation Report Table 1-1, Blasland, Bouck & Lee, 1998.

TABLE 1*
SWMU DESCRIPTION SUMMARY
MIA-301 CMS
KODAK PARK, ROCHESTER, NEW YORK

Unit ID	Building	Unit Type	Status
M-086	325	Marshaling Area	□
M-096	325	Trap Tank	■
M-097	325	Trap Tank	■
M-098	325	Trap Tank	■
M-099	325	Trap Tank	■
M-100	325	Trap Tank	■
M-101	325	Tank Storage	■
M-102	325	Tank Storage	■
M-120	337	Marshaling Area	□
M-132	325	Transfer Station	■
M-133	323	Transfer Station	■
M-135	302	Trap Tank	■
M-136	302	Sump	■
M-137	302	Sump	■
M-138	302	Sump	■
M-139	303	Sump	■
M-140	303	Sump	■
M-141	303	Sump	■
M-142	325	Container Storage	■
M-143	327	Container Storage	■
M-144	327	Container Storage	■
M-164	302	Release	■
M-165	325	Release	■
M-166	325	Release	■
M-175	304	Container Storage	□
M-176	325	Container Storage	□
M-181	331	Container Storage	■
M-228	304	Release	■
M-243	325	Container Storage	□
M-244	303	Container Storage	□

Key:

■ Further Action
□ No Further Action

Notes:

* From Kodak MIA-301 RCRA Facility Investigation Report Table 1-1, Blasland, Bouck & Lee, 1998.

TABLE 1.1
KODAK AREA MIA-301
SUMMARY OF CHEMICAL SCREENING FOR
SOIL CONSTITUENTS EXCEEDING TAGM 3028 SOIL ACTION LEVELS

Compound or Substance	CAS Number	Total Number of Samples Submitted for Analysis	TAGM 3028 SAL (mg/kg)	Maximum Concentration of Analyte (mg/kg)	Number of Samples Above TAGM 3028 SAL	Percentage of Samples Above TAGM 3028 SAL
METALS*						
ANTIMONY	7440-36-0	115	3.1E+01	159	1	1%
ARSENIC	7440-38-2	119	4.3E-01	52	69	58%
BERYLLIUM	7440-41-7	109	1.5E-01	1.7	37	34%
CADMIUM	7440-43-9	129	7.8E+01	2190	3	2%
LEAD	7439-92-1	133	4.0E+02	540	2	2%
THALLIUM	7440-28-0	111	7.8E+00	9.2	1	1%
VOLATILE ORGANIC COMPOUNDS						
DICHLOROETHANE, 1,2-	107-06-2	143	7.0E+00	72	1	1%
OTHER ORGANICS						
BENZO(a)ANTHRACENE	56-55-3	106	8.8E-01	190	7	7%
BENZO(a)PYRENE	50-32-8	106	8.8E-02	150	8	8%
BENZO(b)FLUORANTHENE	205-99-2	106	8.8E-01	150	8	8%
BENZO(k)FLUORANTHENE	207-08-9	106	8.8E+00	41	3	3%
BIS(2-CHLOROETHYL)ETHER	111-44-4	106	5.8E-01	33	2	2%
CHRYSENE	218-01-9	106	8.8E+01	150	1	1%
DIBENZO(a,h)ANTHRACENE	53-70-3	106	8.8E-02	38	4	4%
DICHLOROBENZIDINE, 3,3'-	91-94-1	106	1.4E+00	66	1	1%
DINITRO-2-METHYLPHENOL, 4,6-	534-52-1	106	7.8E+00	170	5	5%
DINITROPHENOL, 2,4-	51-28-5	106	1.6E+02	170	1	1%
HEXACHLOROBENZENE	118-74-1	110	4.0E-01	33	1	1%
INDENO(1,2,3-cd)PYRENE	193-39-5	106	8.8E-01	75	4	4%
NITROSO-di-n-PROPYLAMINE, n-	621-64-7	106	9.1E-02	33	1	1%
PENTACHLOROPHENOL	87-86-5	110	2.7E+00	170	9	8%

Notes:

TAGM 3028: Technical and Guidance Memorandum 3028, Contained in Criteria for Environmental Media (NYSDEC, 1997)
SAL: Soil Action Level

* all inorganic values are reported as total values unless otherwise indicated

TABLE 2
KODAK AREA MIA-301
SUMMARY OF CHEMICAL SCREENING FOR
SOIL CONSTITUENTS EXCEEDING
INDUSTRIAL/COMMERCIAL SOIL RISK-BASED LEVELS

Compound or Substance	CAS Number	Total Number of Samples Submitted for Analysis	I/C RBL Criteria† (mg/kg)	Maximum Concentration of Analyte (mg/kg)	Number of Samples Above I/C RBL Criteria	Percentage of Samples Above I/C RBL Criteria
METALS*						
ARSENIC	7440-38-2	115	3.8E+00	52	28	24%
CADMIUM	7440-43-9	24	1.0E+03	2190	1	4%
LEAD	7439-92-1	26	4.0E+02‡	540	2	8%‡
VOLATILE INORGANIC COMPOUNDS						
DICHLOROETHANE, 1,2-	107-06-2	143	6.3.E+01	72	1	1%
OTHER ORGANICS						
BENZO(a)ANTHRACENE	56-55-3	20	7.8E+00	190	2	10%
BENZO(a)PYRENE	50-32-8	100	7.8E-01	150	7	7%
BENZO(b)FLUORANTHENE	205-99-2	20	7.8E+00	150	3	15%
DIBENZO(a,h)ANTHRACENE	53-70-3	104	7.8E-01	38	3	3%
DINITRO-2-METHYLPHENOL, 4,6-	534-52-1	9	NA	170‡	5‡	56%
INDENO(1,2,3-cd)PYRENE	193-39-5	21	7.8E+00	75	3	14%
PENTACHLOROPHENOL	87-86-5	87	2.4E+01	170	2	2%

Notes:

I/C: Industrial-Commercial
RBL: Risk-Based Level
NA: No I/C RBL could be calculated due to absence of reliable, published toxicological data.

* all inorganic values are reported as total values unless otherwise indicated
† Calculations consistent with U.S. EPA methodology (U.S. EPA, 1996A, B)
‡ Values from previous TAGM 3028 SAL screening step

TABLE 3
KODAK AREA MIA-301
SUMMARY OF CHEMICAL SCREENING FOR GROUNDWATER INORGANIC CONSTITUENTS EXCEEDING TAGM 3028 GROUNDWATER ACTION LEVELS OR TOGS 1.1.1 CRITERIA

			NYSDEC Criteria				
Compound or Substance*	CAS Number	Total Number of Samples Submitted for Analysis	TAGM 3028 GAL (mg/L)	TOGS GA (mg/L)	Maximum Concentration of Analyte (mg/L)	Number of Samples Above Either Criteria	Percentage of Samples Above Either Criteria
ANTIMONY	7440-36-0	87	3.0E-03	3.0E-03	0.135	14	16%
ARSENIC	7440-38-2	95	2.5E-02	2.5E-02	0.095	21	22%
BARIUM	7440-39-3	91	1.0E+00	1.0E+00	4.52	27	30%
BERYLLIUM	7440-41-7	87	4.0E-03	3.0E-03	0.5	1	1%
CADMIUM	7440-43-9	91	5.0E-03	5.0E-03	0.118	12	13%
CHROMIUM	7440-47-3	91	5.0E-02	5.0E-02	0.146	11	12%
COPPER	7440-50-8	91	2.0E-01	2.0E-01	0.485	1	1%
CYANIDE	57-12-5	9	1.0E-01	2.0E-01	0.11	1	11%
IRON	7439-89-6	91	3.0E-01	3.0E-01	180	74	81%
LEAD	7439-92-1	99	1.5E-02	2.5E-02	0.141	21	21%
MAGNESIUM	7439-95-4	91	3.5E+01	3.5E+01	235	35	38%
MANGANESE	7439-96-5	91	3.0E-01	3.0E-01	8.5	50	55%
NICKEL	7440-02-0	91	1.0E-01	1.0E-01	0.217	3	3%
SELENIUM	7782-49-2	95	1.0E-02	1.0E-02	0.22	4	4%
SILVER	7440-22-4	91	5.0E-02	5.0E-02	0.0775	1	1%
SODIUM	7440-23-5	91	2.0E+01	2.0E+01	1620	71	78%
THALLIUM	7440-28-0	99	2.0E-03	5.0E-04	0.09	11	11%
ZINC	7440-66-6	91	3.0E-01	2.0E+00	2.36	8	9%

Notes:

NYSDEC: New York State Department of Environmental Conservation
TAGM 3028: Technical and Guidance Memorandum 3028, Contained in Criteria for Environmental Media (NYSDEC, 1997)
GAL: Groundwater Action Level
TOGS 1.1.1: Division of Water Technical and Operational Series (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (NYSDEC, 1998)
GA: Source of Drinking Water (groundwater)

* all inorganic values are reported as total values unless otherwise indicated

TABLE 4
KODAK AREA MIA-301
SUMMARY OF CHEMICAL SCREENING FOR GROUNDWATER VOLATILE ORGANIC COMPOUND CONSTITUENTS
EXCEEDING TAGM 3028 GROUNDWATER ACTION LEVELS
OR TOGS 1.1.1 CRITERIA

Compound or Substance	CAS Number	Total Number of Samples Submitted for Analysis	NYSDEC Criteria		Maximum Concentration of Analyte (mg/L)	Number of Samples Above Either Criteria	Percentage of Samples Above Either Criteria
			TAGM 3028 GAL (mg/L)	TOGS GA (mg/L)			
ACETONE	67-64-1	169	5.0E-02	5.0E-02	240	39	23%
ACETONITRILE	75-05-8	170	5.0E-02	-	90	6	4%
BENZENE	71-43-2	160	7.0E-04	1.0E-03	10	47	29%
BUTANOL, n-	71-36-3	159	5.0E-02	-	70	5	3%
BUTANONE, 2-	78-93-3	165	5.0E-02	5.0E-02	21	7	4%
CARBON TETRACHLORIDE	56-23-5	155	5.0E-03	5.0E-03	10	5	3%
CHLOROBENZENE	108-90-7	154	5.0E-03	5.0E-03	5	19	12%
CHLOROETHANE	75-00-3	155	5.0E-03	5.0E-03	10	12	8%
CHLOROFORM	67-66-3	159	7.0E-03	7.0E-03	5	20	13%
CYCLOHEXANE	110-82-7	13	5.0E-03	-	0.3	6	46%
DICHLOROETHANE, 1,1-	75-34-3	156	5.0E-03	5.0E-03	6.9	27	17%
DICHLOROETHANE, 1,2-	107-06-2	170	5.0E-03	6.0E-04	73	14	8%
DICHLOROETHENE, 1,2- (total)	540-59-0	156	5.0E-03	5.0E-03	5	3	2%
DICHLOROETHYLENE, 1,1-	75-35-4	158	5.0E-03	5.0E-03	5	15	9%
DICHLOROPROPANE, 1,2-	78-87-5	161	5.0E-03	1.0E-03	13	1	1%
ETHYL ACETATE	141-78-6	166	5.0E-02	-	15	1	1%
ETHYL ALCOHOL	64-17-5	170	5.0E-02	-	120	13	8%
ETHYLBENZENE	100-41-4	161	5.0E-03	5.0E-03	22	48	30%
ETHYLENE GLYCOL	107-21-1	173	5.0E-02	5.0E-02	35000	1	1%
HEPTANE	142-82-5	8	5.0E-02	-	0.4	3	38%
HEXANE	110-54-3	161	5.0E-02	-	10	10	6%
ISOBUTANOL	78-83-1	7	5.0E-02	-	2.3	1	14%
ISOPROPANOL	67-63-0	166	5.0E-02	-	2300	30	18%
ISOPROPYL ETHER	108-20-3	169	5.0E-02	-	430	56	33%
METHYL ALCOHOL	67-56-1	170	5.0E-02	-	2800	14	8%
METHYL-2-PENTANONE, 4-	108-10-1	159	5.0E-02	-	10	2	1%
METHYLENE CHLORIDE	75-09-2	168	5.0E-03	5.0E-03	348.8	17	10%
PYRIDINE	110-86-1	7	5.0E-02	5.0E-02	0.25	3	43%
STYRENE	100-42-5	162	5.0E-03	5.0E-03	15	1	1%
TETRACHLOROETHYLENE	127-18-4	156	5.0E-03	5.0E-03	5	3	2%
TETRAHYDROFURAN	109-99-9	169	5.0E-02	5.0E-02	10	20	12%
TOLUENE	108-88-3	171	5.0E-03	5.0E-03	79.305	40	23%
TRICHLOROETHANE, 1,1,1-	71-55-6	156	5.0E-03	5.0E-03	17	18	12%
TRICHLOROETHANE, 1,1,2-	79-00-5	156	5.0E-03	1.0E-03	5	3	2%
TRICHLOROETHYLENE	79-01-6	160	5.0E-03	5.0E-03	5	17	11%
VINYL CHLORIDE	75-01-4	157	2.0E-03	2.0E-03	10	10	6%
XYLENE (total)	1330-20-7	166	5.0E-03	5.0E-03	69	58	35%

Notes:

NYSDEC: New York State Department of Environmental Conservation
TAGM 3028: Technical and Guidance Memorandum 3028, Contained in Criteria for Environmental Media (NYSDEC, 1997)
GAL: Groundwater Action Level
TOGS 1.1.1: Division of Water Technical and Operational Series (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (NYSDEC, 1998)
GA: Source of Drinking Water (groundwater)
-: No value

TABLE 5
KODAK AREA MIA-301
SUMMARY OF CHEMICAL SCREENING FOR OTHER GROUNDWATER ORGANIC CONSTITUENTS
EXCEEDING TAGM 3028 GROUNDWATER ACTION LEVELS
OR TOGS 1.1.1 CRITERIA

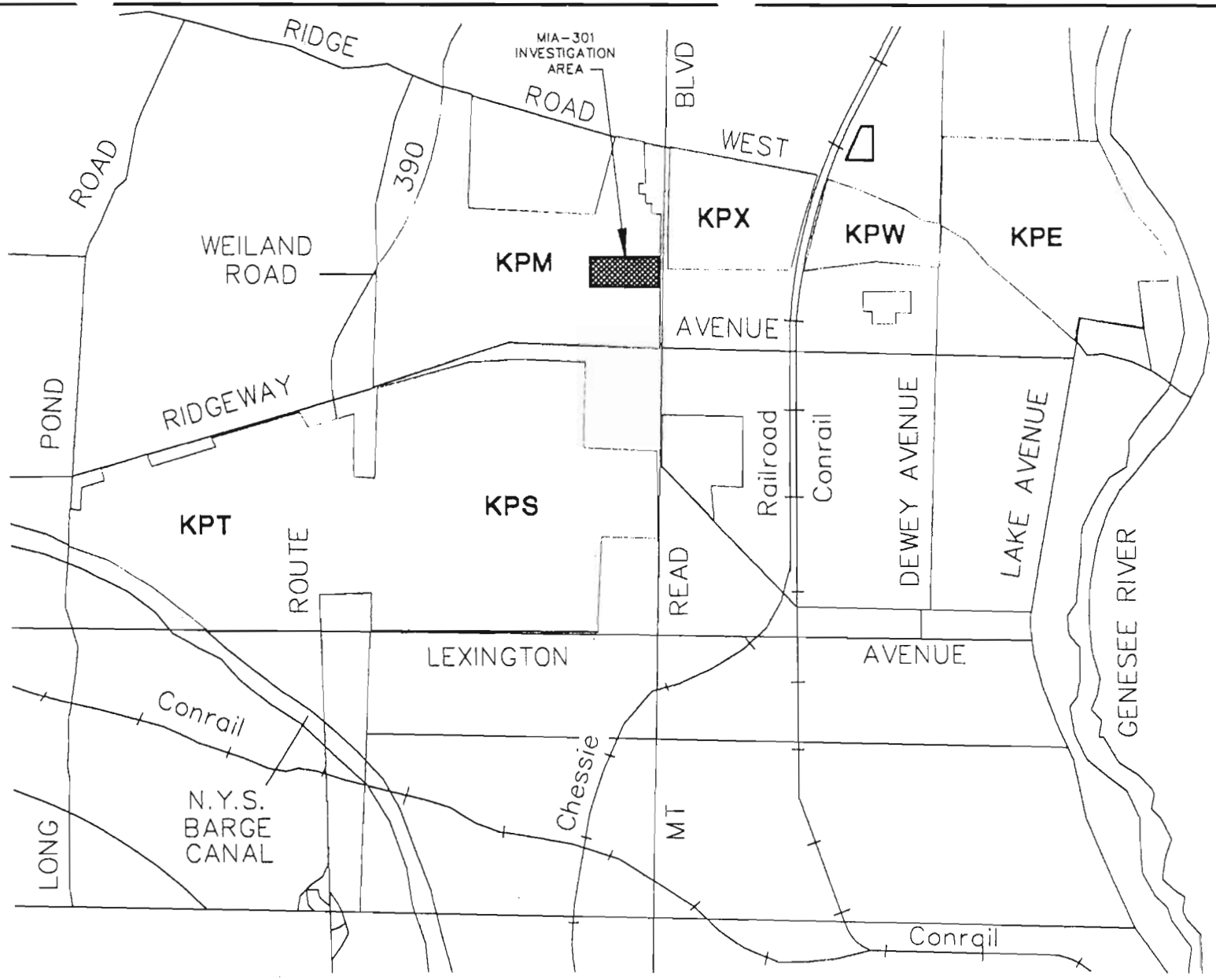
Compound or Substance	CAS Number	Total Number of Samples Submitted for Analysis	NYSDEC Criteria		Maximum Concentration of Analyte (mg/L)	Number of Samples Above Either Criteria	Percentage of Samples Above Either Criteria
			TAGM 3028 GAL (mg/L)	TOGS GA (mg/L)			
BENZOIC ACID	65-85-0	108	5.0E-02	-	2.5	6	6%
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	109	5.0E-03	5.0E-03	2	5	5%
CHLOROANILINE, 4-	106-47-8	109	5.0E-03	5.0E-03	2	4	4%
DICHLOROBENZENE, 1,2-	95-50-1	109	4.7E-03	3.0E-03	2	9	8%
DICHLOROBENZENE, 1,4-	106-46-7	109	4.7E-03	3.0E-03	2	4	4%
DIOXANE, 1,4-	123-91-1	173	5.0E-02	-	5.8	56	32%
METHYL ACETATE	79-20-9	153	5.0E-02	-	25	2	1%
NAPHTHALENE	91-20-3	109	1.0E-02	1.0E-02	2	2	2%
NITROBENZENE	98-95-3	109	5.0E-03	4.0E-04	2	3	3%
CRESOL, p-	106-44-5	22	†	†	31	5	23%
DICHLOROPHENOL, 2,4-	120-83-2	109	†	†	0.035	2	2%
DIMETHYLPHENOL, 2,4-	105-67-9	109	†	†	0.18	18	17%
METHYLPHENOL, 2-	95-48-7	109	†	†	0.15	4	4%
METHYLPHENOL, 3 & 4-	1319-77-3	40	†	†	0.37	5	13%
PHENOL	108-95-2	109	†	†	0.049	3	3%
TOTAL PHENOLS	NA	109	1.0E-03†	1.0E-03†	31††	26	24%

Notes:

NA: Not Applicable
NYSDEC: New York State Department of Environmental Conservation
TAGM 3028: Technical and Guidance Memorandum 3028, Contained in Criteria for Environmental Media (NYSDEC, 1997)
GAL: Groundwater Action Level
TOGS 1.1.1: Division of Water Technical and Operational Series (1.1.1), Ambient Water Quality Standards and Guidance Guidance Values and Groundwater Effluent Limitations (NYSDEC, 1998)
GA: Source of Drinking Water (groundwater)

† total phenolic compounds not to exceed 1.0×10^{-3} mg/L
†† highest individual phenolic compound concentration

In determining the number of samples above the total phenolic criteria, any concentration above 1.0×10^{-3} mg/L was retained. All retained phenolics and concentrations considered were above this criteria.



NOTE:
SHADED AREAS DENOTE KODAK
PARK FACILITY

CLIENT/PROJECT

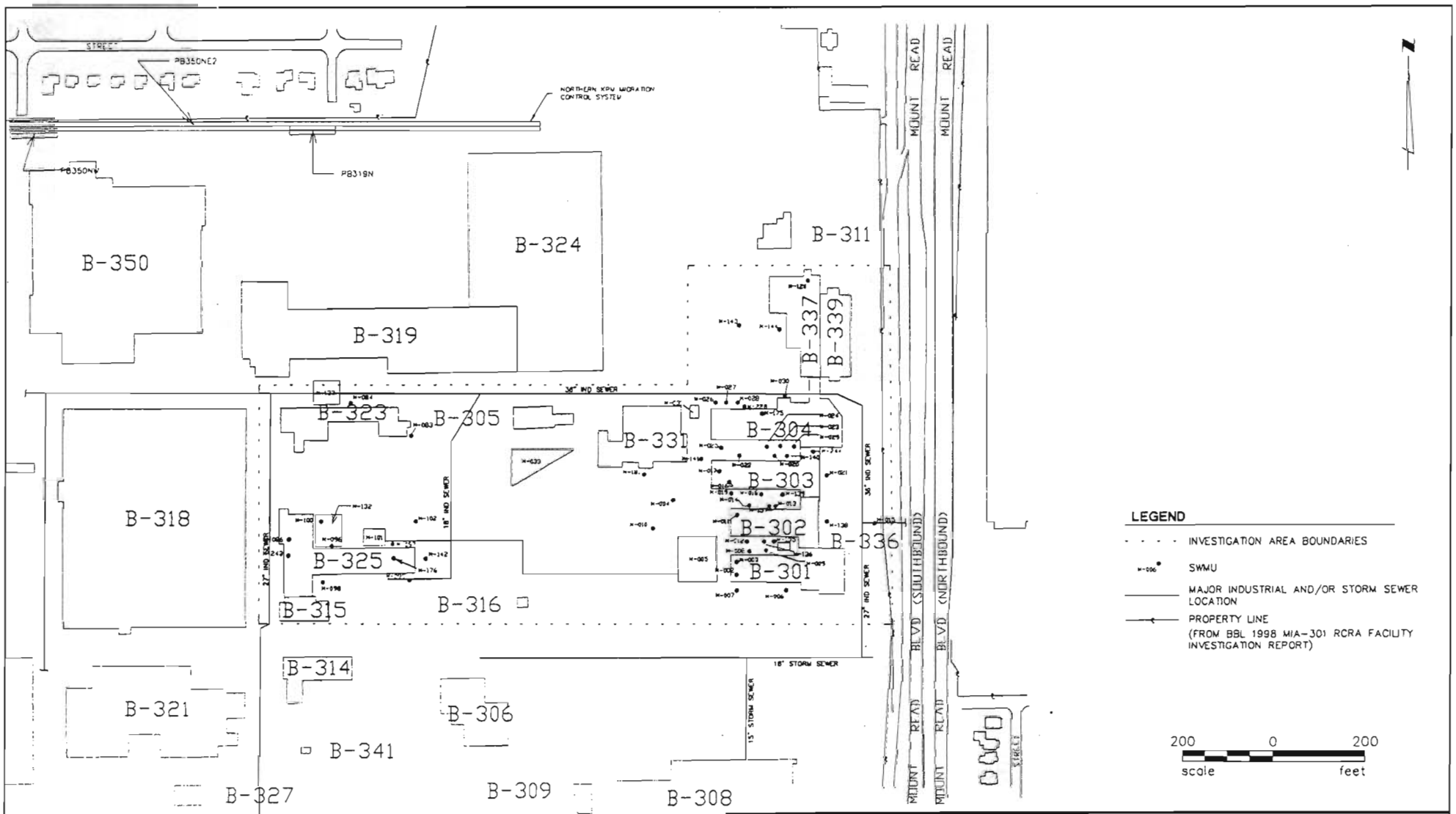
EASTMAN KODAK COMPANY
KODAK PARK HSE DIVISION
GROUNDWATER QUALITY SECTION

Golder Associates Buffalo, New York

TITLE

MIA-301
CORRECTIVE MEASURES STUDY
SITE LOCATION MAP

DRAWN	CHECKED	REVIEWED	DATE	SCALE	FILE NO.	JOB NO.	DWG NO.	FIGURE
BEC	DJM	DJM	1/18/00	NA	993-9216	993-9216	KOD044	1

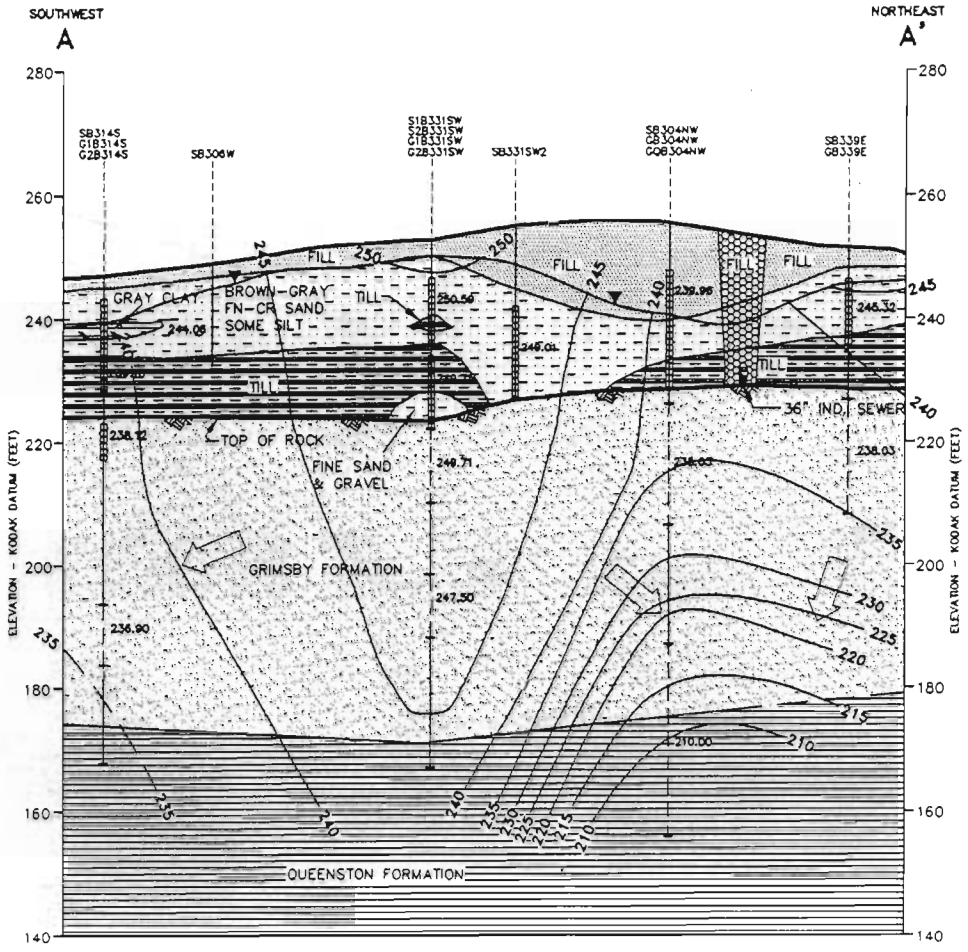


Golder Associates — Buffalo, New York

CLIENT/PROJECT: MIA-301 CORRECTIVE MEASURES STUDY
KODAK PARK CORRECTIVE ACTION PROGRAM
EASTMAN KODAK COMPANY
ROCHESTER, NEW YORK

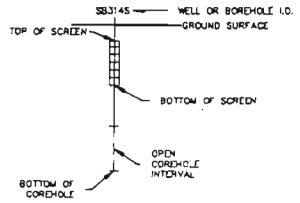
TITLE: INVESTIGATION AREA LOCATION MAP

DRAWN: LPG	DATE: 1/21/00	JOB NO.: 993-9216
CHECKED: DCW	SCALE: AS SHOWN	DWG. NO.: KOD-061
REVIEWED: DJM	FILE NO.: 993-9216	FIGURE NO.: 2

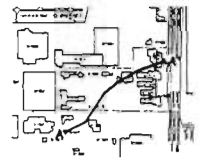


LEGEND

- 280 — GROUNDWATER ELEVATION IN FEET (KODAK DATUM)
- 238.03 GROUNDWATER ELEVATION IN FEET (KODAK DATUM)
- WATER TABLE
- GROUNDWATER FLOW DIRECTION
- FILL MATERIAL
- SAND AND SILT (LACUSTRINE)
- SILT AND CLAY (LACUSTRINE)
- GLACIAL TILL
- SANDSTONE
- SHALE



CROSS-SECTION LOCATION



(FROM BBL 1998 MIA-301 RCRA FACILITY INVESTIGATION REPORT)

200 0 200
scale feet

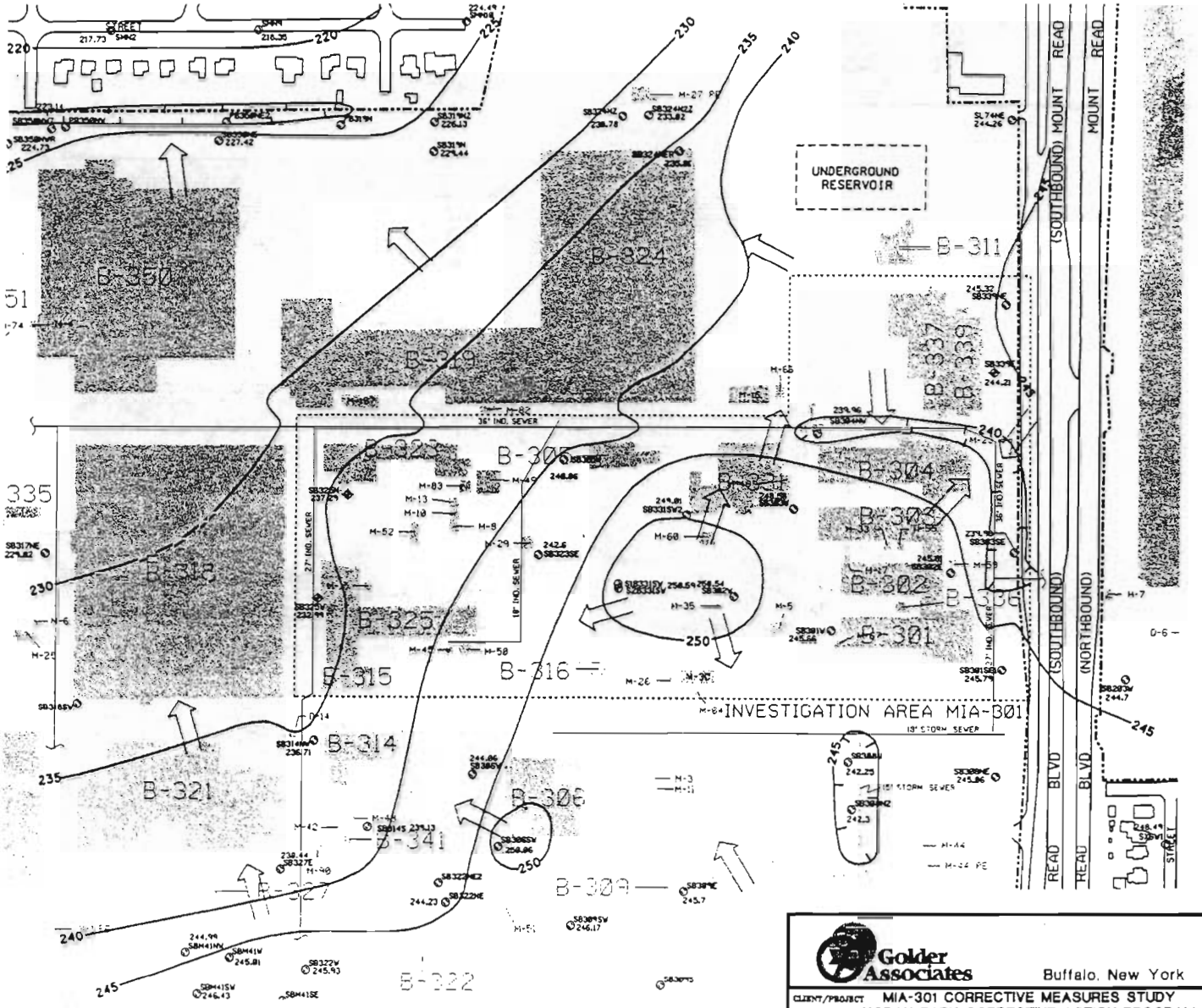
VERTICAL EXAGGERATION 10:1

Golder Associates Buffalo, New York

CLIENT/PROJECT: MIA-301 CORRECTIVE MEASURES STUDY
KODAK PARK CORRECTIVE ACTION PROGRAM
EASTMAN KODAK COMPANY
ROCHESTER, NEW YORK

TITLE: GEOLOGIC CROSS-SECTION OF MIA-301

DRAWN	LPG	DATE	1/21/00	JOB NO.	993-9216
CHECKED	DCW	SCALE	AS SHOWN	DWG. NO.	KOD-062
REVIEWED	DJM	FILE NO.	993-9216	FIGURE NO.	3



LEGEND

- INVESTIGATION AREA BOUNDARIES
- EXISTING MONITORING WELL
- NEW GROUNDWATER MONITORING WELL
- MAJOR INDUSTRIAL AND/OR STORM SEWER LOCATION
- 245.84 OVERBURDEN GROUNDWATER POTENTIOMETRIC ELEVATION (FEET)
- 235 OVERBURDEN GROUNDWATER POTENTIOMETRIC CONTOURS (FEET)
- HORIZONTAL COMPONENT OF GROUNDWATER FLOW DIRECTION (FROM BBL 1998 MIA-301 RCRA FACILITY INVESTIGATION REPORT)

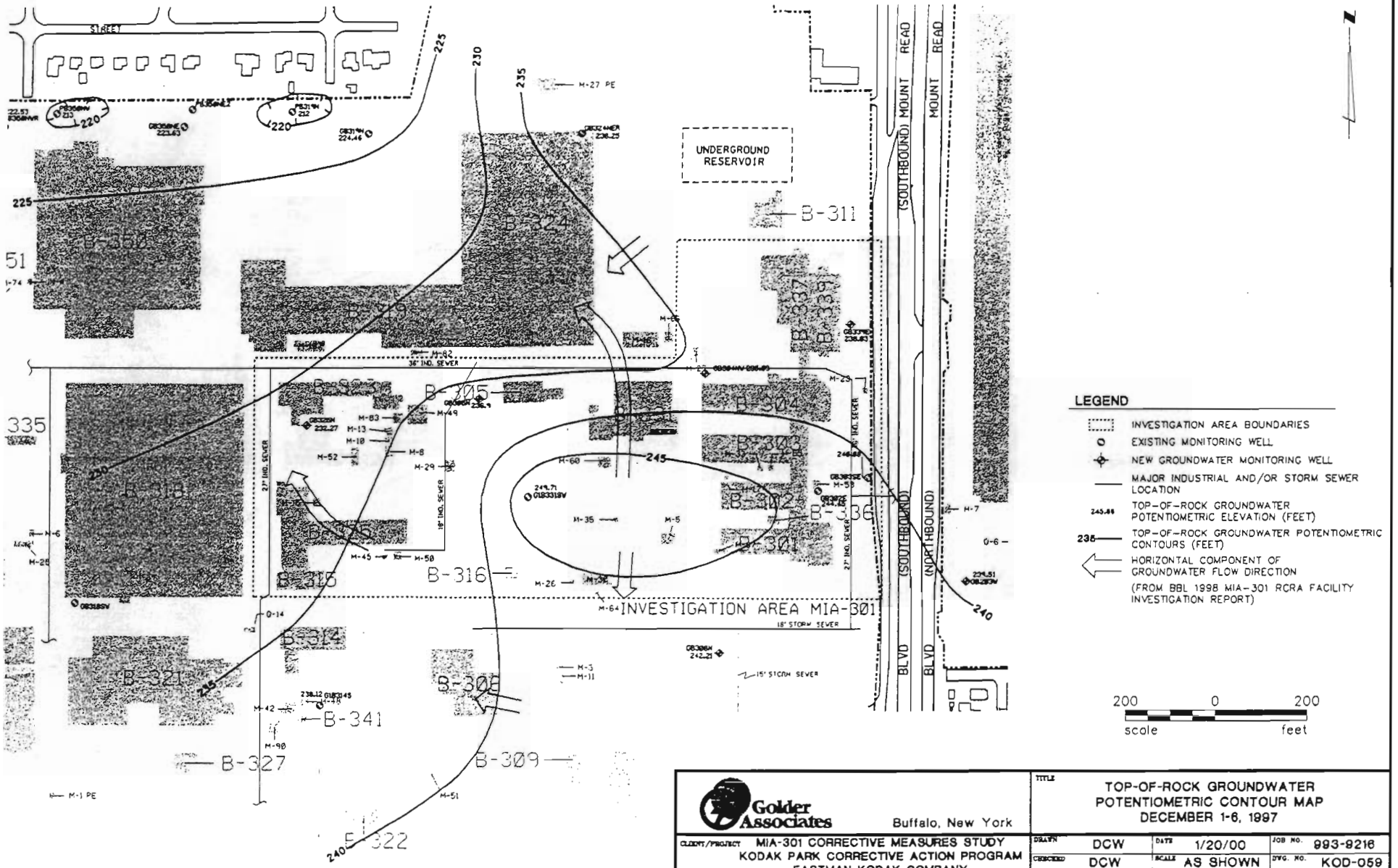
200 0 200
scale feet

Golder Associates — Buffalo, New York

CLIENT/PROJECT: MIA-301 CORRECTIVE MEASURES STUDY
KODAK PARK CORRECTIVE ACTION PROGRAM
EASTMAN KODAK COMPANY
ROCHESTER, NEW YORK

TITLE: OVERBURDEN GROUNDWATER CONTOUR MAP DECEMBER 1-6, 1997

DRAWN: DCW	DATE: 1/20/00	JOB NO.: 993-9216	
CHECKED: DCW	SCALE: AS SHOWN	DWG. NO.: KOD-058	
REVIEWED: DJM	FILE NO.: 993-9216	FIGURE NO.: 4	

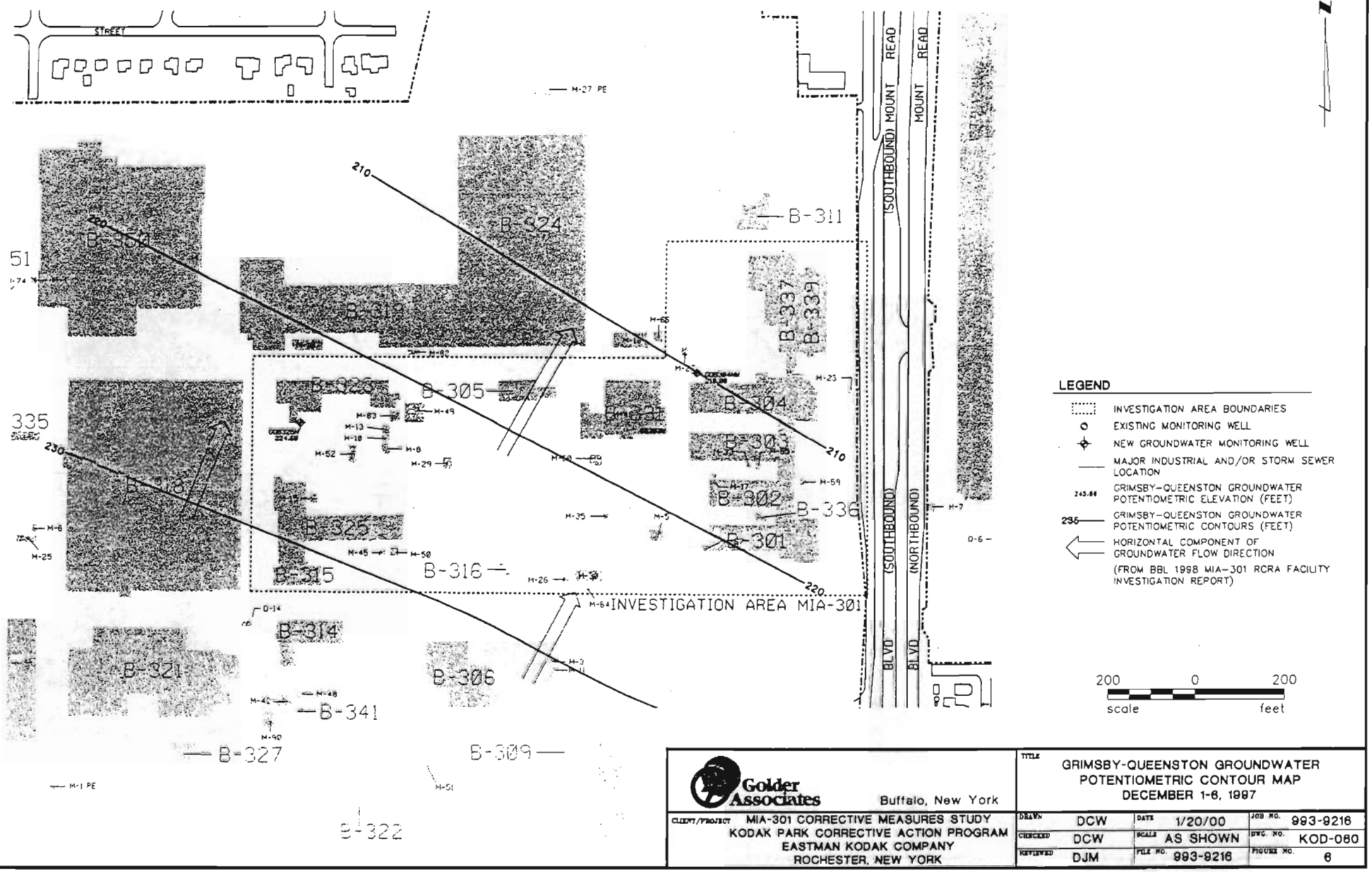


Golder Associates — Buffalo, New York

CLIENT/PROJECT: MIA-301 CORRECTIVE MEASURES STUDY
KODAK PARK CORRECTIVE ACTION PROGRAM
EASTMAN KODAK COMPANY
ROCHESTER, NEW YORK

TITLE: TOP-OF-ROCK GROUNDWATER POTENTIOMETRIC CONTOUR MAP DECEMBER 1-6, 1997

DRAWN: DCW	DATE: 1/20/00	JOB NO.: 993-9216
CHECKED: DCW	SCALE: AS SHOWN	DWG. NO.: KOD-059
REVIEWED: DJM	FILE NO.: 993-9216	FIGURE NO.: 5

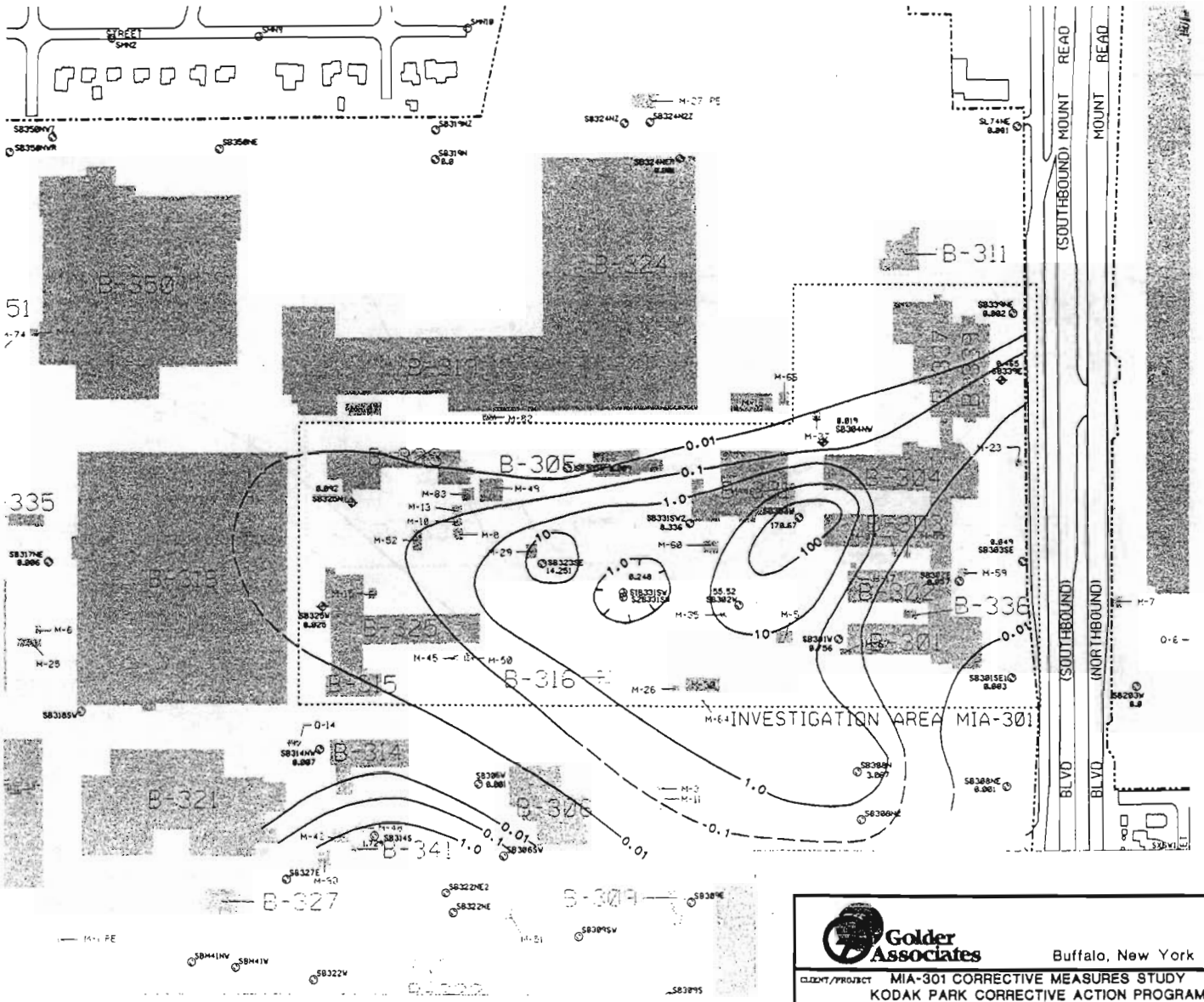


Golder Associates — Buffalo, New York

CLIENT/PROJECT: MIA-301 CORRECTIVE MEASURES STUDY
KODAK PARK CORRECTIVE ACTION PROGRAM
EASTMAN KODAK COMPANY
ROCHESTER, NEW YORK

TITLE: GRIMSBY-QUEENSTON GROUNDWATER POTENTIOMETRIC CONTOUR MAP
DECEMBER 1-6, 1997

DRAWN	DCW	DATE	1/20/00	JOB NO.	993-9216
CHECKED	DCW	SCALE	AS SHOWN	DWG. NO.	KOD-060
REVIEWED	DJM	FILE NO.	993-9216	FIGURE NO.	6



N

LEGEND

- INVESTIGATION AREA BOUNDARIES
- EXISTING MONITORING WELL
- NEW GROUNDWATER MONITORING WELL
- 0.016 — OVERBURDEN GROUNDWATER TOTAL VOC CONCENTRATIONS (mg/L)
- 0.1 — OVERBURDEN GROUNDWATER TOTAL VOC CONCENTRATIONS CONTOUR (mg/L) (FROM BBL 1998 MIA-301 RCRA FACILITY INVESTIGATION REPORT)

200 0 200
scale feet

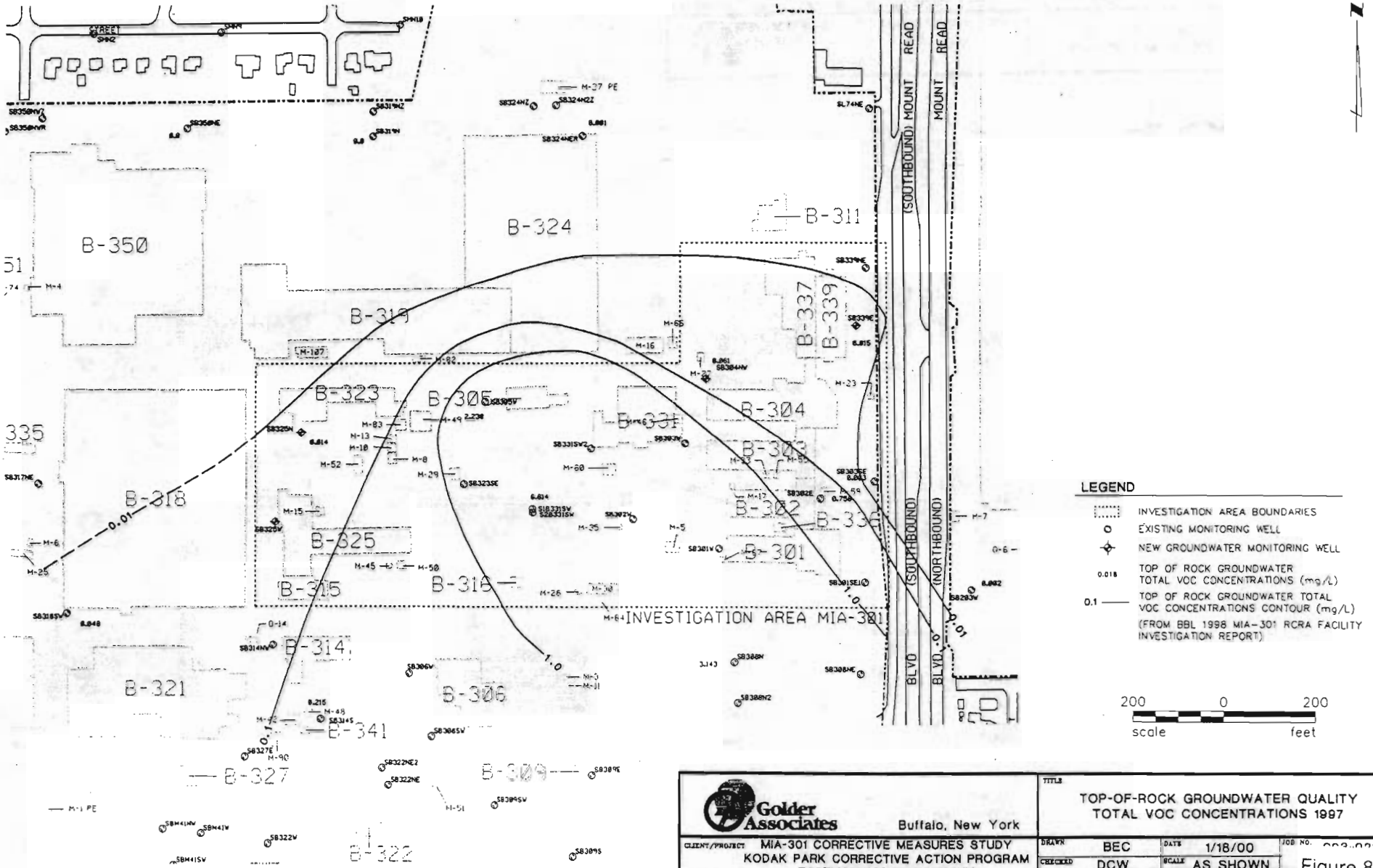
Golder Associates — Buffalo, New York

CLIENT/PROJECT: MIA-301 CORRECTIVE MEASURES STUDY
KODAK PARK CORRECTIVE ACTION PROGRAM
EASTMAN KODAK COMPANY
ROCHESTER, NEW YORK

TITLE: OVERBURDEN GROUNDWATER QUALITY TOTAL VOC CONCENTRATIONS 1997

DRAWN	BEC	DATE	1/18/00
CHECKED	DCW	SCALE	AS SHOWN
REVIEWED	DJM	FILE NO.	993-9216

Figure 7



Golder Associates Buffalo, New York

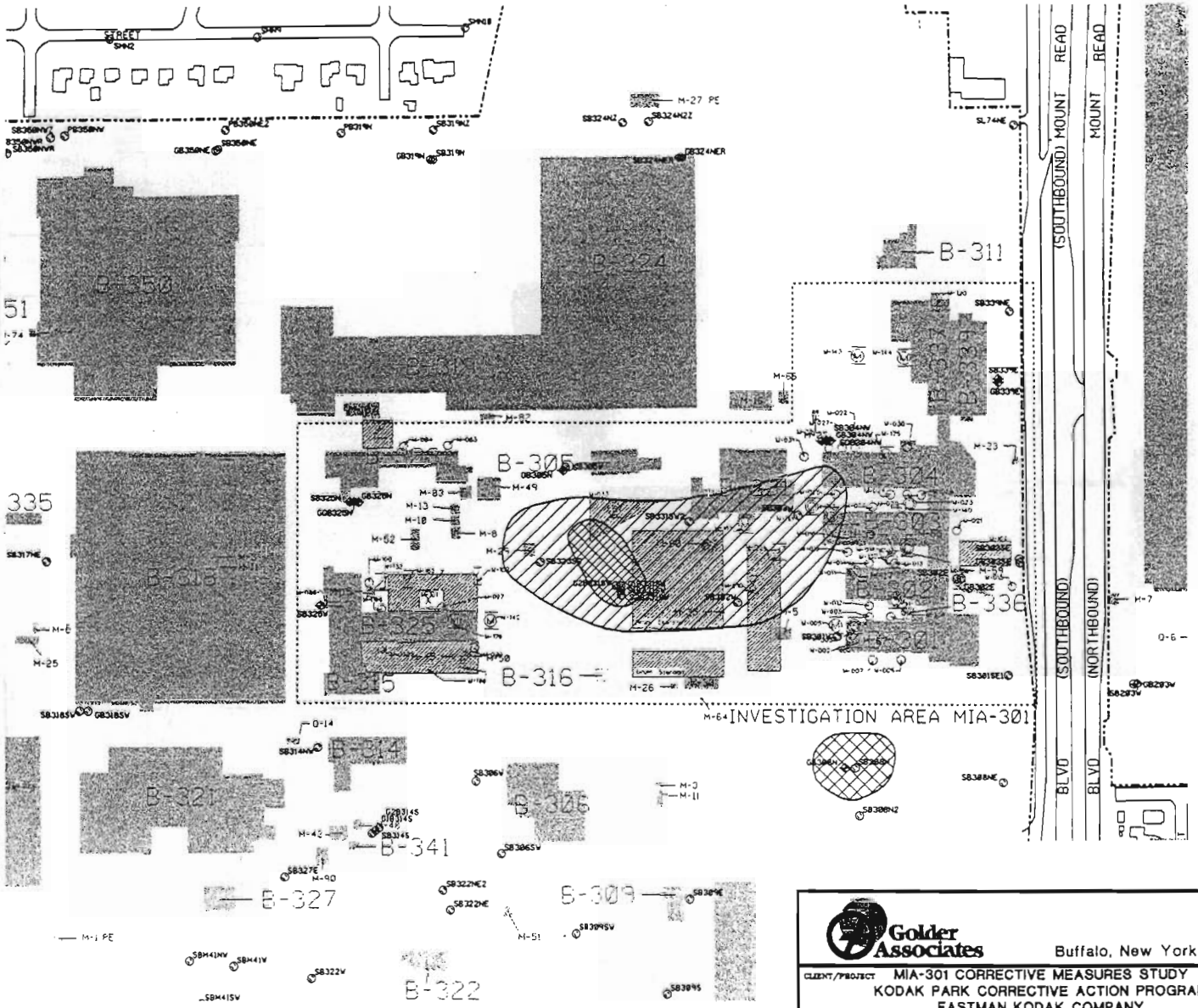
CLIENT/PROJECT: MIA-301 CORRECTIVE MEASURES STUDY
KODAK PARK CORRECTIVE ACTION PROGRAM
EASTMAN KODAK COMPANY
ROCHESTER, NEW YORK

TITLE: TOP-OF-ROCK GROUNDWATER QUALITY TOTAL VOC CONCENTRATIONS 1997

DRAWN	BEC	DATE	1/18/00
CHECKED	DCW	SCALE	AS SHOWN
REVIEWED	DJM	FILE NO.	993-9216

JOB NO. 993-9216

Figure 8



Golder Associates — Buffalo, New York

TITLE: POTENTIAL NAPL ZONES

CLIENT/PROJECT: MIA-301 CORRECTIVE MEASURES STUDY
KODAK PARK CORRECTIVE ACTION PROGRAM
EASTMAN KODAK COMPANY
ROCHESTER, NEW YORK

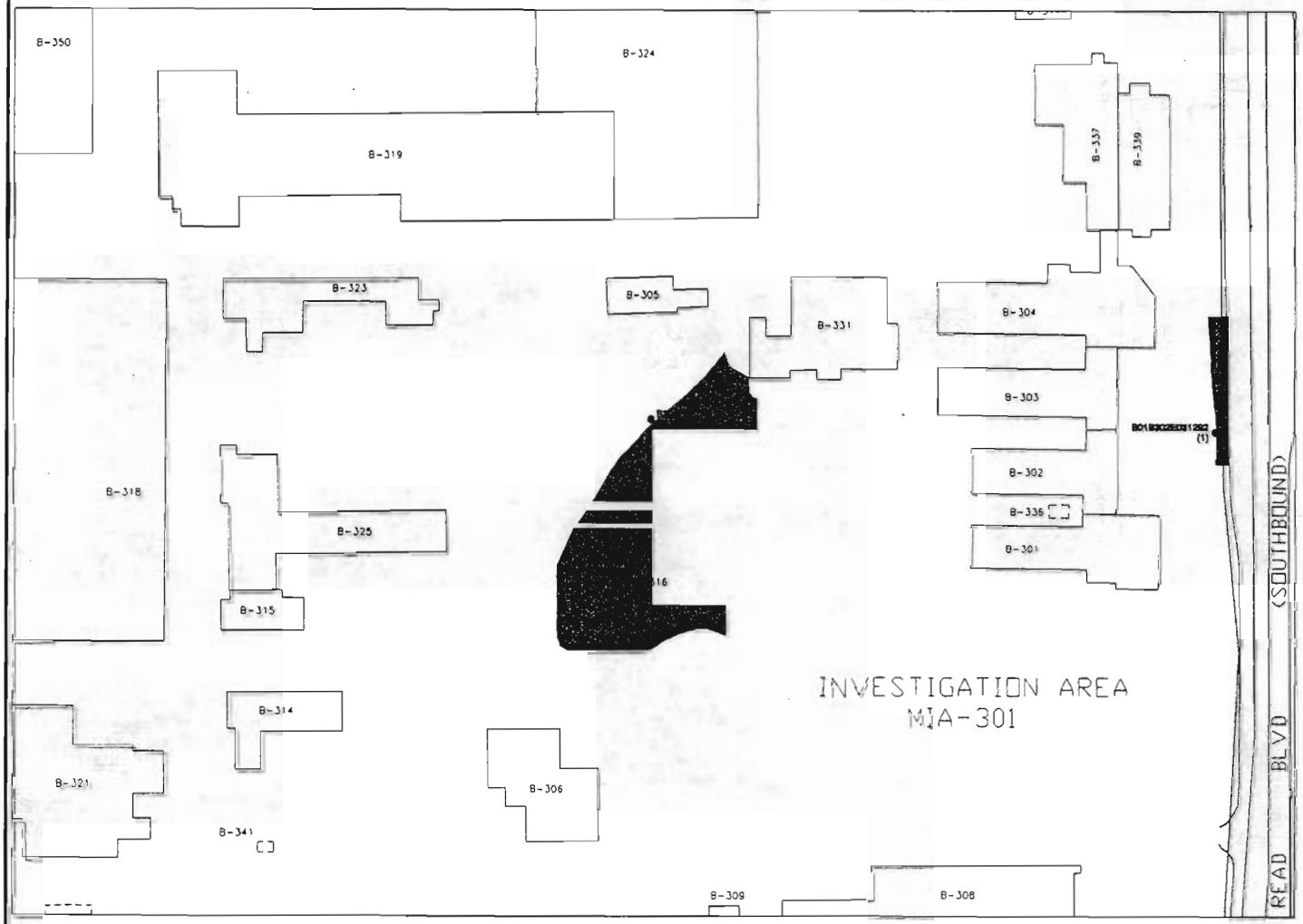
DRAWN	BEC	DATE	1/18/00
CHECKED	DCW	SCALE	AS SHOWN
REVIEWED	DJM	FILE NO.	993-9216

JOB NO.

Figure 9

POTENTIAL AREAS FOR PROTECTIVE COVERING IN MIA-301
WHERE SUBSTANCES IN SOIL EXCEEDED
INDUSTRIAL/COMMERCIAL RISK-BASED LEVELS
AND NOT ELIMINATED BY INSTITUTIONAL CONTROLS

Figure 10



LEGEND:

- SOIL SAMPLING LOCATIONS INDICATES THE NUMBER OF "DETECTED" METAL EXCEEDENCES BASED ON INDUSTRIAL/COMMERCIAL RISK BASED LEVEL.
- AREAS OF EXPOSED SOILS, POTENTIALLY SUBJECT TO COVERING (APPROXIMATE LOCATIONS BASED ON AERIAL PHOTOGRAPHS)

SCALE: 1" = 150'
0 100 200 300 400

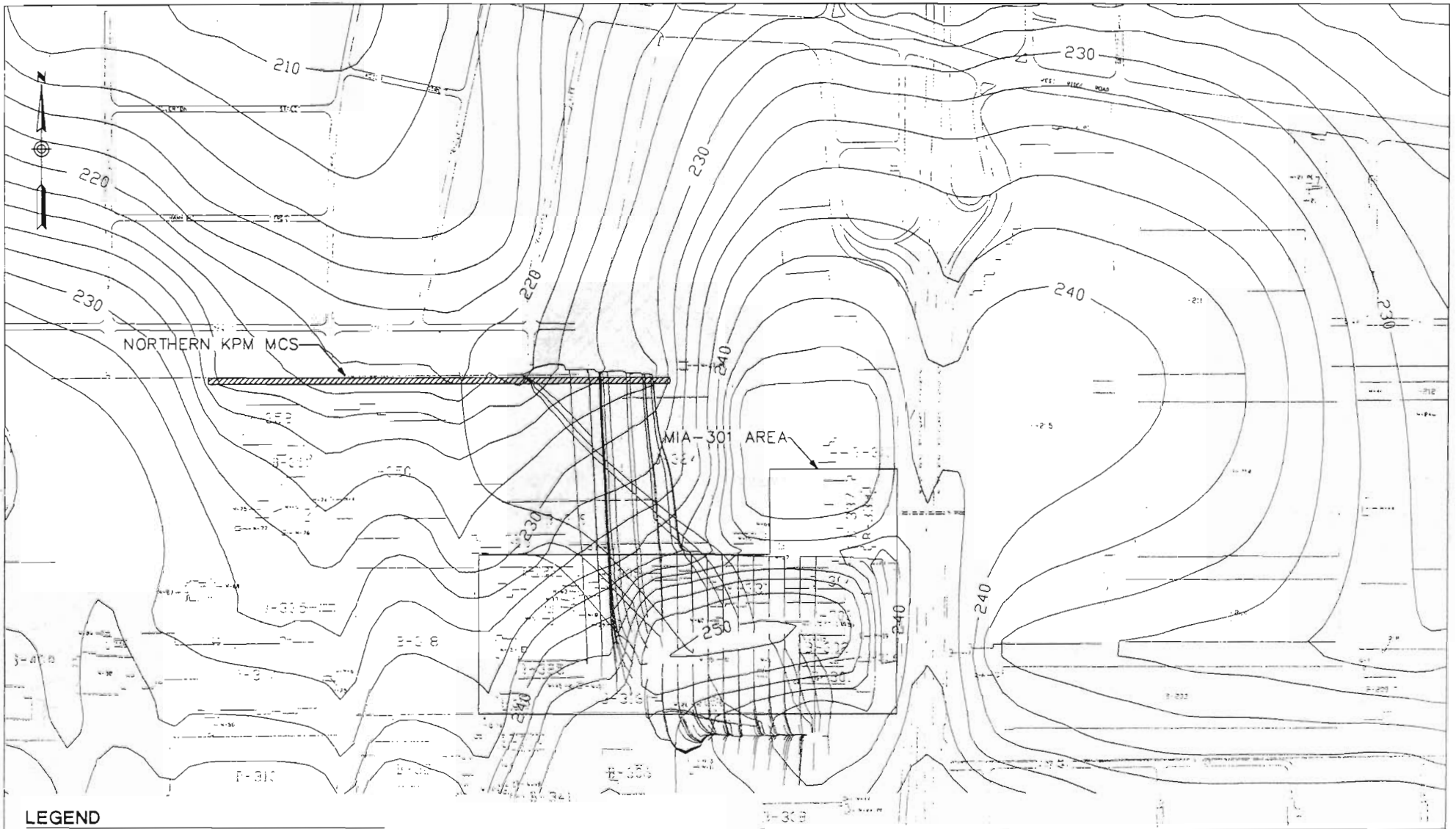
Date JAN 2000 Drawn LG

Buffalo Project 993-9216 Mississauga Project 991-1385

Golder Associates

Chkd BCS

013850111.DWG



LEGEND

- SIMULATED GROUNDWATER CONTOURS
- 250 SIMULATED GROUNDWATER ELEVATION (FT MSL)
- SIMULATED PARTICLE PATHLINES

COMPUTER RUN: KODAK.DEF

300 0 300
scale feet

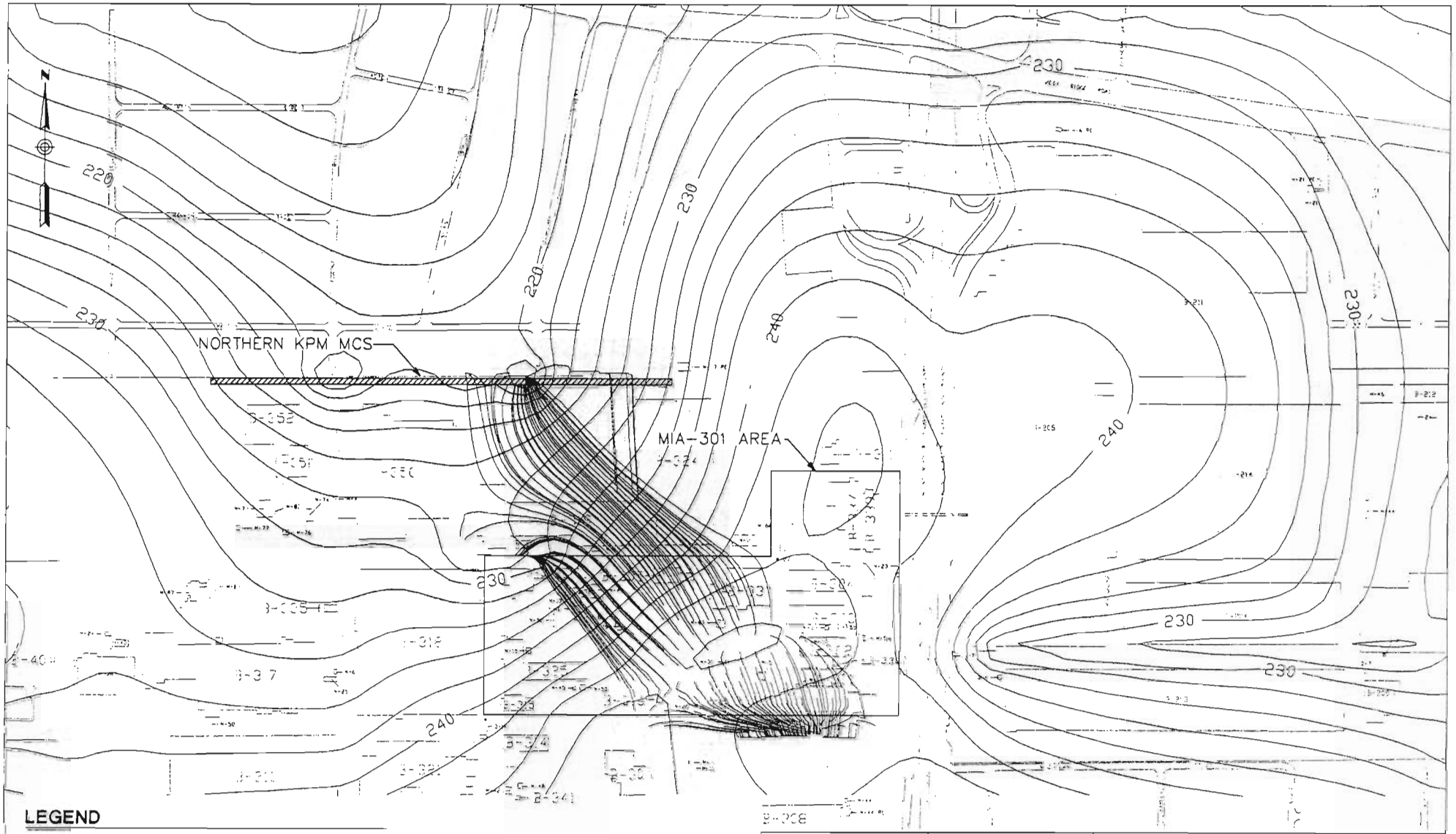
JOB No.:	993-9216	SCALE:	AS SHOWN
DR BY:	DSL	DATE:	01/26/00
CHK BY:	BCS	FILE No.:	NY02-469
REV BY:		DR SUBTITLE:	01

Golder Associates

SIMULATED GROUNDWATER CONTOURS AND PARTICLE PATHLINES OVERBURDEN - EXISTING CONDITIONS

EASTMAN KODAK COMPANY

Figure 11



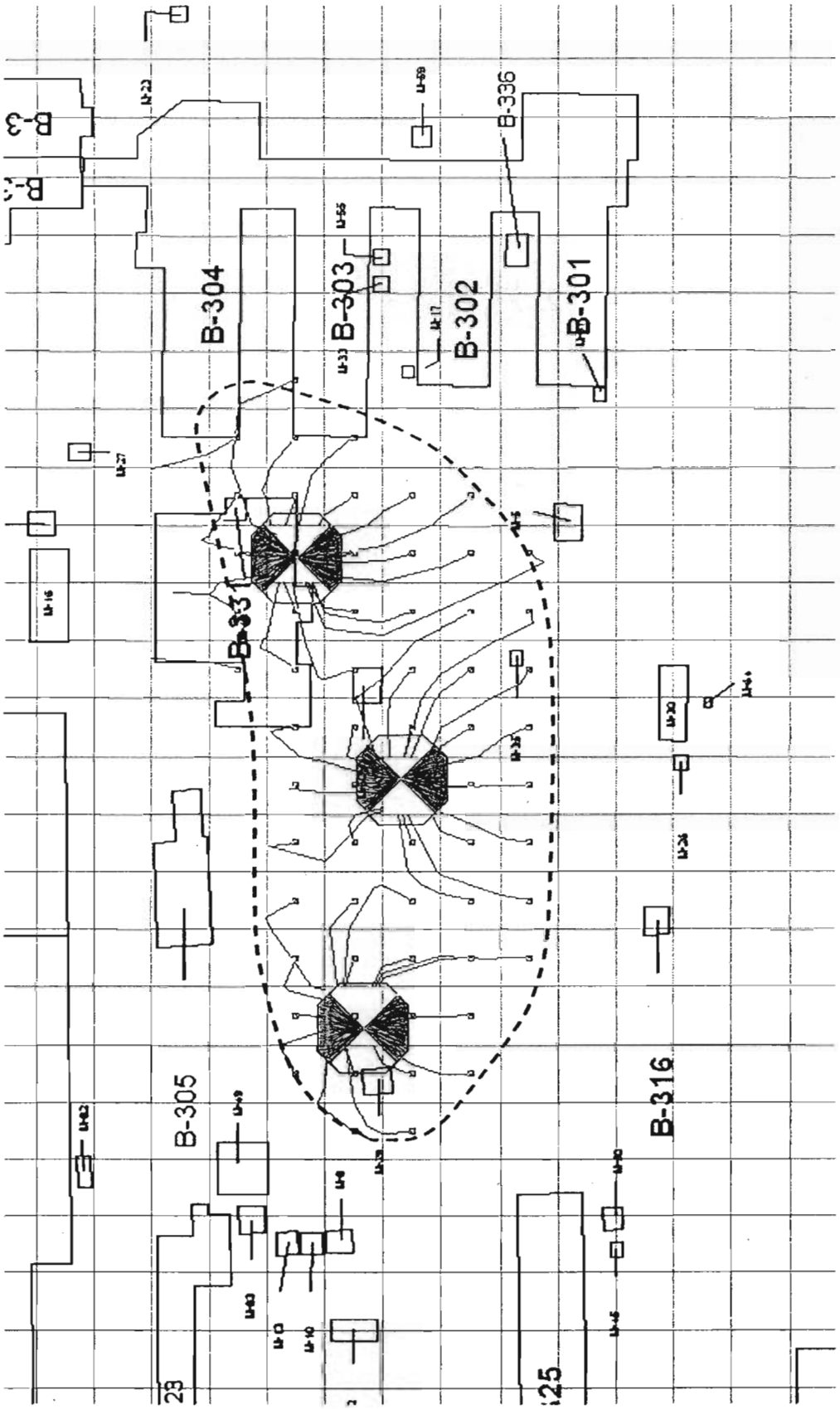
JOB No.:	993-9216	SCALE:	AS SHOWN
DR BY:	DSL	DATE:	01/26/00
CHK BY:		FILE No.:	NY02-470
REV BY:	BCS	DR SUBTITLE:	01

Golder Associates

SIMULATED GROUNDWATER CONTOURS AND PARTICLE PATHLINES TOR - EXISTING CONDITIONS

EASTMAN KODAK COMPANY

Figure 12



JOB No.:	033-9345	SCALE:	N/A
DR BY:	ACK	DATE:	3/26/03
CHK BY:	ACK	FILE No.:	Figure3 final0326.doc
REV BY:	MW for BCS	DIRECTORY:	G:\0339345\

MIA-301, Overburden Layer, Capture of Particles within Inferred NAPL Zone with Modeled Pumping Wells

Golder Associates

Eastman Kodak Company

FIGURE: 13