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February 24, 1997
Project 85740-000.000

Jaspal Walia, P.E.
New York State Department of
Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203-2999

Re: Revised Site Investigation Report
Former GM-Saginaw Facility, Buffalo, NY
NYSDEC Site No. 915152

Dear Mr. Walia:

On January 10, 1997, Wehran-New York, Inc. (EMCON) submitted four (4) copies of the Site Investigation ("SI") Report for the referenced site. This was the report required under I (B)(1)(a) - Operable Unit No. 1 and I (B)(2)(b) - Operable Unit No. 2 of the Consent Order. This Report updated the version submitted October 11, 1995. It reflected revisions prompted by the Department's December 27, 1995 comment letter on the earlier version of the SI Report and incorporated the results of the supplemental work tasks which were requested by the Department.

Enclosed is the recently completed data validation report for the congener specific PCB analysis performed on soil sample MW-207S3 and aqueous sample MW-207. Please insert the report at the front of Appendix F in Volume II. Please note that all items were found to be compliant and that consequently the data which was utilized in the report, is acceptable.

Following the Department's approval of the SI Report, we will proceed with the preparation of the Engineering Evaluation of Alternatives Report for Operable Units No. 1 and No. 2 (Consent Order I (B)(1)(b) and I (B)(2)(c)). The Report shall be submitted to the Department within thirty (30) days after GM's receipt of the Department's written approval of the SI Report.

Please contact me if you have any questions on the enclosed.

Sincerely,

EMCON

Kenneth C. Malinowski, Ph.D.
Project Manager

Attachments
cc: M. Napolitan - GM
J. Braun - GM Legal
B. Kogut - Bond, Schoeneck & King, LLP
J. Hazel - NYSDEC
NYSDOH - Albany (2)
NYSDEC Albany

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Re: Revised Site Investigation Report
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Dear Mr. Walia:

On behalf of General Motors Corporation, Wehran-New York, Inc. (EMCON) is pleased to submit four (4) copies of the Site Investigation ("SI") Report for the referenced site. This is the report required under I (B)(1)(a) - Operable Unit No. 1 and I (B)(2)(b) - Operable Unit No. 2 of the Consent Order. The Report has been updated from the version submitted under cover of our letter dated October 11, 1995. It reflects revisions prompted by the Department's December 27, 1995 comment letter on the earlier version of the SI Report and incorporates the results of the supplemental work tasks which were requested by the Department.

Volume I of the January Site Investigation Report completely replaces the previously submitted Volume I. Please discard the previous Volume I. Since the majority of the Appendices remain unchanged, only updates to Volume II have been provided. Please replace the previous binder cover with the revised one and insert the additional pages as indicated on the cover sheets for each Appendix addition. Also enclosed is a copy of an Addendum which sets forth GM's response to the specific comments raised by the Department in its December 27, 1995 comment letter.

One of the deliverables reference under I (B)(2)(a) of the Consent Order, the Technical Memorandum for Operable Unit No. 2 (Site History Report dated March, 1995) was included in the previously submitted SI Report as Appendix A. The Site History Report documents the past use by the City of Buffalo of portions of the Site as an ash landfill. The current owner of the Site, American Axle & Manufacturing ("AAM"), will be providing a copy of the SI Report to the City of Buffalo in connection with the possible construction by the City of a municipal storm sewer system at the Site.

Following the Department's approval of the SI Report, we will proceed with the preparation of the Engineering Evaluation of Alternatives Report for Operable Units No. 1 and No. 2 (Consent Order I (B)(1)(b) and I (B)(2)(c)). The Report shall be submitted to the Department within thirty (30) days after GM's receipt of the Department's written approval of the SI Report.

Please contact us if you have any questions on the enclosed SI Report.

Sincerely,

EMCON

Ken Malinowski

Kenneth C. Malinowski, Ph.D.
Project Manager

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NYSDEC Albany

ADDENDUM

Responses to NYSDEC Comment Letter of December 27, 1995 in response to the October 1995 Site Investigation Report for the former GM-Saginaw Division Facility in Buffalo, New York (NYSDEC Site No. 915152).

(1) General Comment 1

Completed through Supplemental Site Investigation (SSI) program.

(2) General Comment 2

Completed through Supplemental Site Investigation (SSI) program.

(3) General Comment 3

As stated on page 2-3 of the NYSDEC approved PCB and Lead Work Plan, dated June 1994 and revised November 1994, *"GM intends to perform the source removal IRM using 50 ppm as a guide to assess the limits of excavation beyond the 3 foot wide by 100 foot long planned excavation. Therefore, if a sample of soil/fill exhibits a concentration greater than 50 ppm, then an additional foot will be removed from the sidewall. However, if the concentration remains greater than 50 ppm, then it will be GM's decision whether or not to proceed with the excavation any further.* ***This will only apply to the unsaturated portion of the soils. The saturated soils will only be excavated as a consequence of pipe removal, as the existing groundwater collection trench will provide collection of the free-product oil and groundwater."***

Only two of the six samples collected from the sidewalls of the Source Removal IRM excavation exhibited PCB concentrations greater than 50 ppm (NWT-C3 and SET-E3). Both of these samples were collected from depths below 5 feet below ground surface (5.25 ft. and 5 to 7 ft., respectively). The water table was observed to be at 4 to 4.5 feet below ground surface. These two samples were obtained from the saturated zone. As a result, the cleanup criteria for the Source Removal IRM were met in accordance with the Work Plan. Hence, the IRM as detailed in the Work Plan is complete.

The completion of the Source Removal IRM was only the first task designed to address the PCB contamination in Operable Unit No. 1; it was not intended to be the complete remedial response. Under Task 6 of Operable Unit No. 1, entitled *Engineering Evaluation of Alternatives*, a range of remedial alternatives for soil and groundwater will be evaluated and the engineering evaluation report will be submitted following NYSDEC's written approval of the Site Investigation ("SI") Report. The foregoing is reflected in the text of the SI Report.

(4) General Comment 4

The May 8, 1995 letter from Mr. Walia to Mr. Malinowski refers to a limit of 1,000 ppm lead for the reuse of fill materials on the site relative to the construction of the Parts Coating Facility by American Axle and Manufacturing (AAM). If the material had an XRF field screening concentration of less than 1,000 ppm, an analytical concentration of less than 1,000 ppm, and a

TCLP lead concentration of less than 5.0 ppm, then the material could be reused elsewhere on site.

The cleanup goal of 5,000 ppm was based upon an exposure risk scenario for workmen at the AAM construction site in October 1994. A maximum concentration of 20,000 ppm lead was actually calculated; however, in a meeting between representatives of EMCON, GM, AAM, and Mr. Walia and Mr. Doster of NYSDEC, the NYSDEC representatives stated that they never historically accepted a cleanup level as high as 20,000 ppm. The highest they could accept would be 5,000 ppm. As a result of that meeting, the 5,000 ppm lead concentration was established as a cleanup goal.

Prior to any excavation work for the AAM Parts Coating Facility, GM had EMCON conduct a sampling effort through a series of borings to evaluate subsurface lead concentrations. Two areas exhibited lead concentrations above 5,000 ppm. As a result, these areas were excavated and the soils disposed of at an approved off-site facility as part of the "Hot-Spot Remediation" conducted November, 1994.

Concentrations for lead identified at the Site were considered in the Baseline Risk Assessment performed (Section 6 - SI Report). This Assessment indicated that lead exposure does not represent an unacceptable risk at the Site.

(5) Specific Comments

GM agrees that the fill materials at the Site are the source of lead; however, GM disagrees that these fill materials are contributing to degradation of groundwater quality. Lead concentrations are only elevated in unfiltered groundwater samples. Lead concentrations in filtered samples are near non-detectable. As a result, lead concentrations in groundwater are attributable to the solids present. It has not been demonstrated that lead has leached from the fill materials into the groundwater.

Secondly, "groundwater" at the site is actually water that is perched within the fill materials. This is not a usable aquifer. The first groundwater aquifer, that monitored by RW-95-1, is in the bedrock. Total (unfiltered) lead concentrations within this aquifer were found to be at 1 ppb; testing for dissolved (filtered) lead indicated no detectable concentrations.

As a result, GM agrees with their statement in the Site Investigation Report, that the fill materials are not compromising groundwater quality.

(6) Remaining Specific Comments

All remaining specific comments were addressed through the Supplemental Site Investigation program.

VOLUME I OF II

SITE INVESTIGATION REPORT

FORMER GM-SAGINAW BUFFALO FACILITY
NYSDEC SITE NO. 915152
BUFFALO, NEW YORK

(REPORT, TABLES, FIGURES AND DRAWINGS)

Prepared for

General Motors Corporation

Worldwide Facilities Group - Remediation Team

Detroit, Michigan

Issued October 1995

Revised January 1997

Prepared by

EMCON
Wehran-New York, Inc.
1775 Baseline Rd., Suite 220
Grand Island, NY 14072

Project 85740-000.000

CERTIFICATION OF PROFESSIONAL ENGINEER

DOCUMENT TITLE: **SITE INVESTIGATION REPORT, FORMER GM-SAGINAW BUFFALO FACILITY, NYSDEC SITE NO. 915152**

To the best of my knowledge, information, and belief, the information contained in this document is factual and was developed in accordance with the approved PCB and Lead Work Plan for the former GM-Saginaw Buffalo Facility, dated November 1994.

Michael W. O'Hara

Michael W. O'Hara, P.E.
Wehran - New York, Inc.

1/8/97

NYS P.E. License No. 60412

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EXECUTIVE SUMMARY

Wehran-New York, Inc. (EMCON) was retained by General Motors Corporation (GM) to complete an Interim Remedial Measure (IRM), consisting of a removal action, a Site Investigation (SI), and an Engineering Evaluation of Alternatives for Parking Lot #4 of the former GM-Saginaw Division facility (currently owned by American Axle & Manufacturing, Inc. [AAM]) located on East Delavan Avenue in the City of Buffalo, New York. The site is classified as a New York State Inactive Hazardous Waste Disposal Site, No. 915152. The IRM is being conducted in accordance with a Consent Order (Index No. B9-0410-92-09) between the New York State Department of Environmental Conservation (NYSDEC) and GM, which became effective on February 2, 1995.

The primary purpose of this SI report is to describe the work completed to date at the two operable units for the site which have been defined by the identified contaminants of concern: Operable Unit - 1 (OU-1) is for PCBs and OU-2 is for lead. The SI report covers the completed field work (including the removal of a clay tile pipe), additional investigation into the extent of PCB and lead contamination, and a risk assessment. It will be followed by an Engineering Evaluation of Alternatives Report which will identify the appropriate remedial response at both operable units.

EMCON began the work in February 1995. Investigations were performed in accordance with NYSDEC protocols, the Consent Order, and the agency's concurrence on the scope of work. Activities included review of historical data and reports; preparation of a supplemental site history report; excavation of a clay tile pipe, suspected to be the source of the PCB contamination, and surrounding fill as part of the removal action; installation of soil borings and collection of subsurface samples; sampling and testing of pre-existing and newly installed groundwater monitoring wells; sampling of sediment and water from the Site storm sewer system and Scajaquada Creek Drain; cleaning and repair of the Site storm sewers; and evaluation of data. The Scajaquada Creek Drain is the term used to describe where the re-routed Scajaquada Creek currently runs in a east-west direction below Scajaquada Street. The former channel of the creek is located north of Scajaquada Street in the sourthern portion of the Site.

NATURE AND EXTENT OF CONTAMINATION

Subsurface Soils

A total of 19 soil samples were collected for PCB analysis. Of these, only six had detections of PCBs. Five of the six samples came from the sidewalls of the IRM excavation. The concentrations ranged from 0.027 to 180 parts per million (ppm). The sixth sample was obtained from the former Scajaquada Creek channel at the east property line of the Site. Total PCBs were detected in this sample at 12.1 ppm. PCB contamination of soil attributable to the on-site source is primarily localized in the area around the IRM excavation. The PCB contamination identified in the former Scajaquada Creek channel is attributable to a potential source area located east of the Site on property owned by parties other than GM.

Lead was detected in all of the 54 samples analyzed. Concentrations ranged from 3 ppm to 14,000 ppm. Concentrations were randomly distributed across the site and are attributable to historical fill from non-GM sources.

Groundwater

PCB contamination at the Site is attributable to two source areas. PCB contamination, as a result of the clay tile pipe, is contained in the area around the original clay tile pipe and IRM excavation. The groundwater contamination, present as PCB Aroclors 1248 and 1260, is localized within the boundaries of the groundwater collection trench. There is no PCB contamination of the bedrock groundwater. The overlying native silty clay layer acts as a protective barrier against downward migration of contaminants and therefore, the groundwater located above the clay layer should be considered to lie within a perched water zone. The second source of PCB contamination, which is believed to originate off-site, is located within the former Scajaquada Creek Channel. PCB concentrations were highest at the east property line. No PCBs were detected downgradient, west of the Site on AAM property.

Total lead levels in unfiltered samples are slightly elevated in the shallow groundwater at the Site, with concentrations ranging from 0.001 to 0.250 mg/l, while lead concentrations in filtered groundwater samples ranged from 0.001 to 0.005 mg/l. As with the soils, due to the heterogeneous nature of the fill, it is impossible to attribute any pattern to the lead distribution in the groundwater. There is no lead contamination of the bedrock groundwater. The overlying native silty clay layer acts as a protective barrier against downward migration of contaminants.

Storm Sewers

PCBs were detected in the sediment of the storm sewer system at the Site at concentrations ranging from 0.67 mg/kg to 31 mg/kg. PCBs were detected in only one water sample from the storm sewer system at a concentration of 0.19 ug/l. The sample was collected from Manhole 1, that closest to the IRM excavation. Lead was present in the storm sewer sediments at concentrations ranging from 92 to 360 mg/kg, and in the water contained in the sewer at concentrations ranging from 0.001 to 0.014 mg/l. Lead was also present in the sediment and water from the Scajaquada Creek Drain both upgradient and downgradient of the Site at concentrations ranging from 51.1 to 171 mg/kg, and from 0.0014 to 0.0027 mg/l., respectively. PCBs were not detected in the Scajaquada Creek Drain.

FATE AND TRANSPORT

Groundwater

PCB contamination of the groundwater attributable to the clay tile pipe is contained in the area around the original clay tile pipe and IRM excavation. This investigation has indicated that PCB contaminated groundwater is not migrating beyond the groundwater collection trench previously installed downgradient of the clay tile pipe. A second source area, believed to be located on property east of the Site, has resulted in PCB-contaminated groundwater migrating through the former Scajaquada Creek channel. This contamination appears to be confined to the Site in the downgradient direction as evidenced by the fact that concentrations are highest at the east end and non-detect at the west side of the Site.

The fill materials cannot be viewed as a source of lead contamination to groundwater. The potential for off-site migration of lead is limited to the potential for solids to migrate through the fill matrix. This is considered minimal.

Storm Sewers

The Site storm sewer discharge contained both PCBs and lead in sediments. The major transport mechanism for both contaminants is believed to be through aqueous transport of contaminated sediments. Since the Site storm sewers were cleaned of sediments and repaired in July 1996, this pathway is considered incomplete. During the course of the investigation, PCBs were not detected in the Scajaquada Creek Drain.

RISK ASSESSMENT

Based on the baseline risk assessment, the Site does not pose a hazard to human health and the environment in its current condition. Exposure that could theoretically result in a health hazard is limited to hypothetical occupational exposure if PCB-contaminated soils were encountered during subsurface excavation. These hazards can be routinely addressed through standard health and safety protocols. Lead exposure does not represent an unacceptable occupantional risk at the Site.

1. INTRODUCTION

This Site Investigation (SI) Report has been prepared for General Motors Corporation (GM) for the former GM-Saginaw Buffalo Facility located in Buffalo, New York. The site has been listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York State as Site No. 915152.

The SI was completed in accordance with the Work Plan dated November 1994 as prepared by Wehran-New York, Inc. (EMCON). The Work Plan is Appendix A to a Consent Order between GM and the New York State Department of Environmental Conservation (NYSDEC) which became effective in February of 1995.

Initial field work was completed by EMCON on behalf of GM between March and May 1995. A Supplemental Site Investigation (SSI) was completed in response to the NYSDEC's comments on the SI report and in accordance with the supplemental work plan addenda dated February 7 and 21, 1996, July 10, 1996, and September 5, 1996. Field activities associated with the SSI were performed by EMCON on behalf of GM between March and September 1996. Data from the SSI has been incorporated in this report.

1.1 Report Organization

This report is presented in seven sections along with sheets, figures, tables, and appendices. This section, Section 1, Introduction, includes a discussion of the SI report purpose; site background consisting of site description and history; and previous investigations.

Section 2, Site Characterization Activities, provides a description of work completed at the site (e.g., drilling, well installation). This section includes a summary of the work with detail regarding each investigative methodology in the appendices.

Section 3, Physical Characteristics, includes a description of the site's surface features and hydrology. A discussion of the geology and hydrogeology is also provided for the overburden and bedrock.

Section 4, Nature and Extent of Contamination, describes results of chemical analysis in soil, storm sewer sediments and water, and groundwater.

Section 5, Contaminant Fate and Transport, details potential routes of migration, contaminant persistence, and contaminant migration. This section describes chemical transport in the storm sewers and groundwater.

Section 6, Baseline Risk Assessment, presents a risk evaluation as a result of human and environmental exposure to site-specific contaminants. The pathways considered include soil exposure, groundwater use, and off-site transport of sediments via the storm sewers.

Section 7, Summary and Conclusions, provides a summary of the sections along with conclusions on the results of the Site Investigation.

1.2 Purpose of the Report

The purpose of this SI report is to:

1. Discuss the site investigation activities conducted at the Site prior to and during the SI.

2. Characterize the site in terms of geology and hydrogeology.

3. Describe the removal action performed to address the suspected PCB source area at the site.

4. Characterize the nature and extent of the PCB and lead contamination at the Site and define the pathways for potential releases, and support the performance of a Risk Assessment.

5. Present the baseline risk assessment based on an evaluation of the PCB and lead contamination.

1.3 Site Background

Background information regarding the GM site location, description, and history is presented in the following subsections. This information is based on review of data files and records, as well as reports of previous investigations.

1.3.1 Site Description and Surrounding Area

The Site, a portion of a former GM-Saginaw facility, is located at 1001 East Delavan Avenue in Buffalo, New York (Figure 1-1). The property and facility are currently owned and operated by American Axle & Manufacturing, Inc. (AAM), which purchased the property and facility from GM in March 1994. The area of investigation (the "Site") consists of Parking Lot #4, a 14-acre parcel located east of the main facility and separated from the main facility by a Conrail right-of-way (ROW). The original NYSDEC Registry listing was for a one-acre area contaminated with PCBs around the Waste Water Treatment Plant (WWTP). This area is addressed as OU-1 of the SI. For purposes of this report, the "Site" is considered the entire 14-acre parcel including OU-1 and OU-2. OU-2 addresses the elevated lead concentrations in the fill materials. The Site is comprised of a paved parking area (Parking Lot #4), a WWTP, and a parts coating facility recently constructed by AAM. The facility and Site are shown on Drawing 1.

The other main feature at the Site is the storm sewer system. This consists of a main trunk running north to south with east-west laterals tying into the main. The storm sewer system provides surface drainage for Parking Lot #4. Flow in the storm sewers is from north to south. The system discharges into the Scajaquada Creek Drain below Scajaquada Street.

As shown on Drawing 1, the Site is bounded to the east by a Niagara Mohawk substation, vacant land, and other commercial development; to the south by Scajaquada Street with a residential neighborhood located south of the street; to the west by the Conrail ROW and the main portion of the AAM facility; and to the north by commercial property located along East Delavan Avenue. In general, the area is composed of residential, commercial, and industrial development.

1.3.2 Site History

Scajaquada Creek originally flowed through the southern portion of the Site. In the mid 1920's, the creek was relocated through a concrete conduit to flow underground, below what is now Scajaquada Street (Drawing 1). The former channel and adjacent low-lying areas were used as landfill space, primarily as an ashfill by the City of Buffalo.

From the period 1929 to 1933, it is reported in annual reports of the City of Buffalo Streets and Sanitation Department, that the Site was one of a number of locations used by the City for disposal of residential and institutional coal ash. This is documented in the "Site History Evaluation" prepared by the Western New York Heritage Institute, provided as Appendix A. In addition, bottles found by EMCON during site excavation activities dated from the 1920s and 1930s. This supports the time frame of landfilling at the Site set forth in the municipal reports.

Buffalo Gravel Corporation purchased and leased portions of the Site for operation of a concrete plant. The Site was used by Buffalo Gravel from 1947 until 1966.

GM first purchased the southern portion of the Site in May 1964 for use as an employee parking lot. This lot, Parking Lot #4, was constructed in August 1964. GM purchased two additional parcels north of the new parking lot in May 1965. All structures associated with the concrete mixing operation were demolished by GM-Saginaw Division in February 1966 and Parking Lot #4 was expanded to its current size (approximately 14 acres). Construction of the WWTP was begun in May 1967.

A collection trench for oil-contaminated groundwater was installed in 1988 to provide for cleanup of an industrial oil spill. PCBs and lead were detected in soil samples of excavated materials from the trench and from an abandoned clay tile pipe. The site was subsequently placed on the New York State Registry of Inactive Hazardous Waste Disposal Sites as a Class 3 site. The Class 3 designation is assigned to sites that do not present a significant threat to the environment.

The Site was sold to AAM on March 1, 1994, along with the main facility west of the Conrail ROW. As part of this conveyance, a deed restriction was placed on the property limiting it for use for industrial purposes only. No other development of the Site was conducted until November 1994, when AAM began construction of a parts coating facility on the northern third of Parking Lot #4.

1.3.3 Previous Investigations

Several investigations have been completed for GM at the Site. These investigations identified the presence of PCB and lead contamination at the Site. A summary, in chronological order, of these investigations along with a brief description of their intent and results is provided below. Test locations are provided on Drawing 2.

The initial investigation began in 1986 with the intent of satisfying the "Conditions for Major Petroleum Facility License." A study involving the installation of eight piezometers (B-1 through B-8) was completed in October 1986 to provide a preliminary characterization of the facility soils and groundwater. The results of this investigation provided a characterization of the geology and hydrogeology at the site and determined the placement of monitoring wells (Wehran, 1986). Monitoring wells MW-1 through MW-5 were installed as a result of this investigation. Only MW-1 and MW-5 are relevant to the current project since they are located on the Site, i.e., on the east side of the Conrail ROW.

In the spring of 1987, an investigation was performed to assess the permeability of soils underlying the existing, above-ground, reclaimed oil storage tank containment area adjacent to the WWTP. This investigation involved the excavation of four test pits (TP-1 through TP-4) in a continuing effort to meet the requirements of the Major Petroleum Facility License. An "ash-like" fill unit containing a considerable number of bottles was identified in the test pits. The results of the investigation indicated that oil had spilled onto the ground in the tank containment areas and had penetrated the underlying fill material (Wehran, 1987). As a result, the fill layer and groundwater in the vicinity of the tanks were contaminated with oil.

A hydrogeologic investigation was performed by Wehran Engineering (presently EMCON) in August 1987 to assess the extent of oil contamination. A total of 16 test pits (TP-3 through TP-18) were excavated to delineate the extent of the free product plume. The investigation concluded that an oil plume was present extending southwest from the tank storage area to the Conrail ROW. Based on the results of this investigation, several recovery and treatment system options were proposed to the NYSDEC. Passive collection and on-site treatment of the oil-contaminated groundwater was selected as the original remediation program for the site. Construction of a collection trench was undertaken in the fall of 1988. The construction involved two arms of the trench along the southern and western sides of the plume and the installation of a manhole which would act as a sump and collection point for the oil/water. In order to determine the disposition of soils excavated during construction of the collection trench, a test pit, TP-19, was excavated in October 1988. Soil samples were obtained for chemical analyses. Analytical results of the soil samples indicated the presence of PCBs. Because of the presence of PCBs, the groundwater collection system was not completed at that time.

In order to verify the presence of PCBs, an additional test pit (TP-A) was excavated near the western end of the groundwater collection trench in February 1989. This excavation exposed a clay tile pipe (six-inch inside diameter) surrounded by gravel approximately four feet below ground surface. Orientation of the pipe appeared to be northeast-southwest, placing it directly within the limits of the previously established oil-contaminated area. The pipe contained a significant amount of oil, and it appeared that the gravel bedding surrounding the pipe had acted as a preferential pathway for the oil within the subsurface. Oil observed seeping out of the pipe was subsequently sampled. One sample of oil was tested for PCBs by both GM and the NYSDEC. Analytical results indicated the presence of PCBs at concentrations of 2,678 ppm according to the NYSDEC and 8,420 ppm according to GM (Wehran, 1989).

Following discovery of the pipe and the possibility that residue in the pipe could be a source of PCBs, a series of staged investigations were performed to assess the lateral extent and orientation of the buried pipe. Overall, six test pits (TP-B through TP-G) were excavated as part of this investigation. In conjunction with the pipe investigation, further sampling of the oil, fill, and groundwater was conducted. Six borings (TB-1 through TB-6) were advanced and six temporary monitoring wells (piezometers) were installed, three wells within and three wells beyond the oil-contaminated area. These investigations were completed by Wehran in March, 1990.

Results of the investigation delineated the extent of the clay tile pipe and indicated the clay tile pipe extended within the oil-contaminated area. Samples from test borings alongside the abandoned pipe and near the aboveground storage tanks were collected and composited. PCBs were detected in the composite samples (Wehran, 1989).

Concurrent with the 1987 test pit investigation, a sample of oil contaminated "ash-like" fill from test pit TP-2 was analyzed for lead using the EP toxicity test. The lead concentration was measured to be 5.8 milligrams per liter (mg/l) in the sample leachate which exceeded the regulatory limit for hazardous waste characterization. As a result, confirmatory EP toxicity testing was completed in 1990 from test pit TP-2 (the test pit was re-excavated). The EP Toxicity results did not indicate the presence of lead (Wehran, 1990).

Due to the disparity in results, a third sampling effort was completed in April 1993 to assess whether lead concentrations were above the EP Toxicity regulatory threshold of 5.0 mg/l. In the third sampling event, samples were collected from the oil contaminated "ash-like" fill from four soil borings (TB-93-1 through TB-93-4) drilled around the test pit TP-2 location. These samples were analyzed for lead using the EP toxicity and Toxicity Characteristic Leaching Procedure (TCLP) tests. Lead levels from EP toxicity testing were an order of magnitude less than the regulatory threshold. TCLP results ranged from 0.11 mg/l to 4.8 mg/l compared to the regulatory threshold of 5 mg/l (Wehran, 1993).

An additional investigation was completed in 1993 to assess the extent of contamination in the area of the WWTP. The investigation involved the completion of 34 soil borings (BL-01 through BL-34) and analysis of samples for total lead, PCBs, and total petroleum hydrocarbons (TPH). TCLP lead analyses were also performed on boring samples. Fill materials were characterized into four categories: slag, "ash-like" fill, "ash-like" fill with oil, and topsoil. Samples of each type of material were sent for analysis. Lead concentrations were found to be the highest in "ash-like" fill and "ash-like" fill with oil samples. The maximum total lead concentrations in these two materials were 15,400 and 23,900 mg/kg, respectively. At depth in the original topsoil layer beneath the slag and "ash-like" fill layer, the lead concentrations were considerably lower, less than 100 mg/kg. The TCLP lead results indicated lead concentrations in excess of the 5.0 mg/l regulatory threshold in 8 of the 12 samples tested. PCBs were detected at concentrations ranging from 0.041 to 180 ppm in 12 out of 13 samples having observable oil. TPH samples were collected from two locations and had results ranging from 903 to 3160 ppm.

Review of plan and cross-sectional views of the distribution of lead demonstrated that elevated lead levels were highly variable both vertically and horizontally across the study area. The "ash-like" fill results contained similar lead levels to the "ash-like" fill with oil suggesting the oil and lead issues are unrelated. Furthermore, it was concluded that the lead contamination was not limited to the immediate vicinity of the oil containment area and that the oil did not appear to be the primary contributor to lead. Rather, the results indicated a "random" distribution of lead concentrations associated with the "ash-like" fill (Wehran, 1993).

As part of an unrelated investigation completed in 1994, one soil boring, SB-118, was installed on the east side of the Conrail ROW at the Site. This boring was located on the west side of the WWTP (Drawing 2). Lead results from samples collected from this boring indicated a total lead concentration of 1,360 mg/kg at a depth of 4 to 6 feet below ground surface. In addition, groundwater samples collected from monitoring wells MW-1 and MW-5 showed concentrations of total lead of 0.257 and 1.07 mg/l, respectively. Subsurface investigations on the west side of the Conrail ROW revealed that although the area was underlain by fill material, this fill was not the ash fill as found at the Site. Lead concentrations were considerably less than those from samples obtained from the Site. As a result, no work was proposed for the main portion of the facility west of the Conrail ROW.

During September 1994, a series of borings were completed in the northern portion of the Site. Malcolm Pirnie, Inc., of Orchard Park, New York completed five borings (BH-1 through BH-5) as part of a geotechnical investigation for structural design of AAM's proposed Parts Coating Facility (Drawing 2). Samples from these boring were collected and analyzed for total lead. Concentrations ranged from 50 to 757 mg/kg. Additional borings (BH-6 through BH-10) were completed by EMCON later that month. Soil samples consisted of the "ash-like" fill material, or the materials immediately above or underlying the "ash-like" fill material. Samples were collected from the five borings and analyzed for total lead. Concentrations ranged from 55 to 8,300 mg/kg, with the highest concentration located at BH-9. Due to the wide range of results, further work was warranted to assess lead distribution at the site.

Based on the results of the September 1994 sampling effort and to further assess lead concentrations in the area of the proposed AAM Parts Coating Facility, an additional 17 soil borings (BH-11 through BH-27) were completed by EMCON in the northern portion of the Site in October 1994 (Drawing 2). Borings were placed on a 100' x 100' grid throughout Parking Lot #4 in the area north of the WWTP. Samples underwent field screening for lead using X-Ray fluorescence (XRF). Samples recording the highest readings for lead with the XRF were selected for laboratory analysis. In most cases, selected soil samples consisted of the "ash-like" fill material.

The highest lead concentrations were detected in samples obtained from borings BH-13, BH-14, BH-17, BH-19, BH-20, and BH-26. Concentrations for the samples from these borings ranged from 1300 mg/kg in BH-26 to 5000 mg/kg in BH-17.

During November 1994, AAM initiated construction of the parts coating facility on the northern portion of the Site. Due to concerns by GM about the presence of "hot spot" lead concentrations, a remedial program was completed during November 1994. The remediation entailed the removal of lead-contaminated materials associated with borings BH-9 and BH-17. EMCON developed a risk-based cleanup goal for worker exposure to lead based on the OSHA permissible exposure limit. It was assumed that worker exposure might occur through incidental ingestion and inhalation of airborne lead (soil suspended as dust). Based on wind erosion of exposed soils during excavation, a maximum concentration of 20,000 mg/kg lead in soil was determined to still provide an acceptable level of exposure to workers. As a conservative measure, EMCON selected 5,000 mg/kg as a cleanup goal. Subsurface materials with total lead concentrations in excess of this threshold were excavated. An approximate four foot by four foot square area was excavated at both of these boring locations through the fill materials down to the top of native clay. Field XRF testing was used to confirm that no further excavation was necessary (i.e., thàt the total lead levels were less than 5,000 mg/kg). Confirmatory samples were collected and analyzed at a New York State Department of Health approved laboratory for lead using the NYSDEC Analytical Services Protocol (ASP). Results ranged from 350 mg/kg to 4,300 mg/kg.

Approximately 30 cubic yards of waste were generated as a result of this excavation. The excavated waste was manifested as a hazardous waste (D008) and transported off-site to Chemical Waste Management for stabilization prior to land disposal. The results of confirmatory sampling are provided in Appendix B.

The Consent Order between GM and the NYSDEC became effective in February 1995. As the initial step in complying with that Consent Order, EMCON conducted a historical review to assess the nature, origin, and extent of the "ash-like" fill material at the site. A report of the findings of the historical investigation was provided to the NYSDEC in March 1995. As a result of that report, the proposed boring locations presented in the November 1994 Work Plan were revised to better characterize the site. The newly proposed boring locations were accepted by the NYSDEC in a March 13, 1995 letter to EMCON.

2. SITE CHARACTERIZATION ACTIVITIES

The study area investigation includes a description of the field activities and methods used to aid in the physical and chemical site characterization. The data associated with the field activities is also identified in this section of the report.

2.1 Data Research

Existing data records and reports concerning the previous operation of the site were collected and reviewed by EMCON during the study area investigation. This effort involved review of files and records available at:

- City of Buffalo Department of Public Works;
- City of Buffalo Department of Streets and Sanitation;
- City of Buffalo Assessor's Office;
- Erie County Clerk's Office;
- Erie County Tax Department; and
- Western New York Heritage Institute.

In addition, EMCON conducted a review of historic aerial photographs and maps. This information was used in part to develop the Site History and Previous Investigations sections of this report.

2.2 Clay Tile Pipe Removal

Pursuant to the Consent Order, the interim remedial measure (IRM) included the removal of the suspected PCB source at the Site. The work was completed in March 1995. A trench, approximately 120 feet in length, by six to fifteen feet in width, and from five to seven feet in depth, was excavated in order to remove the clay tile pipe and associated bedding material, believed to be the source and preferential pathway of PCB contamination. Excavation and construction activities were conducted by Clean Harbors, Inc. and monitored by EMCON.

The excavation was completed using a track-mounted backhoe equipped with a 42 inch steel bucket. Excavation of the trench was begun underneath the cement pad adjacent to the WWTP. Once the general direction and depth of the clay pipe was determined, excavation of the asphalt and sub-grade material was completed along the length of the trench. The asphalt and sub-grade material was designated as "non-hazardous clean" material and was therefore segregated from soil designated as hazardous. At approximately the center of the trench length, a temporary test pit was placed to confirm direction and depth to the clay pipe. After removal of the asphalt and sub-grade materials, excavation of the ash-like layer and the oil laden ash-like layer was completed. All soil was placed in 18 22-cubic yard roll-offs for disposal at an approved hazardous waste facility.

Approximately 400 cubic yards of waste materials were generated as part of the IRM. The waste was manifested as a hazardous waste (D008, B007), solidified on-site by Clean Harbors, and transported off-site to Chemical Waste Management (CWM) in Model City, New York for disposal. In addition, approximately 56,000 gallons of non-hazardous liquid waste were transported to CWM for treatment and disposal. The liquid waste was generated as groundwater pumped from the IRM excavation, as well as purge water from on-site monitoring wells. Manifests for all waste shipments are provided as Appendix C.

The thickness of the asphalt and sub-grade ranged from approximately 0.5 feet to 1.5 feet along the length of the trench. The ash-like layer thickness ranged from approximately 2.5 feet to 5.0 feet. Overburden water was encountered at a depth of approximately 5.0 feet. The saturated zone was where the oil laden "ash-like fill" material was encountered. Water infiltrating the trench exhibited a thin layer of oil on the surface. Oil was also observed flowing freely from the bedding material of the clay pipe.

Once excavation of the trench and removal of the pipe was complete, EMCON collected analytical soil samples for field screening and laboratory analysis from both sides of the trench wall. Soil samples were collected from five locations, at three distinct depths (i.e. the "clean" asphalt layer, the ash-like layer, and the oil laden ash-like layer) at each location, and along both sides of the trench. This resulted in a total of 30 samples being collected. Soil samples were field screened for PCBs using an immunoassay testing kit. A summary of field screening results are provided in Table 2-1.

Six soil samples were sent for confirmatory laboratory analysis to Upstate Laboratories, Inc. (ULI) for PCBs in accordance with 1989 Analytical Services Protocol (ASP) procedures. In addition, four samples were sent to ULI for lead analysis, also in accordance with ASP.

Once soil sampling of the excavation was complete, Clean Harbors installed a new groundwater/oil collection drain consisting of geotextile, drainage stone, and perforated

PVC drain pipe in the excavation. Upon completion of the installation of the PVC drain, the excavation was backfilled with sand and paved with asphalt.

2.3 SI Program Rationale

Based on the previous investigations from 1987 to 1994 as discussed in Section 1.3.3, it was determined that the SI would focus on two contaminants of concern: PCBs, as addressed by Operable Unit 1, and lead, as addressed by Operable Unit 2.

The investigative elements included excavation of test pits, drilling of test borings and installation of monitoring wells, and sampling of soils, sediments, and water. The investigation was geared to provide ASP-quality data and fill in data gaps to further characterize the nature and extent of the PCB and lead contamination at the Site.

Test pits located on the east side of the WWTP were intended to locate drainage structures identified as part of the concrete mixing operation and believed to be contributing factors to the oil and PCB contamination at the site. Test boring and monitoring well locations were positioned in and around the area of the groundwater collection trench to evaluate the extent of PCB contamination, as well as in the storm sewer bedding to evaluate whether the storm sewers were acting as a preferential pathway for PCB migration. Sediment and water sampling was planned for the storm sewers to evaluate whether PCB contamination had entered the storm sewer system with the potential to migrate off-site.

Previous investigations had evaluated the extent of lead contamination on the northern portion of the Site and in the immediate area around the WWTP. Test borings were planned as part of Operable Unit 2 to further assess the presence of lead on the southern portion of the Site. Monitoring wells were proposed across the site to evaluate groundwater quality with respect to lead, as well as provide additional data to characterize the hydrogeology of the Site. Sediment and water sampling was planned for the storm sewers to assess whether lead contamination had entered the storm sewer system.

The SSI was conducted in response to NYSDEC comments on the SI. Additional test borings were planned to further assess the presence of lead in the vicinity of MW-203 and in the former Scajaquada Creek channel west of the site at the main portion of the AAM facility. Additional monitoring wells and sampling were proposed to evaluate the presence of PCBs detected in MW-203 and whether this PCB contamination was migrating from the IRM excavation area or was the result of a second source area. Sediment and water sampling was completed for the Scajaquada Creek Drain to assess whether the Site was impacting the creek.

2.4 Test Pitting

Test pits TP-95-1 and TP-95-2 were excavated on the east side of the WWTP using a track-mounted backhoe. The location of the test pits is shown on Drawing 3. The test pits were excavated to a depth of five to six feet below ground surface and were intended to locate drainage structures associated with the former concrete mixing operation. Soil samples were collected from the ash-like fill layer and from above the ash. No structures or oil-contaminated fill were observed. As a result, the test pits were backfilled with clean fill. Test pit logs are provided in Appendix D.

2.5 Geological Investigation

A geological investigation, consisting of the drilling of 32 test borings, and the installation of nine monitoring wells, was completed by Earth Dimensions, Inc. between March 27 and 30, 1995, and on March 28, 1996, July 11, 1996, and September 9, 1996. The borings were drilled around the perimeter and throughout the center of the Site to aid in the evaluation of hydrogeology and contaminant distribution characteristics. The test boring/monitoring well locations and their respective designations are presented on Drawing 3.

As shown on this drawing, locations BL-95-1 through BL-95-16 and BL-96-1 through BL-96-7 are test boring locations, MW-200 through MW-207 are overburden groundwater monitoring wells, and RW-95-1 is a shallow bedrock monitoring well.

2.5.1 Test Boring Procedures

The following paragraphs describe the drilling program methodologies.

2.5.1.1 Overburden Drilling

Soil borings were drilled using either a Mobile B-61 or CME-75 drill rig. Boreholes for the test borings and the overburden monitoring wells were advanced using four and one-quarter inch inner diameter (ID) hollow stem augers (HSA). For the test borings and overburden monitoring wells, continuous split spoon samples were collected using standard penetration test procedures (ASTM Method D1586) to the top of clay.

A surface cased monitoring well was installed to evaluate bedrock groundwater. The borehole for the bedrock well was advanced through the overburden soils using 6-5/8 inch ID HSAs. Continuous split-spoon samples were advanced to the top of clay. Drilling continued to the top of rock as determined by auger refusal. A four-inch diameter, black iron casing was then inserted through the HSAs and seated into the rock. Prior to removing the HSAs, the casing was tremie grouted into place.

Each soil sample obtained from the split-spoon samples was described and recorded on the boring log by EMCON using the Modified Burmister Soil Classification System and Unified Soil Classification System. A representative portion of the sample was placed into laboratory-provided sample jars. The lids were marked with the project name and number, boring number, sample number, sample depth, blow counts, date and collector's initials.

Auger spoils removed from the boreholes were placed into 55-gallon metal drums for disposal. Disposal was provided by CWM at their Model City facility.

Borehole logs are provided in Appendix D.

2.5.1.2 Rock Drilling

After the grout set in the bedrock boring for a minimum of 24 hours, the grout plug within the permanent black iron casing was removed. A double-tube HQ size core barrel was used to collect continuous five-foot lengths of rock core. The depth of the bedrock borehole was continued to approximately 10 feet into bedrock. Water was used as the lubricating fluid for the rock drilling. The amount of water lost to the bedrock formation was recorded.

Collected rock cores were placed into a wooden core box and logged by EMCON. The core run, depth of the run, percent recovery, and rock quality designation (RQD) were recorded. Rock core descriptions including the lithology, mineralogy, color, degree of weathering, fractures and contact depths were also recorded on the boring log.

The borehole log for bedrock well RW-95-1 is provided in Appendix D.

2.5.1.3 Decontamination

During drilling operations, care was taken to limit the potential for cross-contamination. This included steam-cleaning the augers, rods and tools between each boring. Steam-cleaning was performed on the containment pad at the WWTP using a high-pressure hot water wash.

The wash water was obtained from a municipal water tap at the WWTP. Wash water and soils were collected in a wash tub. The tub was periodically pumped free of water and the soils removed. This material was stored in 55-gallon drums. Disposal of the drums was completed by CWM in June 1995 and August 1996.

Split spoon samples were also decontaminated between soil samples by washing in an Alconox and water solution followed by a nitric acid, hexane, and potable water rinse.

2.5.2 Monitoring Well Installation

The overburden and bedrock monitoring wells were constructed of two-inch ID schedule 40 PVC riser pipe with 0.010-inch slotted well screens. The vertical position of the well screens were positioned to monitor overburden and shallow groundwater. The overburden monitoring wells straddle both the fill materials, as well as the underlying organic silt and clay units.

The general installation procedure for the monitoring wells consisted of lowering the assembled riser pipe and screen inside the permanent casing or HSAs to the desired depth. The annular space between the screen and borehole wall was backfilled with filter sand. The sand was typically installed to about one-half foot over the top of the well screen. The screen and sand were isolated by placing a bentonite slurry on top of the sand. A cement/bentonite grout was then placed above the bentonite seal to ground surface. The well was completed by installing a locking flush-mount or above-ground permanent casing.

Monitoring well installation details were recorded on the boring logs provided in Appendix D. A summary table of the well installation details is provided on Table 2-2.

2.5.3 Well Development

The wells were developed by EMCON to remove drilling fines and ensure the well was functioning properly. The well development took place on April 11 and 12, 1995, July 16, 1996, and September 10, 1996.. The wells were developed by surging and bailing using a dedicated bailer.

The pH, conductivity, temperature, turbidity, color, and odor were measured and noted periodically as the well development progressed. Well development continued until one of the following occurred: turbidity measurements were below 50 NTU, a minimum of 10 well volumes were removed from the well, or the well went dry.

A summary of the well development measurements is included in Table 2-3.

2.6 Water Level Measurements

During the SI field investigations, frequent water levels were measured by EMCON in the on-site monitoring wells between April 3 and 24, 1995. These wells included the six installed as part of the SI (MW-200 through MW-204 and RW-95-1), as well as existing wells MW-1 and MW-5 on the Site. Water levels were collected from all on-site monitoring wells as part of the SSI between October 18 and 29, 1996.

Water level measurements were taken using an electronic water level indicator referenced to a surveyed point located on top of the well riser pipe. Water levels were measured to the nearest 0.01 foot.

A summary of the water level measurements is presented in Table 2-4.

2.7 Hydraulic Conductivity Testing

EMCON conducted rising head slug tests in the monitoring wells on April 24, 1995 and September 17, 1996. The slug tests were completed to estimate the hydraulic conductivity of the subsurface materials in the immediate vicinity of the well. The equipment used for the slug tests included a bailer and water level indicator, as well as an In-Situ Hermit 1000C data logger and pressure transducer.

The rising head slug test was initiated by measuring the static water level, placing the bailer in the monitoring well, and allowing the well to stabilize. A bailer full of water was removed from the well, and the resulting decrease and subsequent increase in water level was recorded. Water level measurements were either recorded by the field engineer at specified time intervals or by the Hermit datalogger until the water level stabilized, typically within about five to 10 minutes.

The slug test results were analyzed using the Bouwer and Rice (1976) method. The resulting hydraulic conductivity values for the overburden wells are presented on Table 2-5. As shown on Table 2-5, the wells located in the former Scajaquada Creek channel are evaluated independently from the wells located in the ash fill material across the site due to the higher permeability of the former channel. Hydraulic conductivity calculations are provided in Appendix E.

2.8 Sampling and Analysis

The following subsections identify the sampling and analysis program of various environmental media used to define the nature and extent of contamination associated with the site.

2.8.1 Soils

Subsurface soil samples were collected and analyzed according to the sampling and analytical program outlined in the EMCON Work Plan and supplemental Work Plan addenda.

Subsurface soil samples from test borings BL-95-1 through BL-95-16, BL-96-2, BL-96-6, and BL-96-7, and the borings for monitoring wells MW-200, MW-201, MW-204 through MW-207, and RW-95-1 were collected by EMCON from March 27 through 30, 1995, and on March 28, 1996, July 11, 1996, and September 9, 1996. The samples were analyzed by Upstate Laboratories, Inc. (ULI) of Syracuse, New York for lead and PCBs in accordance with NYSDEC 1989 Analytical Services Protocol (ASP) procedures and reported in accordance with 1989 Contract Laboratory Protocol (CLP) requirements. In addition, soil samples from BL-96-8[1] and MW-205 through MW-207 were analyzed by Northeast Analytical, Inc. (NEA) of Schenectady, New York for congener-specific PCBs.

As per the Quality Assurance Project Plan (QAPP), the subsurface soil analytical results were validated to interpret the quality of the data and identify any specific problem areas. The soil results were validated by Data Validation Services (DVS) of North Creek, New York. The validation reports are provided in Appendix F.

2.8.2 Groundwater

Groundwater samples from MW-200 through MW-204, RW-95-1, as well as MW-1 and MW-5 were collected by EMCON between April 18 and 21, 1995. MW-203 was resampled on April 4, 1996 for PCBs and congener-specific PCBs. MW-203, MW-205, and MW-206 were sampled on July 16, 1996 for PCBs, congener-specific PCBs, and lead. MW-207 was sampled on September 11, 1996 for PCBs, congener-specific PCBs, and lead. Both filtered and unfiltered groundwater samples were collected and analyzed for lead. Filtering was conducted in the field using 0.45-micron disposable filters. The samples were analyzed and reported by ULI in accordance with NYSDEC 1989 ASP and CLP methods and protocol. Congener-specific PCB analyses were completed by NEA. As per the QAPP, the groundwater analytical results were validated by DVS. The data validation reports are provided in Appendix F.

2.8.3 Storm Sewers and the Scajaquada Creek Drain

Two sediment samples and one water sample were collected from on-site storm sewers by EMCON on April 11, 1995. The samples were designated MH-1 and MH-2. The approximate locations of the storm sewer manholes are shown on Drawing 3.

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[1] Sample BL-96-8 was collected on April 4, 1996 from the northwest side of the former clay tile pipe using a hand auger. The sample was used as a background sample to characterize the PCB contamination attributable to the clay tile pipe/IRM excavation area for congener-specific PCB analysis.

Water samples were collected with a pre-cleaned glass dipper bottle. The bottle was rinsed with the sewer water and then used to transfer samples directly into the sample containers provided by the laboratory. Sediment samples were collected using a stainless steel shovel.

The water sample collected from MH-2 was analyzed for PCBs and lead, while the sediment samples collected from MH-1 and MH-2 were sampled for PCBs only. To fully evaluate sediment and water samples for PCBs and lead, the NYSDEC requested that MH-1 and MH-2 be resampled. Both manholes were sampled for sediments and water in May 1995 and analyzed for PCBs and lead content.

Sediment and water samples were collected on April 3, 1996 from MH-2 and three locations from the Scajaquada Creek Drain: upstream of the Site storm sewer inlet to the drain, downstream of Site inlet to the drain, and downstream at the Site property line. All samples were analyzed for PCBs and lead content. Water from MH-2 was resampled for lead on May 21, 1996.

Samples were analyzed and reported by ULI using NYSDEC 1989 ASP and CLP protocols.

2.9 Survey

EMCON completed a field survey of the field investigation locations on April 5, 1995, April 1, 1996, August 1, 1996, and September 27, 1996. The newly installed monitoring wells and test boring locations were each horizontally located on the site grid and assigned appropriate horizontal coordinates of eastings and northings. Ground surface elevations were measured at each location and referenced to the vertical benchmark control provided by GM. In addition, elevations of the top of PVC well riser pipe and top of the outer protective casing of the newly installed monitoring wells were surveyed to an accuracy of ± 0.01 feet.

2.10 Storm Sewer Cleaning and Repair

As part of the IRM, the site storm sewers were cleaned to remove sediments and debris in order to eliminate the potential for contamination of the Scajaquada Creek Drain. Approximately 875 feet of the storm sewer system was cleaned. This included the eight-inch lateral running from Manhole 1 (near the former clay tile pipe) to the main in the center of the site, and the main from the junction with the eight-inch lateral to its junction with the Scajaquada Creek Drain. Eight catch basins along this section of sewer were also cleaned.

A power washer was used to flush water from one end of the storm sewer line. The ends of the main were temporarily plugged to prevent migration of contaminated rinseate and sediments to other portions of the site storm sewer system or into the Scajaquada Creek Drain. The rinseate and sediments were collected at the end of the main using a vacuum pump truck. Sediments were filtered out of the rinseate and stored on site in 55-gallon drums. The liquid waste was transferred to a static tanker for on-site storage and sampling to determine disposal alternatives.

Approximately two drums of sediments were generated as part of the sewer cleaning effort. The waste was manifested as a hazardous waste (D008, B007) and transported off-site to CWM in Model City, New York for disposal. Approximately 4,500 gallons of non-hazardous liquid waste (rinseate) was generated. This liquid waste was also transported to CWM for treatment and disposal. Manifests for the waste shipments are included in Appendix C.

Additionally, the cleaned portions of the storm sewer system were videotaped to confirm that all sediments and debris were removed. As a result of this video, a section of the eight-inch lateral running from Manhole 1 to the main was observed to be cracked. The crack was located within five to ten feet of Manhole 1. In addition, a two-inch pipe was observed discharging into one of the catch basins located along the main. The source of this pipe was unknown, however, a constant flow was observed draining from the pipe into the catch basin.

The broken section of pipe was replaced on September 12, 1996. The bedding material surrounding the pipe consisted of fine to medium sand. No oil or ash-like fill was observed in the excavation. This is consistent with the results of test boring BL-95-10, installed adjacent to Manhole 1 through the sewer bedding in April 1995. As a result, excavated materials were reused as bedding for the replaced section of pipe.

Also at the time of the sewer repair, an attempt was made to trace the origin of the two-inch pipe discharging into the main. It was found that the pipe was not continuous, but stopped after approximately six inches. The end of the pipe was open to the surrounding subsurface soils. It was assumed that the pipe was installed as a weep hole to relieve groundwater pressure from the side wall of the catch basin during construction of this portion of the storm sewer system (around 1964). The pipe was capped to prevent further drainage into the storm sewer system.

3. PHYSICAL CHARACTERISTICS

Section 3.0 of this report interprets the results of the study area investigation and describe the physical geography, geology and hydrogeology of the site and its surrounding areas.

3.1 Regional Setting

The GM Site is located in the west-central part of Erie County, New York (Figure 3-1). Erie County is located at the western end of New York State, along Lake Erie and the Niagara River. The Site is located within the City of Buffalo, approximately 4.5 miles inland to the east of the Niagara River. The area surrounding the Site is composed of residential, commercial, and industrial development.

3.2 Climatology and Meteorology

The climate of Erie County may be classified as humid continental. Air flow is primarily continental, coming from the south or southwest. Lake Erie affects weather by retarding spring warming and delaying the first frost in fall. Average temperature for the period from 1951 to 1977 as recorded at the Buffalo weather station by the National Oceanic and Atmospheric Administration (NOAA) is 47.8°F (USDA, 1986). The Buffalo weather station is located at the Buffalo International Airport, approximately five miles east of the Site.

Average annual precipitation is 37 inches, and is generally distributed throughout the year in either the form of rain or snow (USDA, 1986). Precipitation data for Erie County as recorded at the Buffalo weather station between 1951 and 1977 indicates the mean annual precipitation observed for the area is 37.31 inches with a high of 41.83 inches and a low of 32.61 inches.

3.3 Surface Features

Below is a discussion of surface features pertaining to the GM site both regionally and locally.

3.3.1 Physiography and Topography

The GM site occurs in the Erie-Ontario Plain physiographic province. The plain has little significant relief, typical of the topography of an abandoned lakebed. Elevations range from 700 to 1000 feet above mean sea level (MSL), with lows of around 569 feet above MSL along the Lake Erie shore (USDA, 1986).

The area is underlain by gently dipping layers of sedimentary rock covered primarily by the abandoned lakebed (LaSala, 1968; Owens and others, 1986). The Lockport Dolomite and the Onondaga Limestone, because they are relatively resistant to erosion, form low ridges along their east-west trending outcrop belts (LaSala, 1968). Ice contact sediments, deposited by the last glacial advance, also provide some relief in this region (Calkin, 1982).

3.3.2 Site Features

The Site is a fairly level, asphalt-paved parking lot. The only exceptions to this are two buildings, the WWTP and the AAM parts coating facility, and the gravel areas surrounding above-ground storage tanks associated with the WWTP. Elevation across the Site changes by approximately 11 feet, ranging from a high of 648.95 (73.5) feet above MSL in the northwest portion of the site to a low of 637.69 (62.24) feet above MSL in the southeast corner. In general, the site grades toward the center and to the south.

A storm sewer main runs north to south through the center of the site, with laterals running east-west. This storm sewer system provides surface water drainage for Parking Lot #4 and ties into the Scajaquada Creek Drain, just south of the site.

Prior to the late 1920s, the Scajaquada Creek channel bisected the southern portion of the site. The creek was rerouted underground through a man-made drain below what is now Scajaquada Street and the former channel was filled, as described in this report.

3.3.3 Off-site Features

An elevated railroad embankment (Conrail ROW) is located west of the Site, separating the Site from the main portion of the AAM Buffalo Plant. Another elevated railroad embankment, currently abandoned, is located to the east of the Site. A Niagara Mohawk electrical substation is located between the Site and the eastern embankment, east-southeast of the WWTP.

3.4 Surface Water Hydrology

The nearest surface water body to the Site is Scajaquada Creek. The creek is routed underground through a man-made drain below Scajaquada Street, the southern border of the Site (see Figure 3-2). This portion of the creek is referred to throughout the report as the "Scajaquada Creek Drain" and is classified as a New York State Class C surface water. The best usage of a Class C surface water such as the Scajaquada Creek Drain is fishing. The water should be suitable for fish propagation and survival, as well as primary and secondary contact recreation. The location of the drain eliminates its use for fishing or recreational activities.

The creek flows through an aboveground channel from its source to Schiller Park, located at the Cheektowaga-Buffalo line, approximately 1.2 miles southeast of the Site. At the Park, the creek flows underground through the conduit for approximately 3.5 miles until it reappears at Forest Lawn Cemetery in Buffalo. From this point, the creek flows aboveground for approximately two miles until it discharges into the Black Rock Canal and ultimately to the Niagara River.

3.5 Geology

A discussion of the regional and site geology is discussed in the following sections. A summary of the Site stratigraphy is provided in Table 3-1. In addition, Table 3-2 provides the stratigraphic interpretation for previous subsurface investigations.

3.5.1 Regional Geology

3.5.1.1 Bedrock

This region is underlain by bedrock formed by sediments deposited during the Upper Silurian and the Middle and Upper Devonian Periods. The bedrock dips gently southward at an average dip of 30 to 40 feet per mile. Therefore, the bedrock formations occur in bands that are east-west in orientation, with the oldest formations occurring to the north and the youngest formations occurring to the south (LaSala, 1968; Owens and others, 1986).

The bedrock that occurs beneath the GM site is the Onondaga Formation (Rickard and Fisher, 1970). The Onondaga Formation in western New York is a complex of massive, cherty, and argillaceous limestone approximately 140 feet thick. In the Buffalo area, this formation consists of four members (Oliver, 1966).

The lowest is the Edgecliff which is a medium light gray and medium-grained fossiliferous limestone. Light gray chert is irregularly present in the upper half of the unit. In this part of the state, the thickness is five feet or less. In some locations in the Buffalo area, the upper portion of the unit may consist of a reef facies (Oliver, 1966).

Overlying the Edgecliff Member in the Buffalo area is the Clarence Member which is a fine-grained sparsely fossiliferous limestone. Dark chert is abundant. The thickness ranges from 40 to 45 feet (Oliver, 1966).

The Clarence is overlain by the Moorehouse Member which is a medium-grained, light medium gray, massive fossiliferous limestone. The unit contains varying amounts of light and dark gray chert. The thickness of this unit is approximately 55 feet (Oliver, 1966).

Overlying the Moorehouse and forming the base of the Seneca Member is the Tioga Bentonite Bed. It is a four to ten inch clay bed that is volcanic in origin. It is very important for correlations in this region because the Seneca Member is not lithologically or paleontologically distinct from the Moorehouse in western New York. In the Buffalo area, above the Tioga Bentonite Bed, the Seneca Member is 40 or more feet thick (Oliver, 1966).

In the Buffalo area, the Onondaga Limestone outcrops in the subsurface along an east-west trending belt about two miles wide. It crosses the Niagara River in the Fort Erie-Buffalo area and continues to the east across almost the entire extent of New York State (Rickard and Fisher, 1970). Westward it extends across the length of the Niagara Peninsula of Ontario at least as far as Hagersville, Ontario (Cassa and Kissling, 1982).

3.5.1.2 Unconsolidated Deposits

Most of this region is covered by glacial sediment. Much of the bedrock is mantled by a layer of lodgment till, which is an unsorted, unstratified, usually dense, mixture of silt, clay, sand, gravel, cobbles, and boulders (LaSala, 1968). The surficial unit that covers most of this region, including the GM site, is glaciolacustrine silt and clay. This fine-grained, usually laminated sediment was deposited in a proglacial lake environment that was present at the end of the last glaciation (Cadwell and others, 1988).

Much of the relief in this region is attributable to the deposition from ice contact and morainal deposits from the glacier during recession. These sediments vary from poorly sorted and stratified sediment to well sorted and stratified sand and gravel. The Buffalo Moraine, which is classified as a till moraine, occurs just south of the GM site and extends several miles to the east and west (LaSala, 1968; Calkin, 1982; Cadwell and others, 1988). Throughout much of the City of Buffalo, the natural sediments are mantled by fill that consists of imported or reworked sediments or soil (Owens and others, 1986).

3.5.2 Site Geology

The geology across the site is fairly consistent. In general, the Site is covered by an asphalt parking lot. The pavement is underlain by bedding material composed of sand and gravel to a depth of approximately one foot. Below this in order of increasing depth are a layer of fill, a black organic silt layer which is discontinuous in some places, a gray to red silty clay unit, and the Onondaga Limestone bedrock. In places, primarily along the western end of the Site, a layer of gray to green slag exists between the pavement bedding and the fill material. Stratigraphic cross-sections of the Site are provided as Drawings 4 and 5.

The fill layer covering the site is comprised of two types of fill: ash fill and general miscellaneous fill, including pavement bedding, sewer bedding, and slag. The ash fill consists of brown, black, white, tan, and orange colored sand, silt, and gravel with ash, brick, coal, and glass intermixed. This unit ranges in thickness from approximately two to three feet in the southwestern portion of the site to three to greater than seven feet in the eastern and central portions of the site. The ash fill was not encountered in some locations on the extreme western end of the site, in those borings installed on the Conrail property west of the site, and in the borings installed west of the Conrail ROW on the main portion of the AAM facility.

The next unit consists of a black organic silt layer, typically about 0.25 to 1.0 foot in thickness except at MW-203 where it is greater than 4 feet thick. This layer is believed to be the original topsoil ground surface, prior to filling of the area, and is not continuous across the site.

Below the organic silt is the gray to red silty clay, generally encountered from four to eight feet below ground surface. The silty clay varies from soft to very stiff across the site. Thickness of this unit ranges from 10 to 12 feet.

Bedrock at the site is the Onondaga Limestone and is generally at a depth of 17 to 19 feet below ground surface. The Onondaga is a hard, crystalline cherty limestone, consistent with descriptions provided in the literature. The rock is gray in color and moderately weathered.

3.6 Hydrogeology

A discussion of the regional and site hydrogeology is discussed in the following sections.

3.6.1 Regional Hydrogeology

The major regional aquifer is the bedrock, which in this area is the Onondaga Formation. As discussed above, the Onondaga Formation is primarily a cherty limestone. Recharge occurs as precipitation induced infiltration into the bedrock. Water flows through the numerous open joints and bedding planes which provide the primary paths for groundwater flow within the rock. Regionally the groundwater moving through the Onondaga discharges into other bedrock formations or to surface water bodies directly. The ultimate groundwater discharge point in this region is likely the Niagara River. Yields of up to several hundred gallons per minute are possible in the Onondaga (LaSala, 1968). Groundwater is not used as a source of potable water in this portion of Erie County.

The lodgment till and glaciolacustrine deposits, due to the predominance of fine-grained sediment and/or poor sorting, are poor aquifers and usually form confining units where they occur.

3.6.2 Site Hydrogeology

Groundwater is first encountered at the site in the fill materials which overlie the low permeability, silty clay. The depth to groundwater is approximately three to four feet below ground surface across the site based on water level measurements obtained during April 1995 and October 1996 (Table 2-4).

It is worthwhile to note that for the most part, the overburden monitoring wells were constructed across the fill, organic silt, and upper portion of the native clay layer. MW-203 is the only exception. This well is screened almost entirely in the organic silt layer. Due to the limited saturated thickness of the fill layer over portions of the Site, the screened intervals of the wells were constructed to extend below the fill for the purpose of providing sufficient groundwater for sampling. The monitoring wells as constructed provide head data at or near the surface of the water table, and as such, accurately represent shallow groundwater flow across the Site.

Data obtained from the SI and previous investigations indicate that groundwater is perched within the fill layer. As depicted on Drawing 6, groundwater flow direction is generally to the south at a gradient of 0.009 foot per foot. Generally, variations in water level readings during April 1995 and October 1996 were only several tenths to less than a foot. From a seasonal perspective, it is anticipated that water levels would rise and fall congruently across the Site. Accordingly, groundwater flow conditions, as depicted on Drawing 6, would accurately represent groundwater flow at other times of the year.

The ultimate discharge point of shallow groundwater from the site is the former Scajaquada Creek bed. This is supported by the historical evidence that the area was once a low-lying marsh, draining toward the creek. Since the groundwater in the fill material is perched above the native clay, it is consistent that the groundwater flow would be in the direction of the original surface drainage

Results of the in-situ hydraulic conductivity tests performed on the overburden monitoring wells at the site are shown in Appendix E and are summarized in Table 2-5. The hydraulic conductivity of the overburden ranged from about $8.7\text{x}10^{-3}$ cm/sec in MW-202 to $4.1\text{x}10^{-4}$ cm/sec in MW-201. Because of the assumed low permeability of the native clays, the values of hydraulic conductivity of the overburden wells are likely most representative of the fill materials and to a lesser degree, the organic silt where present. Hydraulic conductivity in the former channel ranged from $2.27\text{x}10^{-2}$ cm/sec at MW-203 to $1.64\text{x}10^{-2}$ cm/sec at MW-207.

The geometric mean hydraulic conductivity for the overburden wells is calculated to be $2.32\text{x}10^{-3}$ or about 6.58 feet per day. The geometric mean hydraulic conductivity for the former channel wells is calculated to be $1.94\text{x}10^{-2}$ cm/sec or about 55 feet per day.

The velocity or rate of flux of groundwater is controlled by the permeability of the formation, the amount of pore space available for water to move through, and the hydraulic gradient. The rate of groundwater flow can be calculated using Darcy's Law modified to account for the pore spaces available:

$$V_s=Ki/n_e$$

Where:

V_s=Seepage Velocity
K=Hydraulic Conductivity
i=Hydraulic Gradient
n_e=Effective Porosity.

Assuming an effective porosity of 0.3 (Freeze and Cherry, 1979), which is reasonable given the sandy nature of the fill materials, a hydraulic conductivity of 6.58 feet per day, and a hydraulic gradient of 0.009 foot per foot, a groundwater velocity of 0.197 foot per day or 72 feet per year is calculated for the overburden fill materials.

The native silty clay deposit that underlies the fill materials across the Site is a significant confining layer which mitigates the migration of contamination vertically downward into the bedrock groundwater system. Based on the characterization of boring samples which penetrated the silty clay layer, and based on EMCON's experience with similar geologic settings, it is believed that the vertical permeability of the unit is on the order of 10^{-7} to 10^{-8} cm/sec. For the purpose of estimating vertical seepage velocity through this unit, a vertical hydraulic gradient of 1.0 is assumed. An effective porosity for the unit of 0.5 is chosen based on estimates provided in the literature (Freeze and Cherry, 1979) for this type of material.

Using the seepage velocity formula provided above, groundwater velocity through the clay is estimated to range from 0.02 to 0.2 feet per year. With an average clay thickness of 10 feet across the Site, it would take approximately 50 to 500 years for groundwater to pass through the native clay layer and flow into the underlying bedrock through advection. Attenuative mechanisms of retardation, adsorption, and biological degradation would result in even longer travel times for constituents in groundwater through the clay layer.

Based on water level measurements obtained during April 1995 and October 1996, the upper portion of the bedrock is unsaturated (Drawing 4). Permeability of the bedrock aquifer was found to be $2x10^{-2}$ cm/sec at RW-95-1. There is no information as to groundwater flow direction in the bedrock since there is only one bedrock monitoring point (RW-95-1) at the site. However, based on regional flow characteristics, it is reasonable to assume that the direction of groundwater flow is west-northwest toward the Niagara River.

The potential for migration of contamination along any bedding associated with the storm sewer system was also assessed. In this regard, three borings, BL-95-10, BL-95-11, and BL-95-16, were drilled immediately adjacent to the sewer line. The logs for these borings are provided in Appendix D. The bedding encountered consisted of fine to medium sand. Based on descriptions from other borings, this material likely exhibits similar permeability characteristics to the fill materials across the Site. As such, the bedding would not behave as a preferential high permeability migration pathway for contamination.

4. NATURE AND EXTENT OF CONTAMINATION

This section discusses the nature of the compounds detected and their extent in the affected media. Data generated as part of the SI and SSI have been validated as discussed in Section 2.6. Generally, these data are of good quality and only required minor modification. The modifications were made to the tables where the data are presented. The data validation reports are included in Appendix F.

In addition, data obtained from previous investigations (as discussed in Section 1.3) are included to more thoroughly evaluate the site. These data were not validated and were not generated according to ASP protocols, but are useful in enhancing the overall database for the site.

4.1 Operable Unit 1 - PCBs

Operable Unit 1 consisted of an Interim Remedial Measure (IRM) to remove the suspected source area and a subsurface investigation to determine the extent of PCB contamination in the soil and groundwater. The IRM was conducted in March 1995 and involved the excavation of an approximate 100 foot by 6 foot by 5 foot trench, removal of the clay tile pipeline and contaminated soils surrounding the pipe, and installation of a new pipe. The new pipe was connected to the existing manhole from the groundwater collection trench system which was previously constructed in 1988. As previously indicated, the collection system was constructed to collect oil and oil-contaminated groundwater. However, due to the detection of PCB contamination during the 1988 study, the collection system was not completed at that time. Drawing 7 shows the location of the IRM and the existing groundwater collection trenches. Although the IRM is not considered to be a complete remedial action since not all soil exceeding the 10 ppm subsurface cleanup level for PCBs was removed, the IRM did remove the source area and was completed in accordance with the NYSDEC-approved work plan. Remediation of this area will be completed through implementation of the selected alternative as determined by the Engineering Evaluation of Alternatives Report for OU-1.

Soil samples were collected from the side walls of the IRM excavation and analyzed for PCBs. In addition, 12 soil borings, six of which were completed as monitoring wells, were installed and sampled for PCBs. Groundwater from all on-site monitoring wells and sediment and water from two on-site storm sewer manholes, as well as the Scajaquada Creek Drain, were also sampled for PCBs.In addition, data from investigations conducted in April 1987; October 1988; June and July 1989; April 1990; and April and November 1993 are also included to augment the database.

Results of the sampling and analysis from the SI effort and previous investigations are described below by media. The data are summarized in Tables 4-1 through 4-5 and are shown on Drawings 7, 7A, 8, and 9.

4.1.1 Soil

To assess the presence/absence of residual PCB contamination associated with the IRM excavation, six samples from the IRM trench sidewalls were collected and analyzed for PCBs. PCBs were detected in five of the six soil samples obtained from the side walls of the trench excavation. Sample SET-C2 (southeast trench wall) was non-detect for PCBs. As shown in Table 4-1, sample SET-A1 contained 0.17 mg/kg (part per million, ppm) PCBs as Aroclor 1260, while samples NWT-E2 (northwest trench wall), NWT-B2, NWT-C3, and SET-E3 had detections of PCBs as Aroclor 1248 ranging from 0.027 to 180 mg/kg. The excavation was not expanded to remove these soils since the sampling locations were below the water table. The intent of the Work Plan was to remove the clay tile pipe and contaminated soils in the unsaturated zone. The newly installed pipe would provide for the controlled removal of PCBs in the saturated soils below the perched water table. Drawing 7A shows the PCB contamination in the soil samples collected from the IRM excavation.

In addition to the sampling associated with the IRM, 12 soil borings were drilled and sampled for PCBs at other locations on the Site. The analytical results are summarized on Table 4-1 and shown on Drawings 7 and 7A. PCBs were detected in the soil sample collected from borehole MW-206 at a total concentration of 12.1 mg/kg as Aroclors 1248 (tentative identification) and 1260. Congener-specific analyses confirmed the presence of PCBs. MW-206 is located in the former Scajaquada Creek channel at the east property line. PCBs were not detected in MW-205, located midway between the groundwater collection trench/IRM excavation area and MW-203, or in MW-207, located in the former Scajaquada Creek channel on the west side of the Conrail ROW at the main portion of the AAM facility.

In addition, a soil sample (BL-96-8) was collected from the IRM excavation area and sent for congener-specific PCB analyses. Analysis of this sample revealed a clear pattern for Aroclor 1248. Congener-specific PCB analysis of soil from MW-206 had a chromatographic profile, characterized by significant non-PCB peaks, distinctively different from the profile for BL-96-8.

Previous investigations found PCBs present in the soils in and around the groundwater collection trench and IRM excavation area ranging in concentrations from non-detect to 377 mg/kg PCBs as Aroclor 1248. These results, which were not validated, are presented on Table 4-2 and are shown on Drawing 7. In addition, visual observations noted during test pitting in the August 1987 investigation (Wehran, 1987) and drilling in the November

1993 investigation (Wehran, 1993) did not identify oil contamination south of the groundwater collection trench.

As a result of these investigations, it appears that two source areas exist. PCB contamination in soil is found in the saturated zone and is localized in the area of the original clay tile pipe and IRM excavation, south of the WWTP (the confirmed Site source area). Most of the contamination is contained within the boundaries of the groundwater collection trench system. The only exceptions to this are soils in the area of TB-93-1 through 4, BL-04, and BL-09, all located in the vicinity of the reclaimed oil storage tank containment area.

The second source of PCB contamination affects the former Scajaquada Creek channel. This is supported by the fact that PCB contamination is present in the former Scajaquada Creek channel at wells MW-203 and MW-206, but not at points in between the former channel and the confirmed Site source area (the IRM excavation area). Additionally, the distinctively dissimilar chromatographic profile for soil collected from MW-206 when compared to a soil sample from the IRM excavation area further supports this conclusion. It would appear that the second source area is located east of the Site, on property belonging to parties other than GM, as further discussed in Section 4.1.2.

4.1.2 Groundwater

Groundwater samples were collected from monitoring wells MW-200 through MW-207, MW-1, MW-5, and RW-95-1 and analyzed for PCBs. The only detections of PCBs were in MW-203 and MW-206. MW-203 was first sampled in April 1995 and was found to contain Aroclor 1242 at a concentration of 0.38 ug/l (parts per billion, ppb). The well was resampled in May 1995, confirming the presence of Aroclor 1242 at a concentration of 0.2 ug/l, and again in April 1996, showing the presence of Aroclor 1242 at a concentration of 0.2 ug/l as well as Aroclor 1260 at 0.18 ug/l. MW-203, MW-205, and MW-206 were sampled in July 1996. PCBs were detected in MW-203 and MW-206 as Aroclors 1242 and 1260, with concentrations in MW-206 (2.9 ug/l total PCBs) being approximately 10 times higher than those found at MW-203 (0.3 ug/l total PCBs). Congener-specific analyses confirmed the presence of PCBs. Additionally, as observed in the congener-specific analysis of soil from MW-206, analysis of the groundwater from MW-203 and MW-206 showed a distinctive chromatographic profile, characterized by significant non-PCBs peaks making identification of the specific Aroclors tentative. PCBs were not detected in groundwater samples from MW-205 and MW-207. A summary of PCB results in groundwater is provided in Table 4-3 and shown on Drawing 8.Groundwater samples were collected and analyzed during previous investigations conducted in June 1989 and April 1990. These investigations indicated the presence of PCBs in groundwater at concentrations ranging from non-detect to 15,000 ug/l of Aroclor 1248. The detection of PCBs at the 15,000 ug/l concentration is suspect since it is improbable that groundwater could have such a high concentration of PCBs due to the low aqueous solubility of PCBs (refer to Table 5-1). It is probable that the sample analyzed by the laboratory contained an oil layer or oil and water emulsion. A summary of results from these previous investigations is provided as Table 4-4 and shown on Drawing 8.

Based on the current and historic results, it appears that two source areas exist. PCB contamination in the groundwater attributable to the original clay tile pipe and IRM excavation (the confirmed Site source area) is primarily contained in this area. The groundwater contamination, present as PCB Aroclors 1248 and 1260, is localized within the boundaries of the groundwater collection trench.

The second source area affects groundwater present in the former Scajaquada Creek channel as shown by data collected from wells MW-203 and MW-206. It is worthwhile to note that while Aroclor 1242 was detected in MW-203, its presence is unrelated to the Aroclor 1242 detected in TB-4, TB-5, and TB-6 as summarized in Table 4-4. In other words, a southerly migration of PCB contamination from this area to MW-203 is not possible. The TB installations are located hydraulically upgradient of the groundwater collection trench area. Only Aroclors 1248 and 1260 have been detected in the groundwater collection trench area. There have been no detections of Aroclor 1242 in this area during the SI. Furthermore, no PCBs have been detected in MW-5 and MW-205, monitoring wells located between the IRM area and MW-203.

The second source area is believed to be located off-site, to the east of the GM property. This is supported by the fact that PCB concentrations at MW-206 are on the order of ten times greater than concentrations at MW-203, and that groundwater flow through the former channel is from east to west as supported by the hydrogeologic data (Drawing 6A). Additionally, congener-specific PCB analysis of the groundwater samples from the wells in the former channel showed the same chromatographic profile as was evidenced in the soil sample from MW-206, but not in a PCB-contaminated soil sample collected from the IRM excavation area (BL-96-8).

PCBs were not detected in the bedrock well. This supports the finding that the native clay deposits underlying the fill act as a protective barrier to the downward migration of contamination into the aquifer at the site as discussed in Section 3.0.

4.1.3 Storm Sewers

In April 1995, sediment samples were collected from a catch basin east of the IRM excavation in Manhole 1 (MH-1), and from Manhole 2 (MH-2), the last accessible manhole near the south end of the site before the storm sewer ties into the Scajaquada Creek Drain. As per the Work Plan, only sediments were required to be sampled for

PCBs from Manholes 1 and 2. After a meeting between NYSDEC, EMCON, and GM presenting the April 1995 results, the NYSDEC requested that sediment and water be sampled from both manholes for PCBs. This second sampling round was completed during May 1995. Based on additional comments from the NYSDEC, sediment and water samples were collected from the Scajaquada Creek Drain and Manhole 2 for lead and PCBs. This sampling was conducted in April 1996. Results of the April and May 1995 and April 1996 sampling rounds are discussed below, summarized in Table 4-5, and shown on Drawing 9.

4.1.3.1 Dry Weather Water Sampling

Water sampling of the storm sewers was conducted during dry weather. As a result, the water obtained from Manhole 1 most likely remained in the catch basin from a previous storm event, while the water from Manhole 2 was representative of groundwater infiltration rather than stormwater. Results from the May 1995 sampling indicate the presence of PCBs in the water at a concentration of 0.19 ug/l as Aroclor 1248 in MH-1. PCBs were not detectable in water obtained from MH-2. PCBs were not detected in the water sample from Manhole 2 or from the three water samples collected from the Scajaquada Creek Drain during the April 1996 sampling.

As stated above, MH-1 is located approximately 20 feet east of the IRM excavation. The bottom of the manhole is above the water table. As such, the potential for infiltration of PCB-contaminated groundwater or oil into MH-1 is minimal. The PCBs detected in the water sample are most likely a result of entrainment of PCB-contaminated sediments. Additionally, the results of test boring BH-95-10, as well as observations made during repair to the sewer lateral conducted in September 1996, showed no visible oil and no PCBs in the sewer bedding material. As a result, the storm sewer bedding material for Manhole 1 and the connecting lateral are not acting as a migratory pathway for oil or PCBs from the IRM excavation area.

The bottom of the invert at MH-2 is located below the water table. At the time of the sampling events, water was trickling through the sewer line, despite the fact that the sampling was conducted during dry weather. This flow represents groundwater infiltration into the storm sewer. PCBs were not detected in the water sample from MH-2. As a result, we can conclude that the sewers are not acting as a migratory pathway for contaminated groundwater. Additionally, the results of the Scajaquada Creek Drain sampling were non-detectable for PCBs. As a result, the site is not impacting the Scajaquada Creek Drain.

4.1.3.2 Sediment

PCBs were detected in sediment samples collected from Manhole 1 at concentrations of 1.2 mg/kg as Aroclor 1248 in April and at 2.3 mg/kg as Aroclor 1248 in May 1995.

These concentrations are consistent between the two sampling events. The April sediment sample obtained from Manhole 2 had PCBs detected at 0.67 mg/kg as Aroclor 1248, while the May sample had a detected concentration of 31 mg/kg as Aroclor 1248. Manhole 1 is designed to have a sediment sink so that sediment does not flow through the storm sewer with the water. Field observations indicate that the sediment in Manhole 2 was crust-like and was difficult to penetrate for sampling. PCBs were not detected in the sediment samples collected from Manhole 2 or from the Scajaquada Creek Drain during the April 1996 sampling event.

Based on this sampling, it is apparent that PCBs are present in the storm sewer sediments, particularly in Manhole 1. However, the geometry of the catch basins is such that the sediment lies below the level at which the water typically flows. Sediments should remain in the catch basins. As shown by the sampling results from the Scajaquada Creek Drain, the site has not impacted the sediment within the drain.

Furthermore, the sewer cleaning effort, conducted in July 1996, removed the sediments from the lateral leading from Manhole 1 to the main and from the main leading to the Scajaquada Creek Drain. Additionally, a broken section of the lateral adjacent to Manhole 1 was replaced in September 1996. As a result of the storm sewer cleaning and repair, there should be no future potential for PCB-contaminated sediments to enter the storm sewer system or the Scajaquada Creek Drain.

4.2 Operable Unit 2 - Lead

Work conducted as part of Operable Unit 2 consisted of the excavation and sampling of two test pits, installation and sampling of 28 soil borings, and completion of six monitoring wells. Soil samples were analyzed for total lead. In addition, groundwater samples from all on-site monitoring wells were collected and analyzed for total and dissolved lead. Sediment and water samples from two on-site storm sewer manholes and from three locations in the Scajaquada Creek Drain were also sampled for lead.

In addition, data are included from investigations conducted in April 1987; April and November 1993; and September and October 1994. Also, data obtained by EMCON from November 1994 to July 1995 during construction monitoring of the AAM Parts Coating Facility are also discussed. Results of the sampling and analysis from the current SI effort and previous investigations are described below by media. The historic and current data are summarized in Tables 4-6 through 4-11 and are shown on Drawings 10, 10A, 11, and 12.

4.2.1 Soil

In March 1995, two soil samples were collected from each of the 22 boreholes (BL-95-1 through BL-95-16, MW-200 through MW-204, and RW-95-1) installed as part of the SI and analyzed for lead. Generally, soil samples for total lead analyses were obtained from the ash layer and material immediately above the ash. Two soil samples from each of two test pits (TP-95-1 and TP-95-2) installed on the east side of the WWTP were also collected and analyzed for lead. In addition, four soil samples were collected from the sidewalls of the trench excavated as part of the IRM for PCB remediation. One soil sample was collected from each of the six boreholes (BL-96-2, BL-96-6, BL-96-7, and MW-205 through MW-207) installed in 1996 and analyzed for total lead. The samples were obtained from the ash-like fill where present. The ash-like fill was not present in boreholes BL-96-6, BL-96-7, and MW-207, all located west of the Conrail ROW at the main portion of the AAM facility. Lead sampling results are summarized in Table 4-6 and shown of Drawings 10 and 10A.

Lead was detected in every sample above laboratory quantitation limits at concentrations ranging from 3 mg/kg to 14,000 mg/kg. Of a total of 61 samples, 49 had concentrations of lead between 3 and 1000 mg/kg, 10had concentrations between 1,001 and 5,000 mg/kg, and two samples had concentrations greater than 10,000 mg/kg. There were no samples with concentrations detected in the range of 5,000 to 10,000 mg/kg.

Six samples were submitted for TCLP lead analysis as part of the investigation. Of the six samples, two exceeded the characteristically hazardous regulatory limit under RCRA of 5.0 mg/l. Both of these samples, BL-95-9, S3 and BL-95-13, S2, had total lead concentrations greater than 10,000 mg/kg (14,000 mg/kg and 12,000 mg/kg, respectively).

Previous investigations from 1987 to 1990 provided minimal information as to the nature and extent of lead contamination at the site. Recent investigations in 1993 and 1994 better addressed the distribution and concentrations of lead in the subsurface. A summary of lead results from all historical investigations is provided in Table 4-7 and Table 4-8.

As part of an investigation conducted in November 1993, 34 soil borings (BL-01 through BL-34) were installed in the area around the WWTP to identify the extent of lead in the soil. Results of this investigation showed total lead concentrations ranging from non-detectable to 23,900 mg/kg. Of a total of 116 samples analyzed for total lead, 65 samples had concentrations of lead ranging from non-detectable to 1,000 mg/kg; 44 samples had concentrations ranging from 1,001 mg/kg to 5,000 mg/kg; three samples had concentrations ranging from 5,000 mg/kg to 10,000 mg/kg; and four samples had concentrations greater than 10,000 mg/kg. The investigation found that lead concentrations were highest in the ash fill material, but were not evenly distributed across the investigation area. The ash fill material was very heterogeneous, supported by the random distribution of lead throughout the material.

Another subsurface investigation was conducted on the north side of Parking Lot #4 from August to November, 1994, prior to the construction of the AAM Parts Coating Facility. This investigation involved the installation of 27 soil borings (BH-1 through BH-27). Five borings were initially completed by Malcolm Pirnie and the remainder were completed by EMCON. Results of total lead sampling found concentrations of lead in the ash layer ranging from 50 mg/kg to 8,300 mg/kg. Of 35 samples, 24 had total lead concentrations between 50 mg/kg and 1,000 mg/kg; nine samples had concentrations between 1,000 mg/kg and 4,999 mg/kg; and two samples had concentrations between 5,000 mg/kg and 10,000 mg/kg.

The current and historic investigations confirm that the lead contamination in soil is randomly distributed across the site and is attributable to the "ash-like" fill.

4.2.2 Groundwater

Groundwater samples were collected from monitoring wells MW-200 through MW-207, MW-1, MW-5, and RW-95-1 and analyzed for both total (unfiltered) and dissolved (filtered) lead. A summary of the lead results in groundwater is provided as Table 4-9, and shown on Drawing 11.

Within the perched groundwater within the fill layer, total lead concentrations in unfiltered samples ranged from non-detectable in MW-1 to 0.25 mg/l in MW-206. There were five detections of lead in filtered samples at MW-1, MW-203, MW-204, MW-206, and MW-207. Concentrations ranged from 0.001 mg/l in MW-204 to 0.005 mg/l in MW-1.

In the bedrock well (RW-95-1), the concentration of total lead was only 0.001 mg/l in the unfiltered sample while lead was not detected in the filtered sample. This indicates that the native clay deposits underlying the fill act as a protective barrier to the downward migration of contamination as discussed in Section 3.0.

Groundwater samples were collected and analyzed for lead during previous investigations conducted in June 1989, April 1990, and April 1994. These investigations indicated the presence of total lead in the perched groundwater at concentrations ranging from 0.006 mg/l to 9.8 mg/l. Lead was found in the filtered samples collected in April 1990 at concentrations ranging from 0.007 mg/l to 0.42 mg/l. Data from the 1989, 1990, and 1994 investigations were not produced according to ASP protocols and were not validated. A summary of results from these previous investigations is provided in Table 4-10.

It is commonly observed in groundwater investigations that concentrations of metal parameters, including lead, are elevated in unfiltered relative to filtered groundwater samples. This is due to the presence of aquifer materials in unfiltered samples that have a tendency to adsorb metal constituents. In addition, lead is a naturally occurring constituent in many earth materials (e.g., coal). In filtered groundwater samples, suspended materials have been removed prior to analysis. As such, metal concentrations are almost invariably lower in filtered samples. Filtered lead results provide a more accurate picture of the fraction of lead that is more mobile in groundwater.

Total (unfiltered) lead in the groundwater is slightly elevated in six of the ten existing overburden monitoring wells at the site. Also, based on the disparity between lead concentrations in filtered and unfiltered samples, it can be concluded that elevated lead levels in the groundwater are attributable to the suspended materials, originating from the fill materials in the immediate vicinity of the monitoring wells.

4.2.3 Storm Sewers

MH-2 was sampled in April 1995 for lead in water. Sediments were not sampled for lead from either manhole in April 1995. At the request of the NYSDEC, both sediment and water from both manholes were sampled for lead in May 1995. Based on additional comments from the NYSDEC, sediment and water samples were collected from the Scajaquada Creek Drain and Manhole 2 for lead and PCBs. This sampling was conducted in April 1996. Results of the April and May 1995 and April 1996 sampling rounds are discussed below, summarized in Table 4-11, and shown on Drawing 12.

4.2.3.1 Dry Weather Water Sampling

Lead was detected in the water samples collected from MH-1 at a concentration of 0.014 mg/l in May 1995 and from MH-2 at concentrations of 0.001 mg/l in April 1995, 0.002 mg/l in May 1995, and 0.027 mg/l in April 1996. Due to the elevated result obtained from the April 1996 sampling when compared to the 1995 results, Manhole 2 was resampled in May 1996. Lead was detected at a concentration of 0.002 mg/l. These concentrations are consistent between the various sampling events (with the exception of the April 1996 result for Manhole 2). Water samples collected from the Scajaquada Creek Drain ranged from 0.0014 mg/l upstream of the Site storm sewer outfall to 0.0027 mg/l downstream of the outfall. These results are consistent with the results obtained for the Site storm sewer system.

4.2.3.2 Sediment

As stated above, sediments were not sampled from either manhole for lead in the April sampling round. The results of the May sampling showed a concentration of 360 mg/kg lead in the sediment from MH-1 and a concentration of 92 mg/kg in the sediment from MH-2. Manhole 1 is designed to have a sediment sink so that sediment does not flow through the storm sewer with the water. Field observations indicate that the sediment in Manhole 2 was crust-like and was difficult to penetrate for sampling. The results of the April 1996 sampling showed a concentration of 34.6 mg/kg lead in the sediment from MH-2 and concentrations ranging from 51.1 mg/kg in the upstream sample to 178 mg/kg in the downstream sample collected from the Scajaquada Creek Drain.

Based on this sampling, it is apparent that lead is present in low levels in the storm sewer sediments as well as in the Scajaquada Creek Drain.

5. CONTAMINANT FATE AND TRANSPORT

Section 4.0 describes the nature and extent of contamination at the GM study area. This section includes a discussion of potential routes of migration, contaminant properties, and processes affecting persistence and contaminant migration.

5.1 Potential Routes of Migration

The following section describes potential routes of PCB and lead migration from the GM site in groundwater and stormwater runoff/sediment systems.

5.1.1 Groundwater

Groundwater pathways for potential contaminant transport exist within the overburden at the GM site. The primary groundwater pathway is groundwater movement horizontally in the overburden fill materials at the site. Hydraulic head distributions in the overburden indicate a horizontal gradient to the south. The magnitude of groundwater velocities in the overburden fill material is estimated to be on the order of 72 feet per year. The ultimate discharge is to the former Scajaquada Creek Channel.

In addition, the storm sewer system bedding was evaluated to determine if it could be a preferential pathway for groundwater migration. Samples obtained from test borings drilled through the sewer bedding did not indicate that the bedding would act as a high permeability preferential pathway. This is because both the bedding and fill materials across the site are of similar permeability.

Groundwater migration vertically to the bedrock is not anticipated due to the presence of the low permeability silty clay layer underlying the site and results of groundwater sampling of the bedrock aquifer. PCBs and dissolved lead were not detected in the groundwater samples obtained from bedrock monitoring well RW-95-1, confirming that the native clay layer is protective of the bedrock. Additionally, lateral migration of the groundwater from the site to surface waters is not a significant pathway due to the lack of surface water bodies in the vicinity of the site.

5.1.2 Stormwater Runoff and Sediment

Surface water runoff from the site is intercepted by storm sewer basins throughout the site and carried to the Scajaquada Creek Drain, part of the Buffalo Sewer Authority storm sewer system. Once in the sewer system, runoff is ultimately discharged to Scajaquada Creek. Under open channel conditions, surface water in Scajaquada Creek drains to the Black Rock Canal, and in turn, discharges to the Niagara River.

Sediment transport from the site occurs along the primary pathway described for runoff. Secondary pathways (i.e., sediment contributions to air or groundwater) are expected to be minimal. In general, sediment transport is a function of several factors including sediment particle size, surface water runoff velocity, and surface conditions (e.g., pavement or vegetative cover), among others. As sediment is entrained and carried along the indicated pathways, settling will occur where transport velocities decrease (e.g., bend in flow path). As such, at discrete locations along the pathway, sediment will accumulate. Fine particle size sediment (e.g., colloidal particles), however, will stay suspended within water and probably travel the same routes as surface water (i.e., within the storm sewers).

5.2 Properties and Processes of Contaminants of Interest

To further understand the fate and transport of contaminants along pathways, physicochemical and the biogeochemical processes affecting persistence of contaminants of concern in the environment must be considered. Previous investigations have identified the contaminants of interest for the site as lead and PCBs.

5.2.1 Physical and Chemical Properties

Physical and chemical properties of specific contaminants can provide valuable insight relative to their potential behavior in the environment. Assessing the mobility of a chemical species is usually done by determining a sorption coefficient.

For inorganic materials, this sorption is usually termed K_d, the distribution coefficient, and is equal to the ratio of the mass of the chemical sorbed on the solid phase divided by the mass of the chemical remaining in solution. Large K_d values indicate that more chemicals are sorbed to the soils and the chemical is less mobile.

For most organic contaminants, the amount of sorption can be expressed by a Freundlich constant (K). If the sorption of the chemical is linear (i.e., not influenced by concentration), then K is equal to K_d. However, for many compounds and sorption media the Freundlich constant has not been determined. For such compounds, the log octanol/water partition coefficient [log (K_{ow})], may be used as an indication of the mobility of a chemical species. The log K_{ow} is equal to the log of the ratio of the concentration of the chemical species dissolved in octanol divided by the concentration of the species dissolved in water. Many of these values have been determined and are published in literature. Large log K_{ow} values indicate that the chemical species has a greater tendency to be sorbed to organic material in soils than dissolved in water.

Log K_{oc} is defined as the log of the ratio of the adsorbed chemical per unit weight of organic carbon to the aqueous solute concentration. This value provides an indication of the tendency of a chemical to partition into organic carbon. Chemicals that sorb strongly to organic carbon (high log K_{oc} values) have characteristically low aqueous solubilities, whereas compounds with low tendencies to sorb to organic carbon (low log K_{oc} values) have high aqueous solubilities. The larger the log K_{oc} value, the greater is the tendency to sorb to soil organic carbon instead of migrating. In addition to organic carbon, sorption to soil is also a function of the surface area of the soil particle, as well as the size, shape, and surface area of the sorbing molecule. These factors are less useful in predicting mobility in most bedrock media owing to the general absence of chemically available organic carbon.

Another important aspect in understanding the fate of organic contaminants in the environment is the ability of the contaminants to partition into the air phase from the soil and water phases. This pathway is significant for certain organic chemicals in the water table, surface water, and surficial soils. The extent to which an organic chemical can volatilize from the soil and water phases depends on its vapor pressure, aqueous solubility, and diffusion coefficient.

Specific behavioral properties of each of the contaminants of concern are provided below. Physical and chemical properties of PCB constituents and lead are provided in Tables 5-1 and 5-2, respectively.

5.2.1.1 PCBs

PCBs are found as various mixtures of chlorinated biphenyls, frequently known by their industrial trade name, Aroclor. With the exception of Aroclor 1016, the Aroclor designations are a reflection of the number of carbon atoms and percent chlorine (e.g., Aroclor 1248 has 12 carbon atoms and is 48 percent chlorine). PCBs are generally oils or resins of low flammability, low aqueous solubility and high organic solubility. They have extremely high K_{ow} and K_{oc} values. The physical and chemical properties of the principal PCBs detected at the site are summarized in Table 5-1.

PCBs are generally very stable in the environment, with more chlorinated mixtures showing greater persistence. The predominant mechanism of environmental cycling is volatilization from water or soil and subsequent wet deposition (ATSDR, 1987; Nisbet & Sarofim, 1972). However, strong adsorption to sediments and organic matter immobilizes PCBs in aquatic systems and limits the potential for partitioning into the water column, where volatilization and bioaccumulation by aquatic organisms can occur. Sediments act as an environmental sink (ATSDR, 1987; USEPA, 1979).

The degree to which PCBs are subject to degradation depends on the degree of chlorination. In water, photolysis of more chlorinated mixtures occurs (Nisbet & Sarofim, 1972), although the extent has not been confirmed (USEPA, 1979). Photolysis does occur in air and is considered a major transformation process. Biodegradation is slow but significant for more chlorinated mixtures in soils/sediments and for less chlorinated mixtures in water; it is probably the only viable degradation mechanism in soils and sediments (ATSDR, 1987). PCBs are resistant to hydrolysis and oxidation in all media (ATSDR, 1987; USEPA, 1979).

High K_{oc} values indicate that PCBs are slow to partition out of sediments into the water column, the primary mobility mechanism in surface water is sediment transport (Nisbet & Sarofim, 1972). Adsorption to sediments is further increased by the presence of high organic carbon or oily materials (USEPA, 1979). High K_{oc} values also indicate a low potential for leaching from soils (ATSDR, 1987).

The mobility of PCBs is expected to be limited especially in fine-grained and organically enriched groundwater systems. Once in bedrock, however, PCBs will migrate due to the relative lack of sorptive sites.

The major fate and transport mechanisms for PCBs are presented in Table 5-3.

5.2.1.2 Lead

Metals (specifically lead for the GM site) are physically stable in the environment, with high melting points and low volatility. Compounds formed by metals may exhibit a wide range of aqueous solubilities and chemical characteristics. The physical and chemical properties of lead are presented in Table 5-3.

The mobility of metals is complex and depends, on the most basic level, on the ratio of the dissolved and solid fractions of the element (Forstner, 1987). Initially, this ratio is influenced by the form in which the element is discharged to the system, but this form is rapidly affected by interactions which take place within the system. The form or species which a metal may take include metals in solution; adsorbed to clays, silicates, and organic materials, bound to organics; and incorporated in crystalline structures (Maest, et al., 1984). A metal will have different fate and transport properties, depending on its species and what conditions it takes to release it from this species to solution.

Once in solution, a metal is bioavailable and, within a surface water system, mobile (Maest, et al., 1984). The distribution of a metal in the water column between different species is affected by the chemical conditions present in the system.

The most important conditions influencing the availability and mobility of metals are pH, oxidation/reduction (redox) potential, the presence of complexing agents, and salinity.

Precipitation and industrial discharge can temporarily change the pH of surface water and increase the availability of metals. Decomposition of organic matter may change the form and the solubility of metallic compounds. Decomposition may occur in aerobic conditions and in anaerobic conditions in the presence of bacteria. Complexing agents, both natural and synthetic, may associate with metals by forming metallic complexes with high solubility (Forstner, 1987), or may form less soluble complexes which effectively remove a metal from solution (Blakely, 1980).

5.2.2 Biogeochemical Processes

5.2.2.1 Groundwater

Chemicals within groundwater will be affected by several factors including volatilization, dilution, sorption, biodegradation, and filtration. Volatilization will serve to reduce concentrations of volatile and some semivolatile organics within the upper groundwater bearing zone. Volatilization is not an important process at the GM site since the contaminants of concern are PCBs and lead.

Groundwater contamination migrating within overburden and bedrock will be subject to dilution, thereby affecting the concentration of organics and inorganics. Dilution occurs from recharge from percolating water, and by virtue of dispersion. Dispersion in porous media occurs due to the tortuous flow paths around soil particles. In fractured bedrock, dispersion occurs when flow from contaminated fractures intercepts relatively clean water in other fractures.

Sorption is a process which will retard migration of contaminants, as previously discussed. This process will occur in the soil, but is generally not a factor in limestone bedrock unless flow occurs through fractures infilled with fine-grained soils. Soil particles and organic carbon within the overburden contain exchange sites allowing contaminants to adhere to them. In general, fine-grained soils (silt and clay) and those with high organic carbon contents, contain a greater number of exchange sites than other soils. Sorption is a reversible process. As such, when a plume passes through clean soil, chemicals will be adsorbed to the soil. But when the concentrations of the contaminants within the plume decrease, desorption of the contaminants from the soil particles can occur, resulting in remobilization of the chemicals to the groundwater.

Adsorption tends to retard or attenuate the plume migration rate, such that certain contaminants appear to travel more slowly than the ambient groundwater. Empirically, adsorption is a function of organic carbon content of the soil and the log octanol water partition coefficient (for organics) or the distribution coefficient (for metals).

Biodegradation of organic compounds will occur as a result of metabolization of certain organics by microbial action. However, this is not an important process since PCBs do not easily biodegrade.

Filtering is another process limiting migration of PCB and lead-contaminated water-borne sediments within the groundwater regime. In the overburden, filtering occurs as groundwater flows around soil particles and thus the soil medium acts as a sieve retaining suspended matter. Filtration is generally greatest at the point of recharge (e.g., ground surface). For the bedrock, filtering of suspended matter occurs along fractures as evidenced by infilling, although in comparison to soil, the bedrock does not provide as much filtration. Fractures infilled with fine-grained soils will also promote filtration of suspended matter.

For the GM site, sorption, adsorption, and filtering appear to be the most important biogeochemical processes affecting lead and PCB migration in groundwater. These processes would all tend to retard migration of contaminants.

5.2.2.2 Surface Water/Stormwater

Surface water contamination will be attenuated by chemical precipitation, settling, dilution, biodegradation, sorption, and volatilization. Precipitation is a process which occurs to ions when they are exposed to oxidizing conditions. Under these conditions, relatively insoluble forms of the metals are formed (hydroxides), resulting in precipitation into sediments.

Settling of suspended solids will also serve to reduce the concentrations of water-borne contaminants. Specifically, as suspended solids travel with surface water, settling will occur, particularly in areas where the velocity decreased (e.g., portion of streams or ponds). If present, contaminated solids will impact the bottom sediments of the surface water body or drainage path.

Dilution in surface water occurs when a volume of contaminated media enters a larger volume of uncontaminated water. Additionally, as contamination migrates in surface water, processes such as eddy diffusion and molecular diffusion result in additional dilution due to velocity variations and concentration gradients.

Volatilization, sorption, and biodegradation in surface water occurs, similar to that described for groundwater. For the GM site, only sorption appears to be an important process for surface water. Specifically, this refers to sorption onto suspended materials transported within the surface water.

5.3 Contaminant Migration

Groundwater and storm water runoff/sediment discharge via the storm sewers are the two mechanisms with potential for transporting contamination off site. These two mechanisms are discussed below.

5.3.1 Groundwater

PCB contamination at the Site is attributable to two separate source areas. Groundwater associated with the first source area is contained in the area around the original clay tile pipe and IRM excavation. This investigation has indicated that PCB contaminated groundwater is not migrating beyond the groundwater collection trench previously installed downgradient of the clay tile pipe. Groundwater associated with the second source area is located in and migrating through the former Scajaquada Creek channel. Based on the difference between PCB concentrations obtained from the east property line (upgradient) and the western end of the site (downgradient), it appears that the source area is located east of the Site on property belonging to parties other than GM. In addition, results of this investigation show that PCBs have not migrated beyond the Site to the main portion of the AAM facility on the west side of the Conrail ROW.

There is lead contamination of groundwater at the site and it is found in the overburden fill materials. Due to the low permeability silty clay layer found consistently across the site, migration is predominantly horizontal as opposed to vertically downward toward the bedrock. Since lead occurs primarily in a sorbed state on colloidal material, movement of lead can be considered minimal. Lead is strongly retained in soils by ion exchange and specific adsorption processes. This is supported by the significant difference between total and dissolved lead concentrations in groundwater. The elevated total lead concentrations are indicative of the turbidity and in turn suspended solids in the groundwater. Dissolved lead concentrations are near non-detectable.

Due to the filtering properties of the overburden, suspended solids are retained by the soil medium to some degree. Since the lead contamination is attributed to the solids in the groundwater, filtering of the solids should minimize migration of lead from the Site. Also, soluble lead would have a tendency to sorb onto fill particles.

5.3.2 Stormwater and Sediment

The facility storm sewer discharge contained both PCBs and lead in the stormwater, as well as in the sewer sediments. Only lead was detected in the water and sediments collected from the Scajaquada Creek Drain.

PCBs are very persistent in the environment, have low aqueous solubilities and have a strong tendency to sorb onto soils and sediments. PCBs are not readily biodegradable and the Aroclors detected at the site are relatively non-volatile. The major transport mechanism is through aqueous transport of contaminated soils as suspended solids.

Lead is primarily present due to the suspended solids and sediments. As with PCBs, the major transport mechanism for lead is through aqueous transport of contaminated suspended solids.

The Site storm sewer system was cleaned in July 1996. As a result, there should be no future potential for contaminants to migrate through the storm sewers into the Scajaquada Creek Drain.

Storm sewer sediments do not present an on-site opportunity for contact by humans or wildlife. They are contained below grade in catch basins that are accessible only through manholes. The manholes are covered by steel grating or manhole covers. The direct pathway is therefore incomplete. However, contaminants in storm sewer sediments may theoretically be transported downstream and ultimately discharge to Scajaquada Creek. This pathway is unlikely to be of environmental significance given the distance from the Site to the creek discharge (approximately 900 feet) and the physical characteristics of the catch basins and the sediment. Furthermore, the Site storm sewers were cleaned to remove any sediments and videotaped to verify the integrity of the lines in July 1996. One damaged section of pipe adjacent to Manhole 1 and the IRM excavation area was repaired in September 1996. As a result of the absence of sediment, sediment transport through the Site storm sewers is an incomplete pathway.

Under current Site conditions, there is no potential for contact with contaminated subsurface soils because the Site is either completely paved or covered with topsoil and landscaping. However, future excavation activities could place workers in direct contact with contaminated soils. Exposure could occur via the following pathways:

- Incidental ingestion of soil containing PCBs and lead.
- Dermal absorption of PCBs from soil.
- Inhalation of contaminated soils suspended as fugitive dust during material storage or excavation.

Dermal exposure of lead is not considered because absorption of inorganics from soil (other than mercury) is negligible. Absorption of inorganic lead via dermal exposure is insignificant compared with the oral and inhalation routes.

6.4 Exposure Assessment

6.4.1 Hypothetical Exposure Scenario

In order to estimate chemical intakes associated with the soil exposure pathways, a theoretical construction scenario was developed. The scenario involves completion of an excavation such as might be required for utility installation or repair. Exposure would be anticipated to be short-term, probably on the order of days. A three-month exposure duration was assumed to be conservative. Other exposure variables are based on published values or standard USEPA assumptions.

6. BASELINE RISK ASSESSMENT

6.1 Introduction and Approach

The purpose of the baseline risk assessment is to characterize the human health and environmental impacts associated with the site in the absence of remedial action. Risks are determined in a multi-step procedure that involves identification of chemicals of potential concern, a pathway evaluation, toxicity assessment, and risk/hazard characterization. The human health risk assessment follows the guidelines set forth in Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part A) and subsequent supplemental guidance (USEPA, 1989 and 1991b). Where available, published values for exposure scenarios and toxicity factors are used.

6.2 Chemicals of Potential Concern

The chemicals of concern for the Site are PCBs and lead. Both are present in subsurface soils and storm sewer sediments. Lead was also identified in unfiltered overburden groundwater above the New York State groundwater standard in six out of ten wells. PCBs are present in oil and groundwater within the zone of capture for the subsurface groundwater collection system, as well as in groundwater in the former Scajaquada Creek channel. The bedrock groundwater well is uncontaminated as confirmed by analysis and validation. Analytical findings were summarized in Section 4.0.

6.3 Pathway Evaluation

The Site is in an urban industrial area. It consists of a paved parking lot and is entirely fenced and patrolled, thereby preventing access by trespassers. All contamination is limited to the subsurface, either in the soils, groundwater or storm sewer catch basins. In addition, a deed restriction limiting the use of the property for industrial purposes only was placed on the property during its conveyance from GM to AAM.

Groundwater, including bedrock groundwater, is not used for potable purposes, as the area is serviced by public water. Furthermore, the overburden formation that is addressed by the IRM is not capable of providing adequate yield for use as a groundwater supply. Bedrock groundwater shows no evidence of contamination. Therefore, the groundwater use pathway is incomplete and does not present a public health risk.

Table 6-1 summarizes the exposure variables, along with specific rationales and references.

6.4.2 Calculation of Representative Maximum Average Soil Concentrations

To calculate the representative subsurface concentration associated with maximum exposure, a 50-foot diameter circle was drawn to encompass the maximum concentrations detected. A future excavation could take any geometry. For the hypothetical purposes of this assessment, a circular shape was assumed. Theoretical excavation zones in the areas of maximum concentration are shown on Sheets 13 and 14. The associated sample identifications and concentrations appear in Table 6-2. All samples within each theoretical excavation were averaged to obtain a representative exposure concentration. All depths were included because the excavation could easily extend as deep as the deepest sample collected (seven feet), and exposure would occur to all material.

For PCBs (Sheet 13), there were two areas with concentrations that were above most sample locations. Representative average concentrations from both were calculated before selecting one to ensure that the highest average concentration area was selected. Area 1 encompassed four samples, averaging 118 mg/kg. Area 2 contained seven samples within its boundary, averaging 129 mg/kg; this concentration was used in the exposure and risk analysis. For lead, (Sheet 14) there was only one area that clearly contained the highest soil concentrations, including BL-21 which, at 28,900 mg/kg, had by far the highest concentration identified. The average lead concentration of the five samples within the vicinity of BL-21 was 7,012 mg/kg.

Table 6-2 shows the calculation of representative maximum average soil concentrations.

6.5 Toxicity Assessment

6.5.1 PCBs

The carcinogenic slope factor (SF) of 7.7 $(mg/kg\text{-}day)^{-1}$ for PCBs was obtained from the USEPA Integrated Risk Information System (IRIS) database. The USEPA does not have a noncarcinogenic reference dose (RfD) for PCBs. However, the Massachusetts Department of Environmental Protection (MADEP) has developed a value using the same methodology that the USEPA uses in deriving RfDs. MADEP used a Lowest Observed Adverse Effect Level (LOAEL) of 0.005 mg/kg-day obtained from a chronic exposure study in monkeys and applied a ten-fold uncertainty factor (UF) based on extrapolation from LOAEL to No Observed Adverse Effect Level (NOAEL), a UF of ten to extrapolate from animals to humans, and an additional UF of ten to protect sensitive subpopulations. The resulting RfD is 5×10^{-6} mg/kg-day. This value was used to assess noncarcinogenic endpoints in the risk assessment. MADEP uses a similar value for inhalation ($6x10^{-6}$ mg/kg-day, MADEP, 1994)

The Sf is for oral exposure and are based on administered dose. There are no toxicity factors for inhalation or dermal exposure. Therefore, the oral values were used for all three exposure routes. Although there is uncertainty in using an oral toxicity factor for other exposure routes, the alternative is to omit these pathways entirely from consideration. Therefore, using the oral values is a conservative approach.

No adjustment of the toxicity factors based on relative absorption was made. Absorption via the oral route is believed to be high (probably nearly complete). Inhalation absorption has been well documented, however, and is likely to also be high (ATSDR, 1991), but no ratio between the oral and inhalation pathways can be developed because the extent of inhalation absorption is unknown. It was assumed therefore that absorption through both routes is comparable. Using unadjusted toxicity factors for inhalation prevents lowering of the SF and associated potential underestimation of risk.

Absorption through dermal exposure is generally lower than through oral exposure. This difference, however, need not be accounted for in the SF because dermal exposure is calculated as an absorbed dose.

6.5.2 Lead

The USEPA has determined that development of toxicity factors for lead is inappropriate. Therefore, risks through lead cannot be evaluated using standard risk assessment methodology. An alternate approach based on occupational exposure was used, as specified in the Work Plan (Wehran EMCON Northeast, 1994). This approach, which is described in Section 6.6.2, relies on the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL) for lead of 50 ug/m^3.

6.6 Exposure and Risk Evaluation for PCBs

6.6.1 Estimation of Intakes

Daily PCB intakes through the dermal contact and incidental ingestion exposure pathways appear on Figures 6-1 and 6-2, respectively.

In order to calculate exposure through inhalation, a simple model was used to estimate the ambient concentration of dust that might be generated during excavation. The model is based on stockpiling of a storage pile. Variables assumed in the model appear in Table 6-3, and the model equation and calculation are shown on Figure 6-3. The model generates an emission estimate in mass per area per time. To convert this emission rate to an ambient concentration, a suspension factor from the New York State Air Guide was used. The suspension factor is a screening tool that provides a highly conservative estimate of ambient concentration based on emission rate.

The estimation of PCB intake through inhalation of ambient fugitive dust is shown on Figure 6-4.

6.6.2 Estimation of Risks

Carcinogenic risks through exposure to PCBs via dermal contact, ingestion, and inhalation are shown on Figure 6-5. The overall multipathway carcinogenic risk is the sum of the risks through all pathways. This risk was estimated at 9×10^{-6}. Most of the risk was due to dermal contact (7×10^{-6}), although ingestion also contributed significantly (2×10^{-6}). Risk through inhalation was negligible (9×10^{-10}). Typically, 10^{-6} to10^{-4} is the maximum acceptable risk range. The carcinogenic risk associated with the Site falls within the acceptable range.

Estimated noncarcinogenic hazards are shown in Figure 6-6. A Hazard Quotient (HQ) above 1 represents unacceptable hazard. The HQs for dermal contact and ingestion were estimated at 50 and 10, respectively. As with carcinogenic risk, the inhalation pathway did not contribute significantly to overall risk (2×10^{-5}). The multipathway noncarcinogenic hazard was calculated at 60. Based on the hypothetical exposure scenario, mitigative measures to minimize contact would be required. In the hypothetical construction scenario, mitigative measures would include the use of personal protective equipment to prevent dermal contact and ingestion.

6.7 Exposure and Risk Evaluation for Lead

6.7.1 Calculation of Intakes

Daily intakes for lead through the incidental ingestion and inhalation pathways are shown on Figures 6-7 and 6-8, respectively. Inhalation intake is based on the ambient dust concentration described in Section 6.6.1 and shown on Figure 6-3.

6.7.2 Calculation of Risks

As discussed in Section 6.5.2, there are no toxicity factors for lead. In order to evaluate the acceptability of potential site exposure, a hazard quotient was developed using the intake that would be experienced at the OSHA PEL rather than using an RfD. The PEL is a regulatory value that represents acceptable occupational exposure. Since the PEL is an ambient air measurement, the OSHA PEL intake was calculated assuming that a worker would be exposed over an eight-hour workday. This calculation is shown on Figure 6-9.

The hazard through lead exposure was expressed as a ratio between the intake at the OSHA PEL and site intake (Figure 6-10). Because intake was also assumed to occur via incidental ingestion, this approach is more conservative than simply comparing the estimated ambient lead concentration directly to the PEL. The hazard was estimated at 0.4, below 1. This indicates that lead does not represent an unacceptable risk at the Site.

6.8 Environmental Evaluation

The Site is located in an urban/industrial area. The PCB and lead contamination identified and described in this investigation is confined to the subsurface. Therefore, there is limited potential for environmental impacts. Under current site conditions, pathways associated with soil contamination are incomplete. However, as discussed in Section 6.3, future excavation activities could present an opportunity for direct contact between animals and soils. As with humans, exposure could occur via incidental ingestion of soil, dermal absorption of PCBs from soil, and inhalation of contaminated soils suspended as fugitive dust during material storage or excavation.

There is no potential for human or wildlife contact with contaminated groundwater outside of the containment area. The potential soil contact pathways do not represent a significant environmental risk for the following reasons:

- Soils would only be exposed on a short-term basis, and any contact between exposed soils and wildlife would be transient.
- Due to the nature of the Site area, there is little or no wildlife. Species present would not be sensitive.

No overall environmental hazard is anticipated associated with soils or groundwater.

As discussed in Section 6.3, sediment transport through the Site storm sewers is an incomplete pathway since the sewers were cleaned on July 1996 to remove any sediment. Any potential sediments present in the catch basins in the future do not represent a potential for direct contact, as the material would be below grade. The basins are covered and only accessible via manholes. However, there is flow from the storm sewer system into the Scajaquada Creek Drain; stormwater from the Site discharges to the creek drain to the south of the Site. Scajaquada Creek reemerges as an aboveground, Class B stream approximately 2 miles from the Site. The creek ultimately discharges into the Black Rock Canal, a Class C stream, approximately 6.7 miles from the Site.

The off-site sediment transport pathway would therefore be theoretically complete. It would, however, likely be of minimal environmental significance for the following reasons:

- The geometry of the basins is such that sediment would lie below the level at which water typically flows. So long as catch basins are periodically maintained, each catch basin would act as a sediment sink, which would inhibit sediment migration to the outfall.
- Scajaquada Creek is a man-made underground drainage channel adjacent to the Site. There is therefore no biological community.
- Because of the distance between the Site discharge to the Scajaquada Creek Drain and the reemergence of Scajaquada Creek as an above-ground, Class B stream (on the order of two miles), only a very small fraction of the sediment that did end up in the drain would ultimately be transported to the Creek. This indicates that the potential for site-related material to reach a point of ecological concern is very small.
- As discussed above, the urban/industrial nature of the area limits the variety and sensitivity of wildlife present.

Overall, therefore, environmental impacts associated with the Site are likely to be minimal.

6.9 Summary and Conclusions

Human health risks were evaluated for direct contact with soils. The pathway is currently incomplete, but could become complete under a future excavation scenario. Dermal contact, incidental ingestion and inhalation of fugitive dust were included. Workers exposed to PCBs in subsurface materials would experience an excess lifetime carcinogenic risk of 9×10^{-6}, which is within the range of typically acceptable risks. The multipathway hazard index (HI) for PCB exposure was estimated at 60, which indicates unacceptable hazard. However, because the only exposure pathway that is theoretically complete is a hypothetical occupational exposure, commonly available personal protective equipment and other engineering controls would be used to address this hypothetical hazard.

Lead hazard was assessed by calculating an HI using the intake that would be experienced under OSHA PEL of 50 ug/m^3 as an acceptable intake. The HI, based on incidental ingestion and inhalation exposure, was estimated at 0.4, below 1. This indicates that lead exposure does not represent an unacceptable occupational risk at the Site.

Environmental hazard associated with exposed soils at the Site is likely to be minimal given the low potential for exposed material and the low probability of wildlife presence. Transport of contaminated sediments from the storm sewer system to off-site surface water may potentially occur, however, this is not currently a concern since the Site storm sewers were cleaned of sediment in July 1996. Given the distance to an area of ecological concern, potential future impacts are anticipated to be insignificant.

7. SUMMARY AND CONCLUSIONS

7.1 Summary

A field investigation program was completed at the former GM Saginaw Buffalo Facility to further characterize site conditions and the nature and extent of contamination at the Site. This investigation consisted of the excavation of test pits; the drilling of borings and installation of monitoring wells; and sampling and analysis of soil, sediment, and water. The data obtained from this investigation was utilized to support the completion of a baseline risk assessment.

The work performed addresses two operable units. The first Operable Unit, OU-1, is for PCBs. The apparent source of PCBs is associated with the clay tile pipe at the Site. A second source area has been identified as a result of this investigation. This source is believed to be located to the east of the Site, on property belonging to parties other than GM. The second Operable Unit, OU-2, is for lead which is associated with the "ash-like" fill materials at the Site.

A summary of the findings and conclusions of the investigation is provided below.

7.1.1 Site Geology/Hydrogeology

The geologic conditions across the Site are relatively consistent. In general, the Site is covered by an asphalt parking lot. Beneath the parking lot in order of increasing depth are a layer of heterogeneous fill comprised of ash, slag, sand, and miscellaneous debris (e.g., coal, brick); a discontinuous organic silt layer; a continuous native red silty clay layer; and limestone bedrock.

Groundwater is first encountered in the fill layer. Groundwater across the Site ranges in depth from three to four feet below ground surface and flows in a generally southerly direction toward the former Scajaquada Creek channel, consistent with the areal drainage pattern.

Groundwater also resides within the bedrock. The continuous native silty clay layer between the fill materials and bedrock acts as a low permeability barrier preventing significant downward migration of groundwater flow from the fill to the bedrock groundwater system.

7.1.2 Nature and Extent of Contamination

A summary of the analytical results by operable unit and medium are provided below.

Operable Unit 1

PCB contamination at the Site is attributable to two source areas. The first source area impacts soil in the saturated zone and is primarily localized in the area of the original clay tile pipe and IRM excavation, south of the WWTP. Concentrations range from 0.027 mg/kg to 180 mg/kg. Most of the contamination is contained within the boundaries of the groundwater collection trench. The only exceptions are soils in the vicinity of the reclaimed oil storage tank containment area.

Likewise, groundwater PCB contamination attributable to this source is contained in the area around the original clay tile pipe and IRM excavation. The groundwater contamination, present as PCB Aroclors 1248 and 1260, is localized within the boundaries of the groundwater collection trench. There is no PCB contamination of the bedrock groundwater. The overlying native silty clay layer acts as a protective barrier against downward migration of contaminants.

PCBs are also present in the sediment of the storm sewer system at the Site at concentrations ranging from 0.67 mg/kg to 31 mg/kg. PCBs are not present in sediment or water from the Scajaquada Creek Drain.

The second source of PCB contamination affects the former Scajaquada Creek channel. PCB concentrations in soil were detected at 12.1 mg/kg at the east property line of the Site. PCB concentrations in groundwater ranged from 2.9 ug/l at MW-206 at the east property line to 0.3 ug/l at MW-203.

Operable Unit 2

Lead contamination is present in the fill materials across the Site at concentrations ranging from 3 mg/kg to 14,000 mg/kg. This contamination is not localized, but rather is randomly distributed across the Site and is attributable to the "ash-like" fill.

Total lead levels are slightly elevated in the shallow groundwater at the Site, with concentrations ranging from 0.001 to 0.250 mg/l, while dissolved lead concentrations ranged from 0.001 to 0.005 mg/l. As with the soils, due to the heterogeneous nature of the fill, it is impossible to attribute any pattern to the lead distribution in the groundwater. Based on the disparity between the total and dissolved lead concentrations, it can be concluded that lead contamination in the groundwater is attributable to the suspended materials, most likely from the fill materials in the immediate vicinity of the monitoring wells. There is no lead contamination of the bedrock groundwater. The overlying native silty clay layer acts as a protective barrier against downward migration of contaminants.

Lead was present in the storm sewer sediments at concentrations ranging from 92 to 360 mg/kg, and to a lesser degree in the storm water at concentrations ranging from 0.001 to 0.014 mg/l. Lead was also present in sediment from the Scajaquada Creek Drain at concentrations ranging from 51.1 to 171 mg/kg and in the water at concentrations ranging from 0.0014 to 0.0027 mg/l.

7.1.3 Fate and Transport

7.1.3.1 Potential Routes of Migration

Groundwater

The shallow groundwater pathway is the primary route of migration. Migration occurs horizontally in the overburden fill materials at the Site. Hydraulic head distributions in the overburden indicate a horizontal gradient to the south. The magnitude of groundwater velocities in the overburden fill material is estimated to be on the order of 72 feet per year. The ultimate discharge is to the former Scajaquada Creek channel.

Storm Sewers

Surface water runoff from the Site is intercepted by storm sewer basins throughout the site and is carried to the Scajaquada Creek Drain. Once in the drain, runoff is discharged to Scajaquada Creek.

7.1.3.2 Contaminant Transport

Groundwater

PCB contamination of the groundwater attributable to the first source (the clay tile pipe) is contained in the area around the original clay tile pipe and IRM excavation and is not migrating beyond the groundwater collection trench. A second source area, believed to be located on property east of the Site, has resulted in PCB-contaminated groundwater migrating through the former Scajaquada Creek channel. This contamination appears to be confined to the Site in the downgradient direction.

Lead in the groundwater at the site is concentrated in the overburden fill materials. Due to the low permeability silty clay layer found consistently across the site, migration is predominantly horizontal as opposed to vertically downward toward the bedrock. Since lead occurs primarily in a sorbed state on solid material, movement of lead can be considered minimal. This is supported by the significant difference between lead concentrations in filtered and unfiltered groundwater. The elevated lead concentrations in unfiltered samples are indicative of suspended solids in the groundwater. Lead concentrations in filtered samples are at or near non-detectable.

The fill materials cannot be viewed as a source of groundwater contamination. The potential for off-site migration of lead is limited to the potential for solids to migrate through the fill matrix. This is considered minimal.

Storm Sewers

The Site storm sewer discharge contained both PCBs and lead in the sediments. The major transport mechanism for both contaminants is believed to be through aqueous transport of contaminated sediments. Since the Site storm sewers were cleaned of sediments in July 1996, this pathway is considered incomplete.

7.1.4 Risk Assessment

Based on the baseline risk assessment, the Site does not pose a hazard to human health and the environment in its current condition. Exposure that could theoretically result in a health hazard is limited to hypothetical occupational exposure if PCB-contaminated soils were encountered during subsurface excavation. These hazards can be routinely addressed through standard health and safety protocols.

7.2 Conclusions

Based on the investigation completed at the Site, the following can be concluded:

- The nature and extent of PCB and lead contamination have been adequately characterized.
- The potential risks to human health and the environment have been identified. Based on the baseline risk assessment, the Site does not pose a hazard to human health and the environment in its current condition.
- The available database from the investigation conducted provides sufficient characterization for the development of remedial action objectives and the evaluation of remedial alternatives.

Pursuant to the Work Plan, the Engineering Evaluation of Alternatives will be prepared and submitted to NYSDEC after NYSDEC approval of this SI report.

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REFERENCES

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TABLES

Table 2-1
GENERAL MOTORS CORPORATION
PCB FIELD SCREENING RESULTS

CLAY TILE PIPE REMOVAL: Screen for 50 ppm

SAMPLE	INTERVAL (ft.)	NWT-A	NWT-B	NWT-C	NWT-D	NWT-E	SET-A	SET-B	SET-C	SET-D	SET-E
1	0-2	>50	>50	<50	<50	<50	<50	<50	<50	<50	<50
2	2-4	<50	>50	<50	<50	<50	<50	>50	<50	<50	>50
3	4-6	>50	>50	>50	>50	>50	<50	<50	<50	>50	>50

BORING / WELL INSTALLATION: Screen for 2 ppm

SAMPLE	INTERVAL (ft.)	BL-95-2	BL-95-3	BL-95-4	RW-95-1	MW-200
S-1	0-2	<2	<2	<2	>2	<2
S-2	2-4	<2	<2	<2	<2	<2
S-3	4-6	<2	<2	<2	CL	<2
S-4	6-8	CL	CL	CL	CL	<2

NOTES: Field screening performed using Ensys PCB Screening Kit.
NWT - Northwest Trench wall
SET - Southeast Trench wall
MW - Monitoring well
BL - Boring location
RW - Rock well
CL denotes native clay encounted - no field screening performed.

Table 2-2
GENERAL MOTORS CORPORATION
SUMMARY OF MONITORING WELL INSTALLATIONS

WELL NUMBER	GROUND SURFACE ELEVATION	MONITORING POINT ELEVATION	SCREENED INTERVAL				SAND PACK INTERVAL				BENTONITE SEAL INTERVAL			
			DEPTH		ELEVATION		DEPTH		ELEVATION		DEPTH		ELEVATION	
			from	to	from	to	from	to	from	to	from	to	from	to
MW-200	644.16	643.91	4.1	8.1	636.06	640.06	3.5	8.1	636.06	640.66	2.2	3.5	640.66	641.96
MW-201	647.65	647.30	4.0	9.0	638.65	643.65	3.5	9.0	638.65	644.15	1.9	3.5	644.15	645.75
MW-202	640.39	639.91	4.0	8.0	632.39	636.39	3.5	8.5	631.89	636.89	2.5	3.5	636.89	637.89
MW-203	640.26	640.11	4.5	9.5	630.76	635.76	4.0	10.0	630.26	636.26	2.5	4.0	636.26	637.76
MW-204	644.87	644.59	4.0	7.5	637.37	640.87	3.5	8.0	636.87	641.37	2.0	3.5	641.37	642.87
MW-205	642.37	642.03	2.5	6.5	635.87	639.87	2.1	7.0	635.37	640.27	1.2	2.1	640.27	641.17
MW-206	640.62	640.21	5.5	10.5	630.12	635.12	4.5	10.9	629.72	636.12	3.0	4.5	636.12	637.62
MW-207	641.63	641.24	4.0	9.0	632.63	637.63	3.2	10.0	631.63	638.43	1.2	3.2	638.43	640.43
RW-95-1	644.55	646.22	19.3	27.3	617.25	625.25	18.3	27.8	616.75	626.25	16.0	19.3	625.25	628.55
MW-1	646.80	649.82	3.5	8.5	638.30	643.30	3.0	9.2	637.60	643.80	2.0	3.0	643.80	644.80
MW-5	644.14	645.88	4.2	9.5	634.64	639.99	4.0	10.0	634.14	640.19	3.0	4.0	640.19	641.14

NOTE: All depths and elevations are measured in feet. Elevations are referenced to the NVGD datum.

Table 2-3
GENERAL MOTORS CORPORATION
WELL DEVELOPMENT SUMMARY

WELL	WELL DEPTH (ft)	WATER VOLUME REMOVED (gal)	NUMBER OF WELL VOLUMES	TURBIDITY (ntu)
MW-200	8.1	20	29	>200
MW-201	9	1.5	9	>200
MW-202	8.5	19	35	173
MW-203	10	22.5	28	47
MW-204	8	7.5	10	>200
MW-205	7	8.1	8	>200
MW-206	10.9	12.3	12	>200
MW-207	10	16	10	>200
RW-95-1	27.8	38	33	45

Table 2-4
GENERAL MOTORS CORPORATION
WATER LEVEL ELEVATIONS

	GROUND	TOC	4/3/95			4/6/95			4/11-12/95			4/14/95		
WELLS	ELEV.	ELEV.	WL	WL ELEV.	BGS	WL	WL ELEV.	BGS	WL	WL ELEV.	BGS	WL	WL ELEV.	BGS
MW-200	644.16	643.91	3.19	640.72	3.44	3.18	640.73	3.43	3.15	640.76	3.40			
MW-201	647.65	647.30	6.26	641.04	6.61	6.27	641.03	6.62	6.27	641.03	6.62			
MW-202	640.39	639.91	4.13	635.78	4.61	4.16	635.75	4.64	4.15	635.76	4.63			
MW-203	640.26	640.11	3.04	637.07	3.19	3.06	637.05	3.21	3.02	637.09	3.17			
MW-204	644.87	644.59	2.50	642.09	2.78	2.55	642.04	2.83	2.52	642.07	2.80			
MW-205	644.37	644.03												
MW-206	642.62	642.21												
MW-207	643.63	643.24												
RW-95-1	644.55	646.22	21.45	624.77	19.78	21.49	624.73	19.82	21.40	624.82	19.73			
MW-1	646.8	649.82	6.59	643.23	3.57	6.63	643.19	3.61				6.60	643.22	3.58
MW-2	643.65	647.10	4.19	642.91	0.74	4.17	642.93	0.72				4.00	643.10	0.55
MW-3A	642.39	646.09	7.65	638.44	3.95	8.80	637.29	5.10				8.80	637.29	5.10
MW-4	641.07	644.22	10.99	633.23	7.84	11.38	632.84	8.23				11.30	632.92	8.15
MW-5	644.14	645.88	5.28	640.60	3.54	5.28	640.60	3.54				4.88	641.00	3.14

Notes:

All measurements are in feet. Elevations are referenced to the NVGD datum.
TOC - Top of inner casing
BGS - Below ground surface

Table 2-4
GENERAL MOTORS CORPORATION
WATER LEVEL ELEVATIONS

	4/17/95			4/18/95			4/20/95			4/21/95			4/24/95		
WELLS	WL	WL ELEV.	BGS	WL	WL ELEV.	BGS	WL	WL ELEV.	BGS	WL	WL ELEV.	BGS	WL	WL ELEV.	BGS
MW-200	3.07	640.84	3.32	3.08	640.83	3.33	3.11	640.80	3.36	3.13	640.78	3.38	3.14	640.77	3.39
MW-201	6.22	641.08	6.57	6.22	641.08	6.57	6.32	640.98	6.67	6.25	641.05	6.60	6.28	641.02	6.63
MW-202	4.10	635.81	4.58	4.10	635.81	4.58	4.18	635.73	4.66	4.16	635.75	4.64	4.19	635.72	4.67
MW-203	3.14	636.97	3.29	3.07	637.04	3.22	NA			NA			3.21	636.90	3.36
MW-204	2.57	642.02	2.85	2.60	641.99	2.88	NA			NA			2.66	641.93	2.94
MW-205															
MW-206															
MW-207															
RW-95-1	21.42	624.80	19.75	21.41	624.81	19.74	21.52	624.70	19.85	21.35	624.87	19.68	21.45	624.77	19.78
MW-1	6.38	643.44	3.36	6.40	643.42	3.38	6.47	643.35	3.45	6.03	643.79	3.01	6.51	643.31	3.49
MW-2	4.19	642.91	0.74	NA			NA			NA			3.66	643.44	0.21
MW-3A	7.49	638.60	3.79	NA			NA			NA			8.71	637.38	5.01
MW-4	11.35	632.87	8.20	NA			NA			NA			11.39	632.83	8.24
MW-5	4.87	641.01	3.13	4.85	641.03	3.11	NA			NA			4.91	640.97	3.17

Table 2-4
GENERAL MOTORS CORPORATION
WATER LEVEL ELEVATIONS

	10/18/96			10/25/96			10/29/96		
WELLS	WL	WL ELEV.	BGS	WL	WL ELEV.	BGS	WL	WL ELEV.	BGS
MW-200	NA			2.59	641.32	2.84	2.75	641.16	3.00
MW-201	11.87	641.23	6.42	11.50	641.60	6.05	11.61	641.49	6.16
MW-202	3.80	636.11	4.28	3.32	636.59	3.80	3.57	636.34	4.05
MW-203	3.15	636.96	3.30	2.53	637.58	2.68	2.62	637.49	2.77
MW-204	3.14	641.45	3.42	2.64	641.95	2.92	2.69	641.90	2.97
MW-205	0.42	641.61	0.76	0.21	641.82	0.55	0.30	641.73	0.64
MW-206	3.95	636.26	4.36	3.51	636.70	3.92	3.76	636.45	4.17
MW-207	3.94	637.30	4.33	3.61	637.63	4.00	3.76	637.48	4.15
RW-95-1	21.45	624.77	19.78	21.15	625.07	19.48	21.45	624.77	19.78
MW-1	7.57	642.25	4.55	7.13	642.69	4.11	7.18	642.64	4.16
MW-2	4.42	642.68	0.97	4.09	643.01	0.64	4.25	642.85	0.80
MW-3A	8.75	637.34	5.05	7.87	638.22	4.17	7.63	638.46	3.93
MW-4	6.03	638.19	2.88	4.16	640.06	1.01	4.76	639.46	1.61
MW-5	5.14	640.74	3.40	4.82	641.06	3.08	4.88	641.00	3.14

Table 2-5
GENERAL MOTORS CORPORATION
HYDRAULIC CONDUCTIVITY AND VELOCITY

ASH FILL

LOCATION	HYDRAULIC CONDUCTIVITY	ln(K)
	(cm/sec)	
MW-201	4.14E-04	-7.78964458
MW-202	8.70E-03	-4.74443225
MW-204	1.13E-03	-6.78553765
MW-205	7.15E-03	-4.94106259
		-24.2606771
Geometric mean: mean ln(K)		-6.06516927
exp[mean ln(K)] (cm/sec)		2.32E-03
Gradient		0.009
	Velocity*: (ft/yr)	72

NOTES:

* Assumes a porosity for the fill of 30 percent.
MW-200 was not tested.

SCAJAQUADA CREEK CHANNEL

LOCATION	HYDRAULIC CONDUCTIVITY	ln(K)
	(cm/sec)	
MW-203*	2.27E-02	-3.78759543
MW-206*	1.97E-02	-3.92815239
MW-207*	1.64E-02	-4.10937699
		-11.8251248
Geometric mean: mean ln(K)		-3.94170827
exp[mean ln(K)] (cm/sec)		1.94E-02
Gradient		0.0035
	Velocity**: (ft/yr)	234

NOTES:

* MW-203, MW-206, and MW-207 are located in the former Scajaquada Creek channel.
** Assumes a porosity for the fill of 30 percent.

Table 3-1
GENERAL MOTORS CORPORATION
STRATIGRAPHIC SUMMARY OF RECENT INVESTIGATIONS (MARCH 1995 AND JULY/SEPTEMBER 1996)

BORING NUMBER	GROUND SURFACE ELEVATION	TOTAL DEPTH OF BORING	TOP OF ASH FILL		TOP OF GENERAL FILL		TOP OF ORGANIC SILT		TOP OF NATIVE CLAY		TOP OF BEDROCK		BOTTOM OF BORING ELEVATION
			DEPTH	ELEV	DEPTH	ELEV	DEPTH	ELEV	DEPTH	ELEV	DEPTH	ELEV	
BL-95-1	645.41	10.25	0.5	644.91	2.0	643.41	--	--	--	--	--	--	635.16
BL-95-2	645.63	10.0	--	--	0.0	645.63	--	--	8.0	637.63	--	--	635.63
BL-95-3	641.68	6.0	--	--	0.0	641.68	--	--	5.0	636.68	--	--	635.68
BL-95-4	642.65	8.0	--	--	0.0	642.65	--	--	5.7	636.95	--	--	634.65
BL-95-5	646.14	8.0	2.0	644.14	--	--	6.2	639.94	7.75	638.39	--	--	638.14
BL-95-6	640.40	8.0	0.5	639.90	--	--	--	--	6.0	634.40	--	--	632.40
BL-95-7	637.69	6.0	--	--	0.5	637.19	--	--	4.0	633.69	--	--	631.69
BL-95-8	639.50	10.0	1.8	637.70	--	--	4.0	635.50	8.0	631.50	--	--	629.50
BL-95-9	640.33	11.0	1.0	639.33	--	--	5.0	635.33	9.0	631.33	--	--	629.33
BL-95-10	643.63	7.0	--	--	1.0	642.63	5.0	638.63	6.0	637.63	--	--	636.63
BL-95-11	644.25	7.0	1.0	643.25	--	--	3.0	641.25	5.5	638.75	--	--	637.25
BL-95-12	642.50	7.0	1.0	641.50	1.2	641.30	--	--	6.8	635.70	--	--	635.50
BL-95-13	640.27	10.0	0.35	639.92	--	--	7.8	632.47	8.0	632.27	--	--	630.27
BL-95-14	640.89	7.0	1.0	639.89	--	--	--	--	3.0	637.89	--	--	633.89
BL-95-15	643.06	7.0	1.0	642.06	--	--	--	--	2.75	640.31	--	--	636.06
BL-95-16	638.38	6.0	1.8	636.58	2.25	636.13	--	--	5.1	633.28	--	--	632.38
BL-96-1	640.59	10.85	4.0	636.59	0.5	640.09	10.0	630.59	10.2	630.39	--	--	629.74
BL-96-2	640.47	8.0	0.5	639.97	--	--	4.0	636.47	6.5	633.97	--	--	632.47
BL-96-3	641.40	6.0	--	--	0.25	641.15	--	--	4.75	636.65	--	--	635.40
BL-96-4	641.53	8.0	--	--	0.25	641.28	--	--	4.0	637.53	--	--	633.53
BL-96-5	641.88	8.0	--	--	0.25	641.63	--	--	2.0	639.88	--	--	633.88
BL-96-6	642.60	6.0	--	--	0.25	642.35	--	--	5.0	637.60	--	--	636.60
BL-96-7	642.63	8.0	--	--	0.25	642.38	6.0	636.63	6.25	636.38	--	--	634.63
MW-200	644.16	8.0	--	--	0.0	644.16	--	--	7.25	636.91	--	--	636.16
MW-201	647.65	9.0	--	--	1.0	646.65	7.75	639.90	8.0	639.65	--	--	638.65
MW-202	640.39	8.5	4.0	636.39	--	--	6.0	634.39	7.5	632.89	--	--	631.89
MW-203	640.26	10.0	1.0	639.26	--	--	5.0	635.26	9.0	631.26	--	--	630.26
MW-204	644.87	8.0	0.0	644.87	--	--	6.0	638.87	6.6	638.27	--	--	636.87
MW-205	642.37	7.0	0.5	641.87	--	--	4.0	638.37	2.0	640.37	--	--	635.37
MW-206	640.62	10.9	5.0	635.62	0.5	640.12	10.25	630.37	10.45	630.17	--	--	629.72
MW-207	641.63	10.0	--	--	0.5	641.13	5.7	635.93	7.0	634.63	--	--	631.63
RW-95-1	644.55	27.8	5.0	639.55	1.0	643.55	6.0	638.55	6.25	638.30	17.4	627.15	616.75

Table 3-2
GENERAL MOTORS CORPORATION
STRATIGRAPHIC SUMMARY OF PREVIOUS INVESTIGATIONS (1987-1994)

BORING NO.	GROUND SURFACE ELEV.	TOP OF ASH FILL			TOP OF GENERAL FILL			TOP OF SAND			TOP OF ORGANIC SILT			TOP OF NATIVE CLAY			TOP OF TILL		TOP OF BEDROCK		BORING DEPTH	BORING BOTTOM ELEV.
		DEPTH	ELEV.	THICKNESS	DEPTH	ELEV.	THICK.	DEPTH	ELEV.	THICK.	DEPTH	ELEV.	THICK.	DEPTH	ELEV.	THICK.	DEPTH	ELEV.	DEPTH	ELEV.		
BI-01	646.07	4.0	642.07	4.0	0.5	645.57								8.0	638.07						10.0	636.07
BI-02	645.21	0.5	644.71	6.0							6.5	638.71	0.50	7.0	638.21						8.0	637.21
BI-03	645.16	0.5	644.66	6.0										6.5	638.66						8.0	637.16
BI-04	645.22	2.0	643.22	5.0							7.0	638.22	0.50	7.5	637.72						8.0	637.22
BI-05	645.05	3.8	641.25	1.7				2.0	643.1	1.8	5.5	639.55	0.70	6.2	638.85						8.0	637.05
BI-06	644.82	2.3	642.52	2.7				2.0	642.8	0.3	5.0	639.82	2.50	7.5	637.32						8.0	636.82
BI-07	645.14	1.5	643.64	5.5	0.5	644.64	1.0				7.0	638.14	0.50	7.5	637.64						8.0	637.14
BI-08	644.87	0.5	644.37	6.5							7.0	637.87	1.00	8.0	636.87						8.0	636.87
BI-09	644.57	2.0	642.57	5.0	0.5	644.07	1.5				7.0	637.57	1.00	8.0	636.57						8.0	636.57
BI-10	644.87	2.0	642.87	5.0	0.5	644.37	1.5				7.0	637.87	0.50	7.5	637.37						8.0	636.87
BI-11	644.24	2.0	642.24	4.0	0.5	643.74	1.5				6.0	638.24	1.00	7.0	637.24						8.0	636.24
BI-12	644.21	2.0	642.21	5.0	0.5	643.71	1.5							7.0	637.21						8.0	636.21
BI-13	644.42	4.0	640.42	2.5	0.5	643.92	3.5				6.5	637.92	0.50	7.0	637.42						8.0	636.42
BI-14	644.12	1.0	643.12	4.8	0.5	643.62	0.5				5.8	638.32	0.20	6.0	638.12						6.0	638.12
BI-15	644.00	1.0	643.00	4.3	0.5	643.50	0.5				5.3	638.70	0.70	6.0	638.00						6.0	638.00
BI-16	643.70	0.5	643.20	6.0							6.5	637.20	0.30	6.8	636.90						8.0	635.70
BL-17	643.63	0.5	643.13	4.5							5.0	638.63	0.50	5.5	638.13						6.0	637.63
BI-18	643.69	0.5	643.19	3.8										4.3	639.39						6.0	637.69
BI-19	645.16	4.0	641.16	2.8	0.0	645.16	4.0				6.8	638.36	0.50	7.3	637.86						8.0	637.16
BI-20	644.71	2.0	642.71	5.0	0.5	644.21	1.5							7.0	637.71						8.0	636.71
BI-21	644.78	0.5	644.28	6.3							6.8	637.98	1.20	8.0	636.78						8.0	636.78
BI-22	644.58	0.5	644.08	6.5										7.0	637.58						8.0	636.58
BI-23	644.25	0.5	643.75	5.3							5.8	638.45	0.20	6.0	638.25						6.0	638.25
BL-24	644.65	0.5	644.15	6.5										7.0	637.65						8.0	636.65
BL-25	644.30	2.0	642.30	5.0	0.5	643.80	1.5				7.0	637.30	1.00	8.0	636.30						8.0	636.30
BL-26	642.61	0.5	642.11	4.0										4.5	638.11						6.0	636.61
BL-27	642.67	0.5	642.17	2.5							3.0	639.67	0.50	3.5	639.17						4.0	638.67
BL-28	642.95	1.0	641.95	2.5	0.5	642.45	0.5				3.5	639.45	0.30	3.8	639.15						4.0	638.95
BL-29	643.27	0.5	642.77	2.5							3.0	640.27	0.50	3.5	639.77						4.0	639.27
BL-30	643.99	1.0	642.99	3.5	0.5	643.49	0.5				4.5	639.49	0.50	5.0	638.99						6.0	637.99
BL-31	644.24	1.0	643.24	5.0	0.5	643.74	0.5				6.0	638.24	0.70	6.7	637.54						8.0	636.24
BL-32	645.21	0.5	644.71	3.0	3.5	641.71	3.5							7.0	638.21						8.0	637.21
BL-33	645.17	2.0	643.17	3.0	0.5	644.67	1.5				5.0	640.17	0.50	5.5	639.67						6.0	639.17

Table 3-2
GENERAL MOTORS CORPORATION
STRATIGRAPHIC SUMMARY OF PREVIOUS INVESTIGATIONS (1987-1994)

BORING NO.	GROUND SURFACE ELEV.	TOP OF ASH FILL			TOP OF GENERAL FILL			TOP OF SAND			TOP OF ORGANIC SILT			TOP OF NATIVE CLAY			TOP OF TILL		TOP OF BEDROCK		BORING DEPTH	BORING BOTTOM ELEV.
		DEPTH	ELEV.	THICKNESS	DEPTH	ELEV.	THICK	DEPTH	ELEV.	THICK	DEPTH	ELEV.	THICK	DEPTH	ELEV.	THICK	DEPTH	ELEV	DEPTH	ELEV		
BL-34	646.24	4.0	642.24	4.5	0.5	645.74	3.5							8.5	637.74						10.0	636.24
TB-93-1	575.45	2.0	573.45	5.8	0.0	575.45	2.0							7.8	567.65						10.0	565.45
TB-93-2	575.45	2.0	573.45	5.5	0.0	575.45	2.0				7.5	567.95	0.50	8.0	567.45						10.0	565.45
TB-93-3	575.45	3.0	572.45	4.0	0.0	575.45	3.0				7.0	568.45	0.80	7.8	567.65						10.0	565.45
TB-93-4	575.45	2.5	572.95	4.5	0.0	575.45	2.5				7.0	568.45	0.50	7.5	567.95						10.0	565.45
SB-101	643.65				1.0	642.65	9.0														10.0	633.65
SB-102	643.65										6.5	637.15	1.50	8.0	635.65						17.0	626.65
SB-103	643.55				1.0	642.55	4.0							5.0	638.55	9.00	14	629.55	17	626.55	17.0	626.55
SB-104	643.55				1.0	642.55	7.0							8.0	635.55						9.0	634.55
SB-105	643.55				1.0	642.55	5.0							6.0	637.55						9.0	634.55
SB-106	643.55				1.0	642.55	8.0														9.0	634.55
SB-107	643.55				1.3	642.25	8.7							9.8	633.75						10.0	633.55
SB-108	643.55				0.5	643.05	6.5							7.0	636.55						11.0	632.55
SB-109	643.55				1.0	642.55	6.5							7.5	636.05	7.00	14.5	629.05	17.1	626.45	17.1	626.45
SB-110	645.15				1.0	644.15	9.0														10.0	635.15
SB-111	640.99				1.0	639.99	4.5							5.5	635.49	10.20			15.7	625.29	15.7	625.29
SB-112	641.10				0.0	641.10	4.0							4.0	637.10						10.0	631.10
SB-113	642.44				0.0	642.44	3.5							3.5	638.94						10.0	632.44
SB-114	641.05				0.0	641.05	6.7							6.7	634.35						10.0	631.05
SB-115	643.15				1.0	642.15	6.5							7.5	635.65	6.00			13.5	629.65	13.0	630.15
SB-116	644.25				1.0	643.25	3.0							4.0	640.25	5.40			9.4	634.85	9.4	634.85
SB-117	642.75				1.0	641.75	3.0							4.0	638.75						10.0	632.75
SB-118	645.90				0.0	645.90	8.0							8.0	637.90						10.0	635.90
BCS-101	641.32				0.8	640.52	3.2							4.0	637.32						6.0	635.32
MW-101	643.75				1.0	642.75	5.5														6.5	637.25
MW-102	643.79				1.0	642.79	2.5							3.5	640.29	8.50	12	631.79	13.5	630.29	13.5	630.29
MW-103	643.50				0.5	643.00	10.75												11.25	632.25	11.25	632.25
MW-104	641.33				1.0	640.33	3.0							4.0	637.33	11.25			15.25	626.08	15.25	626.08
MW-105	641.27				0.5	640.77	1.0							1.5	639.77	6.50			8	633.27	8.0	633.27
MW-106	642.51				0.8	641.71	1.2							2.0	640.51	9.50			11.5	631.01	11.5	631.01
MW-107	641.66				1.0	640.66	0.7							1.7	639.96	8.30	10	631.66	13	628.66	13.0	628.66
MW-1	646.80	1.0	645.80	7.5										8.5	638.30						11.0	635.80
MW-2	643.65				0.0	643.65	6.5							6.5	637.15						10.3	633.35

Table 3-2
GENERAL MOTORS CORPORATION
STRATIGRAPHIC SUMMARY OF PREVIOUS INVESTIGATIONS (1987-1994)

BORING NO.	GROUND SURFACE ELEV.	TOP OF ASH FILL			TOP OF GENERAL FILL			TOP OF SAND			TOP OF ORGANIC SILT			TOP OF NATIVE CLAY			TOP OF TILL		TOP OF BEDROCK		BORING DEPTH	BORING BOTTOM ELEV.
		DEPTH	ELEV.	THICKNESS	DEPTH	ELEV.	THICK.	DEPTH	ELEV.	THICK.	DEPTH	ELEV.	THICK.	DEPTH	ELEV.	THICK.	DEPTH	ELEV.	DEPTH	ELEV.		
MW-3A	642.39				1.0	641.39	4.5				0.0	642.39	1.00	5.5	636.89						10.5	631.89
MW-4	641.07				0.0	641.07	4.0							4.0	637.07						10.5	630.57
MW-5	644.14				0.8	643.34	4.55				5.35	638.79	0.80	6.15	637.99						10.0	634.14
BH-6	646.90	0.5	646.40	5.0							5.50	641.40	0.25	5.75	641.15	10.75	16.5	630.4	17.2	629.7	22.2	624.70
BH-7	646.10	2.0	644.10	3.0	0.5	645.60	1.50				5.00	641.10	1.00	6.00	640.10	9.50	15.5	630.6	18.7	627.4	23.7	622.40
BH-8	646.38	2.0	644.38	1.75	1.0	645.38	1.00							3.75	642.63						8.0	638.38
BH-9	645.50	1.0	644.50	4.75										5.75	639.75						8.0	637.50
BH-10	646.28	1.0	645.28	2.5							3.50	642.78	2.00	5.50	640.78						8.0	638.28
BH-11	646.84	3.50	643.34	2.25	2.0	644.84	1.5							5.75	641.09						8.0	638.84
BH-12	646.87	1.0	645.87	2.75							3.75	643.12	0.25	4.00	642.87						8.0	638.87
BH-13	648.25	4.0	644.25	4.0	1.0	647.25	3.0				8.00	640.25	1.00	9.00	639.25						10.0	638.25
BH-14	646.30	1.0	645.30	3.0										4.00	642.30						6.0	640.30
BH-15	646.34	1.0	645.34	2.80										3.80	642.54						6.0	640.34
BH-16	647.27	1.0	646.27	2.75							3.75	643.52	0.25	4.00	643.27						8.0	639.27
BH-17	648.95				0.5	648.45	7.5				8.00	640.95	1.00	9.00	639.95						10.0	638.95
BH-18	646.05	1.0	645.05	4.25										5.25	640.80						6.0	640.05
BH-19	646.63	2.0	644.63	2.0	1.0	645.63	1.0							4.00	642.63						6.0	640.63
BH-20	648.15	6.0	642.15	3.0	0.5	647.65	5.5							9.00	639.15						10.0	638.15
BH-21	646.13	1.0	645.13	4.25										5.25	640.88						6.0	640.13
BH-22	646.73	1.0	645.73	6.5										7.5	639.23						8.0	638.73
BH-23	645.38	1.0	644.38	4.75										5.75	639.63						6.0	639.38
BH-24	645.75	0.5	645.25	5.25										5.75	640.00						6.0	639.75
BH-25	646.30	4.0	642.30	3.0	1.0	645.30	3.0							7.0	639.30						8.0	638.30
BH-26	645.38	2.0	643.38	3.5	1.0	644.38	1.0							5.5	639.88						6.0	639.38
BH-27	645.93	2.0	643.93	4.0	1.0	644.93	1.0				6.0	639.93	1.50	7.5	638.43						8.0	637.93

NOTES:

1) All measurements are in feet. Depth measurements reported are relative to the ground surface at the time the boring was drilled. Elevations are referenced to the NVGD datum.

Table 4-1
GENERAL MOTORS CORPORATION
CURRENT PCB RESULTS IN SOIL

			PCBs				CONGENER-SPECIFIC PCBs			
SAMPLE DATE	SAMPLE LOCATION	DEPTH (ft)	1242 (mg/kg)	1248 (mg/kg)	1254 (mg/kg)	1260 (mg/kg)	1242 (mg/kg)	1248 (mg/kg)	1260 (mg/kg)	TOTAL (mg/kg)
3/29/95	BL-95-1, S2	2-4					---	---	---	---
3/27/95	BL-95-2, S2	2-4					---	---	---	---
3/27/95	BL-95-3, S2	2-4					---	---	---	---
3/27/95	BL-95-4, S2	2-4					---	---	---	---
3/30/95	BL-95-10, S2	3-5					---	---	---	---
3/30/95	BL-95-10, S2 (Dupe)	3-5					---	---	---	---
3/30/95	BL-95-10, S3	5-7					---	---	---	---
3/29/95	BL-95-12, S3	4-6					---	---	---	---
4/4/96	BL-96-8	3-4	---	---	---	---		TIC		161.18
3/28/95	RW-95-1, S3	4-6					---	---	---	---
3/27/95	MW-200, S2	2-4					---	---	---	---
3/29/95	MW-204, S2	2-5					---	---	---	---
3/29/95	MW-204, S2 (Dupe)	2-5					---	---	---	---
7/11/96	MW-205, S1-S3	0-5								
7/11/96	MW-206, S4	7-9		6.1		6	TIC	TIC		19.1
9/9/96	MW-207, S3	4-6								
3/24/95	NWT-B2	3.5		27			---	---	---	---
3/24/95	NWT-C3	5.25		96			---	---	---	---
3/24/95	NWT-E2	1.8-2		0.027			---	---	---	---
3/24/95	SET-A1	1.2				0.17	---	---	---	---
3/24/95	SET-C2	2.8					---	---	---	---
3/24/95	SET-E3	5-7		180			---	---	---	---

Note: Blanks indicate parameter analyzed for but not detected.

--- Indicates parameters not analyzed for.

Table 4-2
GENERAL MOTORS CORPORATION
HISTORICAL PCB RESULTS IN SOIL

			PCBs			
SAMPLE DATE	SAMPLE LOCATION	DEPTH (ft)	1242 (mg/kg)	1248 (mg/kg)	1254 (mg/kg)	1260 (mg/kg)
4/14/87	TP-2	2-7		326		
8/87	TP-19		142		28	
2/17/89	TP-A			377		
4/4/90	TP-E			135		
4/3/90	TP-F					
4/14/93	TB-93-1	4-6	260			
4/14/93	TB-93-2	4-6	150			
4/14/93	TB-93-3	4-6	190			
4/14/93	TB-93-4	6-7	200			
11/5/93	BL-04	6-7		81		
11/5/93	BL-04 (Dupe)	6-7		150		
11/5/93	BL-06	6-7.5		0.041		
11/5/93	BL-07	6-7		73		
11/5/93	BL-07 (Dupe)	7-Jun		42		
11/5/93	BL-08	6-7		160		
11/5/93	BL-09	3-4		180		
11/4/93	BL-10	4-6		180		
11/4/93	BL-19	4-6		170		
11/4/93	BL-20	6-7		57		
11/4/93	BL-21	4-6		18		
11/4/93	BL-22	6-7		96		
11/3/93	BL-23	4-5.8				2.3
11/4/93	BL-24	6-7		86		
11/3/93	BL-25	6-7				

Note: Blanks indicate parameter analyzed for but not detected.

Table . 3
GENERAL MOTORS CORPORATION
CURRENT PCB RESULTS IN GROUNDWATER

		PCBs				CONGENER-SPECIFIC PCBs			
SAMPLE DATE	SAMPLE LOCATION	1242 (ug/l)	1248 (ug/l)	1254 (ug/l)	1260 (ug/l)	1242 (ug/l)	1248 (ug/l)	1260 (ug/l)	TOTAL (ug/l)
4/20/95	MW-1					---	---	---	---
4/18/95	MW-5					---	---	---	---
4/20/95	MW-200					---	---	---	---
4/20/95	MW-201					---	---	---	---
4/20/95	MW-202					---	---	---	---
4/18/95	MW-203	0.38				---	---	---	---
5/16/95	MW-203	0.2				---	---	---	---
4/4/96	MW-203	0.2			0.18		TIC		6.8
4/4/96	MW-203 (Dupe)	0.25			0.24	---	---	---	---
7/16/96	MW-203	0.3				TIC	TIC		1.29
4/18/95	MW-204					---	---	---	---
7/16/96	MW-205								
7/16/96	MW-206	1.9			1	TIC	TIC		4.95
7/16/96	MW-206 (Dupe)	2.5			1.3	---	---	---	---
9/11/96	MW-207								
9/11/96	MW-207 (Dupe)					---	---	---	---
4/18/95	RW-95-1					---	---	---	---
4/18/95	RW-95-1 (Dupe)					---	---	---	---

Note: Blanks indicate parameter analyzed for but not detected.
TIC indicates tentatively identified compound.
--- Indicates parameters not analyzed for.

Table 4-4
GENERAL MOTORS CORPORATION
HISTORICAL PCB RESULTS IN GROUNDWATER

		PCBs			
SAMPLE DATE	SAMPLE LOCATION	1242 (ug/l)	1248 (ug/l)	1254 (ug/l)	1260 (ug/l)
6/28/89	TB-1				
6/28/89	TB-2				
6/28/89	TB-3				
6/28/89	TB-4	1190		304	
6/28/89	TB-5	228		60.4	
6/28/89	TB-6	35.9		6.04	
4/4/90	TB-2				
4/3/90	MW-1				
4/4/90	TP-E*		15000		
4/3/90	TP-F				

Note: Blanks indicate parameter analyzed for but not detected.
* - Sample suspected to contain oil.

Table 4-5
GENERAL MOTORS CORPORATION
PCB SAMPLING OF STORM SEWERS

SAMPLE DATE	SAMPLE LOCATION	PCBs 1242	PCBs 1248	PCBs 1254	PCBs 1260	TOTAL ORGANIC CARBON
WATER		*(ug/l)*	*(ug/l)*	*(ug/l)*	*(ug/l)*	*(mg/l)*
-----	MH-1	---	---	---	---	---
5/18/95	MH-1		0.19			11
-----	MH-2	---	---	---	---	---
5/18/95	MH-2					3
4/3/96	MH-2					---
4/3/96	SW-1					---
4/3/96	SW-2					---
4/3/96	SW-3					---
SEDIMENT		*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*
4/11/95	MH-1		1.2			---
5/18/95	MH-1		2.3			42134±7427
4/11/95	MH-2		0.67			---
5/18/95	MH-2		31			29207±618
4/3/96	MH-2					---
4/3/96	SED-1					---
4/3/96	SED-2					---
4/3/96	SED-3					---

Note: Blanks indicate parameter analyzed for but not detected.

---- Location not sampled.

Samples SW-1 to SW-3 and SED-1 to SED-3 were collected from the Scajaquada Creek drain.

Table 4-6
GENERAL MOTORS CORPORATION
CURRENT LEAD RESULTS IN SOIL

SAMPLE DATE	SAMPLE LOCATION	DEPTH (ft)	TOTAL LEAD (mg/kg)	TCLP LEAD (mg/l)
3/29/95	BL-95-1, S1	0-2	250	
3/29/95	BL-95-1, S2	2-4	130	
3/27/95	BL-95-2, S1	0-2	360	
3/27/95	BL-95-2, S2	2-4	370	
3/27/95	BL-95-3, S2	2-4	3	
3/27/95	BL-95-3, S3	4-6	3.2	
3/27/95	BL-95-4, S2	2-4	19	
3/27/95	BL-95-4, S3	4-6	6.2	
3/27/95	BL-95-5, S2	2-4	320	
3/27/95	BL-95-5, S3	4-6	100	
3/27/95	BL-95-6, S2	2-4	1700	
3/27/95	BL-95-6, S3	4-6	730	0.78
3/27/95	BL-95-7, S2	2-4	13	
3/27/95	BL-95-7, S3	4-6	15	
3/27/95	BL-95-8, S2	2-4	1000	0.12
3/27/95	BL-95-8, S3	4-6	180	
3/28/95	BL-95-9, S2	2-4	2700	
3/28/95	BL-95-9, S3	4-6	14000	36.3
3/30/95	BL-95-10, S2	2-4	5.1	
3/30/95	BL-95-10, S2 (DUPE)	2-4	7.1	
3/30/95	BL-95-10, S3	4-6	120	
3/29/95	BL-95-11, S1	0-2	230	
3/29/95	BL-95-11, S2	2-4	840	0.912
3/29/95	BL-95-11, S2 (DUPE)	2-4	3700	0.779
3/29/95	BL-95-12, S1	0-2	190	
3/29/95	BL-95-12, S2	2-4	22	
3/29/95	BL-95-13, S2	2-4	900	
3/29/95	BL-95-13, S2 (Reanalysis)	2-4	3700	
3/29/95	BL-95-13, S2 (DUPE)	2-4	12000	43.1
3/29/95	BL-95-13, S2 (Reanalysis DUPE)	2-4	2700	
3/29/95	BL-95-13, S4	6-8	930	
3/28/95	BL-95-14, S1	0-2	210	
3/28/95	BL-95-14, S2	2-4	32	
3/29/95	BL-95-15, S1	0-2	420	
3/29/95	BL-95-15, S2	2-4	27	

Table 4-6
GENERAL MOTORS CORPORATION
CURRENT LEAD RESULTS IN SOIL

SAMPLE DATE	SAMPLE LOCATION	DEPTH (ft)	TOTAL LEAD (mg/kg)	TCLP LEAD (mg/l)
3/27/95	BL-95-16, S2	2-4	53	
3/27/95	BL-95-16, S3	4-6	46	
3/28/96	BL-96-2, S2	2-4	1550	
3/28/96	BL-96-6, S2	2-4	549	
3/28/96	BL-96-7, S2	2-4	1350	
3/28/95	RW-95-1, S2	2-4	1900	
3/28/95	RW-95-1, S3	4-6	150	
3/27/95	MW-200, S2	2-4	120	
3/27/95	MW-200, S3	4-6	6.9	
3/27/95	MW-200, S3 (DUPE)	4-6	8.3	
3/28/95	MW-201, S2	2-4	93	
3/28/95	MW-201, S3	4-6	770	
3/29/95	MW-204, S2	2-4	960	
3/29/95	MW-204, S3	4-6	980	
3/29/95	MW-204, S3 (DUPE)	4-6	3200	
7/11/96	MW-205, S1-S3	0-5	340	
7/11/96	MW-206, S3	5-7	210	
9/9/96	MW-207, S3	4-6	296	
3/21/95	TP-1AA	0-1	223	
3/21/95	TP-1A	1-3	1140	
3/21/95	TP-2AA	0-1	189	
3/21/95	TP-2A	1-3	411	
3/24/95	NWT-A1	1	160	
3/24/95	NWT-D2	2.6	250	
3/24/95	SET-B2	2.7	500	
3/24/95	SET-D1	5.7	430	

Table 4-7
GENERAL MOTORS CORPORATION
HISTORICAL LEAD RESULTS IN SOIL

SAMPLE DATE	SAMPLE LOCATION	DEPTH (ft)	TOTAL LEAD (mg/kg)	EP-TOX LEAD (mg/l)	TCLP LEAD (mg/l)
4/14/87	TP-1			0.5	
4/14/87	TP-2			5.8	
8/3/87	TP-3			0.2	
8/4/87	TP-8			ND	
8/6/87	TP-10			ND	
8/6/87	TP-13			0.1	
10/88	TP-19			ND	
4/4/90	TP-E	4.0		ND	
4/3/90	TP-F	3-4	ND	ND	
4/4/90	TP-2	5.0		ND	
4/14/93	TB-93-1	4-6		0.21	4.8
4/14/93	TB-93-2	4-6		0.029	3.9
4/14/93	TB-93-3	4-6		0.125	3
4/14/93	TB-93-4	6-7		0.087	0.11
11/3/95	BL-01, S2A	2-4	ND		
11/3/95	BL-01, S2B	2-4	690		
11/3/95	BL-01, S3	4-6	2220		
11/3/95	BL-01, S4	6-8	1130		0.36
11/3/95	BL-02, S1	0.5-2	850		
11/3/95	BL-02, S3	4-6	214		
11/3/95	BL-02, S3 (Dupe)	4-6	1120		
11/5/93	BL-03, S2A	2.5-2.8	4680		
11/5/93	BL-03, S2B	2.8-4	15300		316
11/5/93	BL-03, S3	4-6	1690		
11/5/93	BL-04, S1	2-4	299		
11/5/93	BL-04, S1 (Dupe)	2-4	169		
11/5/93	BL-04, S2	4.5-6	1300		6
11/5/93	BL-04, S2 (Dupe)	4.5-6	1810		
11/5/93	BL-04, S3	6-7	1020		
11/5/93	BL-05, S1A	4-5.5	83.1		
11/5/93	BL-05, S1B	5.5-6	1330		
11/5/93	BL-06, S1B	2.7-4	1380		
11/5/93	BL-06, S2	5-6	4650		0.44
11/5/93	BL-06, S3	6-7.5	452		
11/5/93	BL-07, S1	1-1.5	14.3		

Table 4-7
GENERAL MOTORS CORPORATION
HISTORICAL LEAD RESULTS IN SOIL

SAMPLE DATE	SAMPLE LOCATION	DEPTH (ft)	TOTAL LEAD (mg/kg)	EP-TOX LEAD (mg/l)	TCLP LEAD (mg/l)
11/5/93	BL-07, S2	2.5-4	293		
11/5/93	BL-07, S2 (Dupe)	2.5-4	253		
11/5/93	BL-07, S3	4-6	238		
11/5/93	BL-07, S4	6-7	908		
11/5/93	BL-08, S2A	2-3	79.2		
11/5/93	BL-08, S2B	3-4	1530		
11/5/93	BL-08, S2B (Dupe)	3-4	3210		
11/5/93	BL-08, S3	4-6	622		
11/5/93	BL-08, S4	6-7	1370		
11/5/93	BL-09, S1A	2-3	56.9		
11/5/93	BL-09, S1B	3-4	173		
11/5/93	BL-09, S2	4-6	377		
11/5/93	BL-09, S3	6-7	465		
11/4/93	BL-10, S2A	2-3	236		
11/4/93	BL-10, S2B	3-4	641		
11/4/93	BL-10, S3	4-6	798		
11/4/93	BL-10, S4	6-7	382		
11/4/93	BL-11, S2	2-4	498		
11/4/93	BL-11, S3	4-6	235		
11/4/93	BL-12, S2	2-4	2460		
11/4/93	BL-12, S3	4-6	502		
11/4/93	BL-13, S2	2-2.9	ND		
11/4/93	BL-13, S2 (Dupe)	2-2.9	ND		
11/4/93	BL-13, S3A	4-5.5	2750		
11/4/93	BL-13, S3B	5.5-6	7280		
11/4/93	BL-13, S4	6-6.5	1230		
11/4/93	BL-14, S2	2-4	3260		
11/4/93	BL-14, S3	4-6	288		
11/4/93	BL-15, S2	2-4	1060		
11/4/93	BL-15, S2 (Dupe)	2-4	6470		8.7
11/4/93	BL-15, S3A	4-6	1170		
11/3/93	BL-16, S1	0.5-2	823		
11/3/93	BL-16, S3	4-6	1900		
11/3/93	BL-16, S3 (Dupe)	4-6	1520		
11/3/93	BL-16, S4	6.5-7	ND		

Table 4-7
GENERAL MOTORS CORPORATION
HISTORICAL LEAD RESULTS IN SOIL

SAMPLE DATE	SAMPLE LOCATION	DEPTH (ft)	TOTAL LEAD (mg/kg)	EP-TOX LEAD (mg/l)	TCLP LEAD (mg/l)
11/4/93	BL-17, S2	2-4	1040		
11/4/93	BL-17, S3	4-5	205		
11/3/93	BL-18, S1	0.5-2	325		
11/3/93	BL-18, S2	2-4	760		
11/4/93	BL-19, S1	1.3-2	ND		
11/4/93	BL-19, S2	2.2-4	129		
11/4/93	BL-19, S3	4-6	1130		
11/4/93	BL-19, S3 (Dupe)	4-6	1210		
11/4/93	BL-19, S4A	6-6.8	8960		15.7
11/4/93	BL-19, S4B	6.8-7.4	120		
11/4/93	BL-20, S2	2-4	1340		
11/4/93	BL-20, S2 (Dupe)	2-4	1070		
11/4/93	BL-20, S3	4-6	528		0.35
11/4/93	BL-20, S4	6-7	314		
11/4/93	BL-21, S1	0.5-2	1150		
11/4/93	BL-21, S2	2-4	1940		
11/4/93	BL-21, S3	4-6	3320		
11/4/93	BL-21, S4	6-6.8	23900		5
11/4/93	BL-22, S2	2-4	727		
11/4/93	BL-22, S3A	4-5.8	793		
11/4/93	BL-22, S3A (Dupe)	4-5.8	1150		
11/4/93	BL-22, S3B	5.8-6	650		
11/4/93	BL-22, S4B	7-7.5	106		
11/3/93	BL-23, S1	0.5-2	296		
11/3/93	BL-23, S2	3-3.4	368		
11/4/93	BL-24, S2	2-4	2280		
11/4/93	BL-24, S3	4-6	2240		
11/3/93	BL-25, S1	0.5-2	ND		
11/3/93	BL-25, S2	2-4	2230		
11/3/93	BL-25, S3	5.5-6	1900		
11/3/93	BL-25, S4B	7-7.5	64.2		
11/16/93	BL-26, S1A	0.5-1.5	600		
11/16/93	BL-26, S1A (Dupe)	0.5-1.5	1190		
11/16/93	BL-26, S2	2-4	10500		17.6
11/16/93	BL-26, S3	4-4.5	1330		

Table 4-7
GENERAL MOTORS CORPORATION
HISTORICAL LEAD RESULTS IN SOIL

SAMPLE DATE	SAMPLE LOCATION	DEPTH (ft)	TOTAL LEAD (mg/kg)	EP-TOX LEAD (mg/l)	TCLP LEAD (mg/l)
11/16/93	BL-27, S1A	0.5-1.5	498		
11/16/93	BL-27, S2	2-3	256		
11/16/93	BL-27, S2 (Dupe)	2-3	102		
11/16/93	BL-28, S-1	1-2	510		2.8
11/16/93	BL-28, S2	2-3.5	856		
11/16/93	BL-29, S1	0.5-2	545		
11/16/93	BL-29, S1 (Dupe)	0.5-2	555		
11/16/93	BL-29, S2	2-3	917		
11/16/93	BL-30, S1	1-2	545		
11/16/93	BL-30, S2	2-4	1670		
11/16/93	BL-30, S2 (Dupe)	2-4	15400		10.6
11/16/93	BL-31, S1	1-2	1140		
11/16/93	BL-31, S1 (Dupe)	1-2	528		
11/16/93	BL-31, S2	2-4	2840		
11/16/93	BL-31, S3	5.5-6	1750		
11/16/93	BL-31, S4	6-6.7	1860		
11/16/93	BL-32, S2A	2-3.5	2050		6.2
11/16/93	BL-32, S2B	3.5-4	1350		
11/16/93	BL-32, S3	4-6	117		
11/16/93	BL-33, S1	0.5-2	ND		
11/16/93	BL-33, S2A	2-3.8	278		
11/16/93	BL-33, S3	4-5	102		
11/16/93	BL-34, S1	0.5-2	61.5		
11/16/93	BL-34, S2	2-4	ND		
11/16/93	BL-34, S3	4-6	674		
4/25/94	SB-118, S3	4-6	1360		
9/94	BH-1, S1	0.5-2	50		
9/94	BH-2, S1	0.5-2	757		
9/94	BH-3, S1	0.5-2	99		
9/94	BH-4, S1	0.5-2	290		
9/94	BH-5, S1	0.5-2	280		
9/16/94	BH-6, S2	2-4	151		
9/16/94	BH-6, S3	4-6	59.2		
9/16/94	BH-7, S2	2-4	1170		
9/16/94	BH-7, S3	4-6	55		

Table 4-7
GENERAL MOTORS CORPORATION
HISTORICAL LEAD RESULTS IN SOIL

SAMPLE DATE	SAMPLE LOCATION	DEPTH (ft)	TOTAL LEAD (mg/kg)	EP-TOX LEAD (mg/l)	TCLP LEAD (mg/l)
9/16/94	BH-8, S1	0.5-2	329		
9/16/94	BH-8, S2	2-4	1520		
9/16/94	BH-9, S1	0.5-2	245		
9/16/94	BH-9, S	2-4	8300		
9/16/94	BH-9, S2 (Dupe)	2-4	1690		
9/16/94	BH-10, S1	0.5-2	733		
9/16/94	BH-10, S2	2-4	220		
10/24/95	BH-11, S3	4-6	120		
10/24/95	BH-12, S2	2-4	960		
10/24/95	BH-13, S4	6-8	2900		
10/24/95	BH-14, S2	2-4	4400		
10/24/95	BH-15, S2	2-4	280		
10/24/95	BH-16, S2	2-4	630		
10/24/95	BH-16, S2 (Dupe)	2-4	720		
10/24/95	BH-17, S5	8-10	1500		
10/24/95	BH-17, S5 (Dupe)	8-10	5000		
10/24/95	BH-18, S2	2-4	490		
10/24/95	BH-19, S2	2-4	4000		
10/24/95	BH-20, S4	6-8	1300		
10/24/95	BH-21, S2	2-4	440		
10/24/95	BH-22, S2	2-4	460		
10/24/95	BH-23, S3	4-6	770		
10/25/94	BH-24, S2	2-4	720		
10/25/94	BH-25, S3	4-6	530		
10/25/94	BH-26, S3	4-6	1300		
10/25/94	BH-27, S3	4-6	970		
11/10/94	TP-BH-9-N	4-6	1600		
11/10/94	TP-BH-9-E	4-6	710		
11/10/94	TP-BH-9-S	4-6	760		
11/10/94	TP-BH-9-W	4-6	1200		
11/10/94	TP-BH-17-N	8-11	950		
11/10/94	TP-BH-17-E	8-11	350		
11/10/94	TP-BH-17-S	8-11	1700		
11/10/94	TP-BH-17-W	8-11	4300		

Table 4-8
GENERAL MOTORS CORPORATION
LEAD SCREENING RESULTS FROM AAM CONSTRUCTION

COLLECTION DATE	WASTE PILE	TOTAL LEAD RESULTS (mg/kg)	TCLP LEAD RESULTS (mg/l)
7/11/95	WP-69	78	<0.1
7/7/95	WP-68	600	0.6
6/30/95	WP-67	360	0.3
6/28/95	WP-64	810	1.5
6/28/95	WP-63	670	1.0
6/28/95	WP-62	220	0.5
6/27/95	WP-61	690	0.4
6/23/95	WP-59	410	0.1
6/22/95	WP-58	800	0.6
6/21/95	WP-57	540	2.0
6/16/95	WP-56	370	2.7
6/16/95	WP-55	470	0.7
6/14/95	WP-54	230	<0.1
6/13/95	WP-53	250	0.1
6/12/95	WP-52	240	<0.1
6/9/95	WP-51	870	0.1
6/8/95	WP-50	380	0.5
6/7/95	WP-49	600	0.6
6/6/95	WP-48	560	0.2
6/5/95	WP-47	1100	0.4
6/2/95	WP-46	860	0.8
6/1/95	WP-45	420	1.4
5/31/95	WP-44	260	0.3
5/30/95	WP-43	500	0.7
5/26/95	WP-42	1000	1.0
5/25/95	WP-41	490	0.7
5/25/95	WP-40	560	3.8
5/24/95	WP-39	580	3.0
5/18/95	WP-38	1300	0.2
5/11/95	WP-37-S	160	0.2
5/11/95	WP-36-N	370	0.7
5/9/95	WP-35	150	0.005
4/21/95	WP-34	48	<0.1
4/21/95	WP-33	130	<0.1
4/5/95	WP-32		<0.1

Table 4-8
GENERAL MOTORS CORPORATION
LEAD SCREENING RESULTS FROM AAM CONSTRUCTION

COLLECTION DATE	WASTE PILE	TOTAL LEAD RESULTS (mg/kg)	TCLP LEAD RESULTS (mg/l)
4/4/95	WP-31		<0.1
2/10/95	WP-30		0.1
1/19/95	WP-29		0.3
1/13/95	WP-025, 026, 027, 028		<0.1
1/10/95	WP-021, 022, 023, 024		0.7
12/16/94	WP-017, 018, 019, 020		4.2
12/15/94	WP-013, 014, 015, 016		0.2
12/8/94	WP-009, 010, 011, 012		0.17
12/1/94	WP-005, 006, 007, 008	910	<0.1
11/29/94	WP-001, 002, 003, 004		0.5
11/22/94	AA-WP-1		0.1
11/22/94	AA-WP-2		0.9

NOTE: Blanks indicate not analyzed for.

Table 4-9
GENERAL MOTORS CORPORATION
CURRENT LEAD RESULTS IN GROUNDWATER

SAMPLE DATE	SAMPLE LOCATION	TOTAL LEAD (mg/l)	DISSOLVED LEAD (mg/l)	TURBIDITY (ntu)
4/20/95	MW-1	ND	0.005	18.6
4/18/95	MW-5	0.024	ND	76.9
4/20/95	MW-200	0.049	ND	>200
4/20/95	MW-201	0.005	ND	57.5
4/20/95	MW-202	0.011	ND	186.6
4/18/95	MW-203	0.098	ND	59.8
7/16/96	MW-203	0.12	0.003	>200
5/16/95	MW-204	0.068	0.001	112.8
4/18/95	MW-204 (Dupe)	0.048	-----	-----
7/16/96	MW-205	0.12	ND	>200
7/16/96	MW-206	0.25	0.002	>200
9/11/96	MW-207	0.0366	0.0022	>200
9/11/96	MW-207 (Dupe)	0.118	-----	-----
4/18/95	RW-95-1	0.001	ND	4.8

Note: ND Not detected.
----- Not sampled.

Table 4-10
GENERAL MOTORS CORPORATION
HISTORICAL LEAD RESULTS IN GROUNDWATER

SAMPLE DATE	SAMPLE LOCATION	TOTAL LEAD (mg/l)	DISSOLVED LEAD (mg/l)	TURBIDITY (ntu)
6/28/89	TB-2	2.4	-----	-----
6/28/89	TB-4	9.8	-----	-----
4/4/90	TP-E	0.6	0.42	-----
4/3/90	TP-F	0.54	0.32	-----
4/3/90	MW-1	0.012	0.011	-----
4/4/90	TB-2	0.006	0.007	-----
4/29/94	MW-1	0.257	-----	-----
4/29/94	MW-5	1.07	-----	-----

Note: ----- Not sampled.

Table 4-11
GENERAL MOTORS CORPORATION
LEAD SAMPLING OF STORM SEWERS

SAMPLE DATE	SAMPLE LOCATION	TOTAL LEAD
WATER		***(mg/l)***
-----	MH-1	-----
5/18/95	MH-1	0.014
4/11/95	MH-2	0.001
5/18/95	MH-2	0.002
4/3/96	MH-2	0.027
5/21/96	MH-2	0.002
4/3/96	SW-1	0.0014
4/3/96	SW-2	0.0027
4/3/96	SW-3	0.0016
SEDIMENT		***(mg/kg)***
-----	MH-1	-----
5/18/95	MH-1	360
-----	MH-2	-----
5/18/95	MH-2	92
4/3/96	MH-2	34.6
4/3/96	SED-1	51.1
4/3/96	SED-2	64.5
4/3/96	SED-3	178

Note: ---- Location not sampled.

Table 5-1
GENERAL MOTORS CORPORATION
PHYSICAL AND CHEMICAL PROPERTIES OF POLYCHLORINATED BIPHENYLS (PCBs)

PARAMETER	AROCLOR 1242	AROCLOR 1248	AROCLOR 1254	AROCLOR 1260
CAS Number	53469-21-9	12672-29-6	11097-69-1	11096-82-5
Molecular Weight (g/mole) (avg)	257.5	288	327	370
Principle Components (Number of chlorine atoms)	3-4	3-5	5-7	5-7
Physical State	Clear, mobile liquid	Oily, light yellow liquid	Light yellow,viscous liquid	Light yellow, sticky resin
Water Solubility (mg/l) @ 20-25°C	0.24	0.052	0.012	0.003
Organic Solvent Solubility	Soluble	Soluble	Soluble	Soluble
Density (g/cm^3)	1.38	1.41	1.5	1.57
Melting Point (°C)	-19	-7	10	31
Boiling Point (°C)	325-366	340-375	365-390	385-420
Vapor Pressure (mm Hg @ 25°C)	4.06E-04	4.94E-04	7.71E-05	4.05E-05
Henry'sLaw Constant (atm-m^3/mole)	5.60E-04	3.50E-03	2.30E-03	7.10E-03
Log Kow (octanol-water partition coefficient)	5.58	6.11	5.61-6.47	6.91
Log Koc (soil adsorption coefficient)	3.71	5.64	4.62-5.61	6.42

Sources: Alford-Stevens, 1986; ATSDR, 1987; Lyman, 1982; USEPA, 1986; Groundwater Chemicals Desk Reference; Erickson, 1992

Table 5-2
GENERAL MOTORS CORPORATION
PHYSICAL AND CHEMICAL PROPERTIES OF LEAD

PARAMETER	LEAD
CAS Number	7439-92-01
Molecular Weight (g/mole)	207.19
Physical State	Bluish-gray solid
Water Solubility (mg/l) @ 20-25°C	Insoluble
Organic Solvent Solubility	NA
Density (g/cm^3)	11.3
Melting Point (°C)	327
Boiling Point (°C)	1770
Vapor Pressure (mm Hg @ 25°C)	1 (980°C)

Notes:

Properties listed are for pure elemental lead. Properties of compounds vary.

NA: Not Applicable

Sources: ATSDR, 1987, 1988, 1989; USEPA, 1980,1986; Weast, 1980; Glover, 1992.

Table 5-3
GENERAL MOTORS CORPORATION
RELATIVE SIGNIFICANCE OF FATE AND TRANSPORT MECHANISMS FOR PCBs

Removal Mechanisms

TYPE	AIR	WATER	SOIL/SEDIMENT
Volatilization	NA*	Significant from surface soils for less chlorinated compounds only**	Significant in surface water; with less chlorinated mixtures only
Deposition	Predominant removal mechanism; both wet and dry occur	NA	NA
Sorption	Significant association with particulates for mixtures with higher vapor pressure (>10E-4)	Adsorption to sediments and other organic matters is major fate mechanism	NA
Bioaccumulation	NA	Very significant	Significant for benthos
Leaching	NA	NA	Not significant except in presence of organic solvents

Degradation Mechanisms

TYPE	AIR	WATER	SOIL/SEDIMENT
Photolysis	Prominent degradation process	Occurs to some extent with more chlorinated mixtures	NA
Hydrolysis	NA	Not significant	Not significant
Oxidation	Not significant	Not significant unless in presence of chlorine or ozone	Not significant
Biodegradation	NA	Significant for less chlorinated mixtures only	Significant for more chlorinated mixtures only

Note: * -NA: Not Applicable
** -Less chlorinated mixtures: average of 1 to 4 chlorine atoms
-More chlorinated mixtures: average 5 to 7 chlorine atoms

Table 6-1
GM-SAGINAW
OPERABLE UNITS 1 AND 2
HUMAN HEALTH RISK ASSESSMENT
Summary of Exposure and Risk Variables

Variable	Description	Value	Rationale	Reference
CS	Representative contaminant concentration in soil	129 mg/kg (PCBs) 7012 mg/kg (lead)	Average of concentrations detected in hot spot area (see Sheets 13 and 14)	
SA	Skin surface area available for contact	3300 cm^2	Average of 50th percentile surface area of upper extremities for adult males and females	USEPA, 1990
ABS	Dermal absorption factor for PCBs	0.04	Based on estimated 12.5% absorption over 24 hours; assuming linearity, absorption over 8-hour workday would be 4%	MADEP, 1992
AF	Soil-to-skin adherence factor	1.45 mg/cm^2	Standard assumption based on potting soil	USEPA, 1989
IR	Intake rate: ingestion Intake rate: inhalation	50 mg/day 20 m^3/day	Occupational setting	USEPA, 1991
EF	Exposure frequency	65 events/year	5-day work week for 3 months (13 weeks)	
ED	Exposure duration	1 year	Assumes one-time event (will not recur over multiple years)	
FI	Fraction of daily incidental soil ingestion derived from site	1.0	Conservative assumption	
BW	Body weight	70 kg	Standard assumption	USEPA, 1991
AT	Averaging time	25550 days (70 years) for carcinogenic effects 91 days (365 days/4) for noncarcinogenic effects	Standard assumptions: Exposure is averaged over a 70-year lifetime for carcinogenic effects and over the period of exposure for noncarcinogenic effects	USEPA, 1991
SF	Carcinogenic slope factor for PCBs	7.7 $(mg/kg\text{-}day)^{-1}$		USEPA, 1995
RfD	Reference Dose for PCBs	5E-06 mg/kg-day (oral) 6E-06 mg/kg-day (inhalation)	 Based on a reference concentration of 2×10^{-5} mg/m^3	MADEP, 1992 MADEP, 1994

Table 6-2
GM-SAGINAW
OPERABLE UNITS 1 AND 2
HUMAN HEALTH RISK ASSESSMENT
Calculation of Representative Maximum Soil Exposure Concentrations

	Sample Identification	Concentration (mg/kg)
PCBs		
Area 1	BL-09	180
	TP-D	266
	SET-A-1	0.17
	NWT-B2	27
Average		**118**
Area 2	TB-93-4	200
	TB-93-3	190
	TB-93-2	150
	TB-93-1	260
	TB-6	57.5 [1]
	TP-2	32.6
	TP-1	12.5 [2]
Average		**129**
Lead	BL-21	28900
	BL-22	1150
	BL-11	498
	BL-25	2230
	BL-24	2280
		7012

See Sheets 13 and 14 for sample locations.

[1] Average of reported concentrations of 73 and 42 mg/kg.

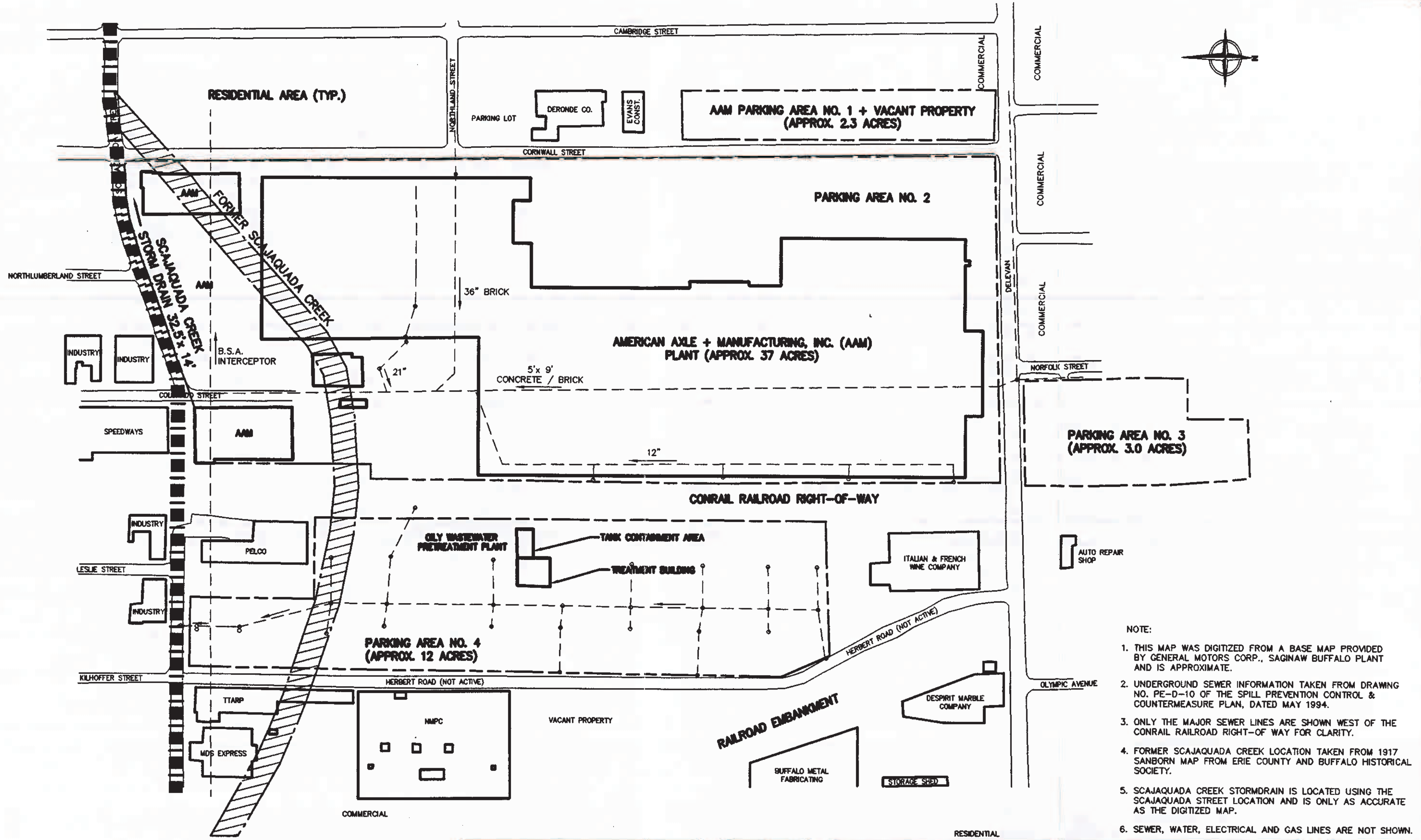
[2] Reported as <25 mg/kg; half of detection limit used.

Table 6-3
GM-SAGINAW
OPERABLE UNITS 1 AND 2
HUMAN HEALTH RISK ASSESSMENT
Summary of Variables Used in the Calculation of Fugitive Dust Concentrations

Variable		Value	Rationale	Reference
G	Silt content	0.10		
H	No. days/year with greater then 0.25 mm precipitation	150	For upstate New York	USEPA, 1988
I	Percentage of time that wind speeds exceeds 12 mph	18.4	Average of reported values of 18.51 and 18.38 for Buffalo, NY	NYSDEC, 1979
J	Fraction of total suspended particulates	0.5	Estimate in Air Quality Handbook	CEQA, 1993
SF	Suspension factor (sec/m)	15	Conservative screening value for areas with a width of between 300 and 3300 feet	NYSDEC, 1991

FIGURES

ENE-GI1/APPS: F:\DWG\04428\GI059429.dwg Xrefs: <NONE>
Scale: 1 = 1.00 Date: 8/25/95 Time: 11:36 AM Operator: MPARKER



NOTE:

1. THIS MAP WAS DIGITIZED FROM A BASE MAP PROVIDED BY GENERAL MOTORS CORP., SAGINAW BUFFALO PLANT AND IS APPROXIMATE.
2. UNDERGROUND SEWER INFORMATION TAKEN FROM DRAWING NO. PE-D-10 OF THE SPILL PREVENTION CONTROL & COUNTERMEASURE PLAN, DATED MAY 1994.
3. ONLY THE MAJOR SEWER LINES ARE SHOWN WEST OF THE CONRAIL RAILROAD RIGHT-OF WAY FOR CLARITY.
4. FORMER SCAJAQUADA CREEK LOCATION TAKEN FROM 1917 SANBORN MAP FROM ERIE COUNTY AND BUFFALO HISTORICAL SOCIETY.
5. SCAJAQUADA CREEK STORMDRAIN IS LOCATED USING THE SCAJAQUADA STREET LOCATION AND IS ONLY AS ACCURATE AS THE DIGITIZED MAP.
6. SEWER, WATER, ELECTRICAL AND GAS LINES ARE NOT SHOWN.

EMCON

DATE 8/25/95
DWN MWP
APP
REV

GENERAL MOTORS, CORP.
REMEDIAL INVESTIGATION
CITY OF BUFFALO, ERIE COUNTY, NEW YORK

FACILITY PLAN AND SEWER LOCATION PLAN

FIGURE
3-2
PROJECT NO.
84853-0P5

Figure 6-1
GM-SAGINAW
OPERABLE UNITS 1 AND 2
HUMAN HEALTH RISK ASSESSMENT
Estimation of PCB Intake Through Dermal Contact with Soil

$$\text{Intake (mg/kg-day)} = \frac{CS \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

where:

CS = Chemical concentration of PCBs in soil (mg/kg) = 129 mg/kg (from Table 6-1)
CF = Conversion factor (10^{-6} kg/mg)
SA = Skin surface area available for contact = 3300 cm^2/event
AF = Soil to skin adherence factor = 1.45 mg/cm^2
ABS = Absorption factor = 0.04 (4%; unitless)
EF = Exposure frequency = 65 events/year
ED = Exposure duration = 1 year
BW = Body weight = 70 kg
AT = Averaging time (period over which exposure is averaged) = 25550 days (70 years) for carcinogenic effects and 91 days (3 months) for noncarcinogenic effects

See Table 6-2 for derivation of variable values.

$$\underset{\text{(carcinogenic effects)}}{\text{Intake (mg/kg-day)}} = \frac{129 \text{ mg/kg} \times 1\text{E-}6 \times 3300 \text{ cm}^2 \times 1.45 \text{ mg/cm}^2\text{-event} \times 0.04 \times 65 \text{ events/yr.} \times 1 \text{ year}}{70 \text{ kg} \times 25550 \text{ days}}$$

$$= \mathbf{9.0E\text{-}7\ mg/kg\text{-}day}$$

$$\underset{\text{(noncarcinogenic effects)}}{\text{Intake (mg/kg-day)}} = \frac{129 \text{ mg/kg} \times 1\text{E-}6 \times 3{,}300 \text{ cm}^2 \times 1.45 \text{ mg/cm}^2 \times 0.04 \times 65 \text{ events/yr.} \times 1 \text{ year}}{70 \text{ kg} \times 91 \text{ days}}$$

$$= \mathbf{2.5E\text{-}4\ mg/kg\text{-}day}$$

Figure 6-2
GM-SAGINAW
OPERABLE UNITS 1 AND 2
HUMAN HEALTH RISK ASSESSMENT
Estimation of PCB Intake Through Incidental Ingestion of Soil

$$\text{Intake (mg/kg-day)} = \frac{CS \times CF \times IR \times FI \times EF \times ED}{BW \times AT}$$

where:

CS = Chemical concentration of PCBs in soil = 129 mg/kg (from Table 6-1)
CF = Conversion factor (10^{-6} mg/kg)
IR = Ingestion rate = 50 mg soil/day
FI = Fraction ingested from contaminated source = 1.00 (100%; unitless)
EF = Exposure frequency = 65 events/year
ED = Exposure duration = 1 year
BW = Body weight = 70 kg
AT = Averaging time (period over which exposure is averaged) = 25550 days (70 years) for carcinogenic effects and 91 days (3 months) for noncarcinogenic effects

See Table 6-2 for derivation of variable values.

$$\begin{array}{l}\text{Intake (mg/kg-day)} = \\ \text{(carcinogenic effects)}\end{array} \frac{129 \text{ mg/kg} \times 1\text{E-}6 \times 50 \text{ mg /day} \times 1.00 \times 65 \text{ events/yr.} \times 1 \text{ year}}{70 \text{ kg} \times 25550 \text{ days}}$$

= **2.3E-7 mg/kg-day**

$$\begin{array}{l}\text{Intake (mg/kg-day)} = \\ \text{(noncarcinogenic effects)}\end{array} \frac{129 \text{ mg/kg} \times 1\text{E-}6 \times 50 \text{ mg /day} \times 1.00 \times 65 \text{ events/yr.} \times 1 \text{ year}}{70 \text{ kg} \times 91 \text{ days}}$$

= **6.6E-5 mg/kg-day**

Figure 6-3
GM-SAGINAW
OPERABLE UNITS 1 AND 2
HUMAN HEALTH RISK ASSESSMENT
Estimation of Ambient Air Dust Concentrations

EMISSION RATE:

$$E = [1.7 x \frac{G}{1.5} x \frac{(365 - H)}{235} x \frac{I}{15} x J]$$

where:

E = Emission rate (lbs/acre-day)
G = Silt content = 0.10 (10%; unitless)
H = Number of days/year with greater than or equal to 0.01 inch precipitation = 150
I = Percentage of time that wind speed exceeds 5.4 m/sec (12 mph) = 18.4% (unitless)
J = Fraction of total suspended particulates = 50% (unitless)

See Table 6-3 for derivation of variable values.

$$E = 1.7 \text{ x } \frac{0.10}{1.5} \text{ x } \left(\frac{365 \quad - \quad 150}{235} \right) \text{ x } \frac{18.4}{15} \text{ x } 0.5$$

$$= 0.0636 \ \frac{\text{lbs}}{\text{acre-day}} \text{ x } 1.30\text{E-03} \ \frac{\text{mg/m}^2\text{-sec}}{\text{lbs/acre-day}}$$

$$= 8.3\text{E-05} \ \frac{\text{mg}}{\text{m}^2\text{-sec}}$$

AMBIENT CONCENTRATION:

$$CA = E \text{ x } SF$$

where:

CA = Ambient air dust concentration (mg/m^3)
E = Emission rate = 8.3 x 10^{-5} mg/m^2-sec
SF = Suspension factor = 15 sec/m (from Table 6-3)

$$CA = 8.3\text{E-05} \ \frac{\text{mg}}{\text{m}^2\text{-sec}} \text{ x } 15 \ \frac{\text{sec}}{\text{m}} = 0.0012 \ \frac{\text{mg}}{\text{m}^3}$$

$$CA = 0.0012 \ \frac{\text{mg}}{\text{m}^3} \text{ x } 1\text{E-06} \ \frac{\text{kg}}{\text{mg}} = 1.24\text{E-09} \ \frac{\text{kg}}{\text{m}^3}$$

Figure 6-4
GM-SAGINAW
OPERABLE UNITS 1 AND 2
HUMAN HEALTH RISK ASSESSMENT
Estimation of PCB Intake Through Dust Inhalation

$$\text{Intake (mg/kg-day)} = \frac{CS \times CD \times IR \times FR \times EF \times ED}{BW \times AT}$$

where:

CS = Chemical concentration of PCBs in soil = 129 mg/kg (from Table 6-1)
CA = Concentration of dust in ambient air = 1.24×10^{-9} kg/m^3 (from Figure 6-3)
IR = Inhalation rate = 20 m^3/day
FR = Fraction that is respirable (<10um particle size) = 1.00 (100%; unitless)
EF = Exposure frequency = 65 events/year
ED = Exposure duration = 1 years
BW = Body weight = 70 kg
AT = Averaging time (period over which exposure is averaged) = 25550 days (70 years) for carcinogenic effects and 91 days (3 months) for noncarcinogenic effects

See Table 6-2 for derivation of variable values.

$$\underset{\text{(carcinogenic effects)}}{\text{Intake (mg/kg-day)}} = \frac{129 \text{ mg/kg} \times 1.24\text{E-09 kg/m}^3 \times 20 \text{ m}^3\text{/day} \times 1.00 \times 65 \text{ days/yr.} \times 1 \text{ year}}{70 \text{ kg} \times 25550 \text{ days}}$$

= **1.2E-10 mg/kg-day**

$$\underset{\text{(noncarcinogenic effects)}}{\text{Intake (mg/kg-day)}} = \frac{129 \text{ mg/kg} \times 1.24\text{E-09 mg/kg} \times 20 \text{ m}^3\text{/day} \times 1.00 \times 65 \text{ days/yr.} \times 1 \text{ year}}{70 \text{ kg} \times 91 \text{ days}}$$

= **3.3E-8 mg/kg-day**

Figure 6-5
GM-SAGINAW
OPERABLE UNIT 1
HUMAN HEALTH RISK ASSESSMENT
Estimation of Carcinogenic Risks Through PCB Exposure

Risk = Intake x SF

where:

Intake = Daily intake of PCBs (mg/kg-day; from Figures 6-1, 6-2 and 6-4)
SF = Carcinogenic slope factor = 7.7 $(mg/kg\text{-}day)^{-1}$ (from Table 6-2)

Risk = 9.0E-07 mg/kg-day x 7.7
(dermal contact)
= 7E-06

Risk = 2.3E-07 mg/kg-day x 7.7
(incidental ingestion)
= 2E-06

Risk = 1.2E-10 mg/kg-day x 7.7
(inhalation)
= 9E-10

MULTIPATHWAY CARCINOGENIC RISK = $\sum \mathbf{Risk}_{(dermal)} + \mathbf{Risk}_{(ingestion)} + \mathbf{Risk}_{(inhalation)}$

= **9E-6**

Figure 6-6
GM-SAGINAW
OPERABLE UNITS 1 AND 2
HUMAN HEALTH RISK ASSESSMENT
Estimation of Noncarcinogenic Hazards Through PCB Exposure

$$\text{Hazard Quotient} = \text{HQ} = \frac{\text{Intake}}{\text{RfD}}$$

where:

Intake = Daily intake of PCBs (mg/kg-day; from Figures 6-1, 6-2 and 6-4)
RfD = Reference dose = 1 x 10-4 (mg/kg-day (from Table 6-1)

$$\text{HQ (dermal contact)} = \frac{2.5\text{E-}04 \quad \text{mg/kg-day}}{5\text{E-}06 \quad (\text{mg/kg-day})^{-1}}$$

$$= 5\text{E+}01$$

$$\text{HQ (incidental ingestion)} = \frac{6.6\text{E-}05 \quad \text{mg/kg-day}}{5\text{E-}06 \quad (\text{mg/kg-day})^{-1}}$$

$$= 1\text{E+}01$$

$$\text{HQ (inhalation)} = \frac{1.2\text{E-}10 \quad \text{mg/kg-day}}{6\text{E-}06 \quad (\text{mg/kg-day})^{-1}}$$

$$= 2\text{E-}5$$

MULTIPATHWAY NONCARCINOGENIC HAZARD $= \sum \textbf{Hazard(dermal)} + \textbf{Hazard(ingestion)} + \textbf{Hazard(inhalation)}$

$= \mathbf{6E{+}1}$

Note: Numbers may not appear to sum due to rounding.

Figure 6-7
GM-SAGINAW
OPERABLE UNITS 1 AND 2
HUMAN HEALTH RISK ASSESSMENT
Estimation of Lead Intake Through Incidental Ingestion of Soil

$$\text{Intake (mg/kg-day)} = \frac{CS \times CF \times IR \times FI}{BW}$$

where:

CS = Chemical concentration of lead in soil = 7012 mg/kg (from Table 6-1)
CF = Conversion factor (10^{-6} kg/mg)
IR = Ingestion rate = 50 mg soil/day
FI = Fraction ingested from contaminated source = 1.00 (100%; unitless)
BW = Body weight = 70 kg

See Table 6-2 for derivation of variable values.

$$\text{Daily Intake (mg/kg-day)} = \frac{7{,}012\ \text{mg/kg} \times 1\text{E-}6\ \text{kg/mg} \times 50\ \text{mg/day} \times 1.00}{70\ \text{kg}}$$

$$= \mathbf{5.0E\text{-}3\ mg/kg\text{-}day}$$

Figure 6-8
GM-SAGINAW
OPERABLE UNITS 1 AND 2
HUMAN HEALTH RISK ASSESSMENT
Estimation of Lead Intake Through Dust Inhalation

$$\text{Intake (mg/kg-day)} = \frac{CS \times CA \times IR \times FR}{BW}$$

where:

CS = Chemical concentration of lead in soil = 7012 mg/kg (from Table 6-1)
CA = Concentration of dust in ambient air = 1.24×10^{-9} kg/m^3 (from Figure 6-3)
IR = Inhalation rate = 20 m^3/day
FR = Fraction that is respirable (<10um particle size) = 1.00 (100%; unitless)
BW = Body weight = 70 kg

See Table 6-2 for derivation of variable values.

$$\text{Daily Intake (mg/kg-day)} = \frac{7{,}012\ \text{mg/kg} \times 1.24\text{E-09 kg/m}^3 \times 20\ \text{m}^3\text{/day} \times 1.00}{70\ \text{kg}}$$

= **2.5E-6 mg/kg-day**

Figure 6-9
GM-SAGINAW
OPERABLE UNITS 1 AND 2
HUMAN HEALTH RISK ASSESSMENT
Estimation of Acceptable Occupational Lead Intake

$$\text{Intake (mg/kg-day)} = \frac{CA_{OSHA} \text{ X } IR \text{ X } FR}{BW}$$

where:

CA_{OSHA} = OSHA Permissible Exposure Limit PEL) for lead = 50 ug/m^3 = 0.050 mg/m^3
IR = Inhalation rate = 20 m^3/day
FR = Fraction that is respirable (<10um particle size) = 1.00 (100%; unitless)
BW = Body weight = 70 kg

See Table 6-2 for derivation of variable values.

$$\text{Daily Acceptable Occupational Intake (mg/kg-day)} = \frac{0.050 \text{ mg/m}^3 \times 20 \text{ m}^3\text{/day} \times 1.00}{70 \text{ kg}}$$

$$= \mathbf{1.4E\text{-}2 \text{ mg/kg-day}}$$

Figure 6-10
GM-SAGINAW
OPERABLE UNITS 1 AND 2
HUMAN HEALTH RISK ASSESSMENT
Estimation of Hazard through Lead Exposure

$$\text{Hazard Quotient} = \text{HQ} = \frac{\text{Intake}_{(\text{site})}}{\text{Intake}_{(\text{occup})}}$$

where:

$\text{Intake}_{(\text{site})}$ = Daily intake of lead (mg/kg-day)
$\text{Intake}_{(\text{occup})}$ = Acceptable occupational intake (intake at OSHA PEL)

$\text{Intake}_{(\text{site})}$ = Daily $\text{Intake}_{(\text{ingestion})}$ + Daily $\text{Intake}_{(\text{inhalation})}$
= 5.0E-03 + 2.5E-06 (from Figures 6-7 and 6-8)
= 5.0E-03

$\text{Intake}_{(\text{occup})}$ = 1.4E-02 (from Figure 6-9)

$$\text{Hazard} = \frac{5.0\text{E-}03 \text{ mg/kg-day}}{1.4\text{E-}02 \text{ mg/kg-day}}$$

= **4E-1**

APPENDIX A

SITE HISTORY REPORT

SITE HISTORY EVALUATION OF "ASH-LIKE" FILL
PARKING LOT #4
BUFFALO PLANT
FORMER SAGINAW DIVISION
GENERAL MOTORS CORPORATION
BUFFALO, NEW YORK

TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

The area under investigation (Site) is presently named Parking Lot #4 and is described as being bounded on the north by East Delavan Avenue, on the east by the former Delaware Lackawanna and Western Railroad right-of-way (now abandoned), on the south by the present day Scajaquada Street, and on the west by the former NY Lake Erie and Western Railroad embankment, now Conrail Railroad right-of-way. The scope of work is as follows:

a) determine source of the "ash-like" deposits as outlined in EMCON's preliminary report, Site History Report, which was intended to assess the nature, origin, and extent of the "ash-like" fill material at the Site;

b) identify any parties responsible for or that may have been connected to the deposition of the "ash-like" deposits and include supporting evidence; and

c) describe and support the general scope of operations for handling and deposition of the "ash-like" materials in the City of Buffalo, New York.

2.0 SITE HISTORY

Prior to 1900, the area as outlined above was a semi-rural section of Buffalo, New York, settled sparsely by New England States émigrés that used the land primarily for farming. In response to the heavy influx of Eastern Europeans post 1900, and the expansion of the railroad industry in Western New York, the target area began to show an increase in housing, light manufacturing, and heavy railroad presence. The railroad industry had a number of facilities in the general area and early land records indicate investment and ownership (see EMCON Report Table 2.2) of the target area by the railroads, or their subsidiaries. There is no indication from investigations completed that the railroads utilized the land as a dumping ground. There is no evidence that activities at small machine shops and foundries in the adjacent areas could be tied to dump activities on the Site.

The housing stocks in the adjacent neighborhood are predominately from post 1905. By the 1920's, the neighborhood had evolved to its current size.

2.1 DUMPING ACTIVITIES

The evidence compiled indicates that the City of Buffalo utilized the banks and low-lying areas adjacent to Scajaquada Creek for the purposes of dumping coal-ash collected from residences, businesses, and institutions. In particular, the area at the end of Kilhoffer Street bisected by the Creek was one of several dump sites used by the City. The EMCON report of March 1995 describes the property area in detail with Table 2.2 as a synopsis of the land use.

The Scajaquada Creek was an important storm water drainage stream that meandered through the City of Buffalo in a general east to west direction. Land development adjacent to the creek was hindered by frequent flooding and the creation of a nuisance by unauthorized dumping of all types of rubbish. Refer to the City of Buffalo, Department of Public Works (DPW) Annual Report for 1921 - Department of Engineering - pages 72-75 subsection on Sewers for additional detail.[1]

A plan was submitted on June 20, 1920 for the channelization and the building of a concrete drain from the east city line westward to Main Street, Buffalo, New York. The contract was awarded to the Buffalo Dredging Company in July of 1921 and work commenced October 1921. Refer to the City of Buffalo, DPW, Bureau of Engineering Annual Report for 1921, page 25.[2] Work was completed on the drain in 1925. There is no published evidence that the Site was utilized for a dump during this period.

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[1] Appendix 14 - City of Buffalo, Department of Public Works Report 1919-21.
[2] Appendix 14 - City of Buffalo, Department of Public Works Report 1919-21.

Early maps[3] clearly indicate the former location of Scajaquada Creek on the property in question was not the current location of the channelized and covered drain which is located under the present day Scajaquada Street in the target area. Filling of the old creek bed after the construction of the new drain did not occur in the same period of time that the Scajaquada Street was constructed. The street was paved in 1938-39 while the drain project was completed in 1925. The deposition of the material (ash and garbage) in the old creek channel occurred post 1925. See photographic evidence attached.[4]

2.2 CITY OF BUFFALO DISPOSAL PRACTICES

The wide-spread deposition of "ash-like" fill within the boundaries of the target area (the Site, as defined in Section 1.0) indicate a significant amount of this material was being hauled to the Site. To determine the source, nature, and extent of "ash-like" fill at the site, it is important to understand why there would be large quantities of ash being generated in the City of Buffalo and how the municipality was dealing with refuse.

Prior to 1893, private contractors placed bids with the city to haul garbage, ash, and trash. Between 1893 and 1896 the contracting firm of John Martin & Company received the contract to perform this work on the west side of Buffalo. This company had contracts with the City until 1911. The Buffalo Fertilizer Company, later International Agricultural Company, received a five-year contract in 1903, and renewed in 1908, to collect garbage, refuse, and ash (see City of Buffalo, DPW - Bureau of Streets Report of 1913-14 pages 2, 3, and 4).[5] On July 1, 1913, the contracts with John Martin & Company and Buffalo Fertilizer Company expired.

The City of Buffalo created their own collection system of 12 districts and bought out the facilities and equipment of John Martin & Company and Buffalo Fertilizer Company. Both of these companies continued for a few months under temporary contracts (refer to the City of Buffalo Council Proceedings, 1913, page 1551).[6] Under the new city district plan, "householders are required to make three separations: Ashes, floor, and yard sweepings placed in one receptacle; all garbage and vegetable matter in another; and all paper, bottles, tin cans, rubbers, rags, etc., in a third" citing from the DPW Annual Report 1913 page 4.[7]

The scope of handling refuse was enormous and by 1920, the population of the City of Buffalo was listed at 506,775 in the DPW Report for 1920, page 25.[8] The quantity of ash collected for 1920 was reported as 505,894 cubic yards (cy) or 207,508 tons from details given in the Annual

---

[3] Maps cited in this report are located in Appendix 1 and are from: 1880 - Beer's Atlas of Buffalo; 1915 - New Century Atlas of the City of Buffalo.

[4] Photographs enclosed in this report are located in Appendix 8. These photographs depict the construction activity from a distance slightly East of Bailey Avenue through the target site area and from there to a point slightly West of Grider Street at a location in the Curtiss-Wright Company Parking lot. Several additional aerial photographs from the Fairchild Aviation Services collection are included of the Kilhoffer Street site and two other dump sites in Buffalo for comparison.

[5] Appendix 13 - City of Buffalo, Department of Public Works - Bureau of Streets Report for 1913-14, pgs. 2-4.

[6] Appendix 13 - City of Buffalo, Department of Public Works - Bureau of Streets Report for 1913-14.

[7] Appendix 13 - City of Buffalo, Department of Public Works Annual Report for 1913, pg. 4.

[8] Appendix 2 - City of Buffalo, Department of Public Works Report for 1920, pg. 25, Population Report.

Statement of DPW (June 1920, page 45).[9] In 1924, 809,081 cy representing 338,667 tons of ash were being dumped. These figures are contained in the DPW Annual Report for 1924, page 37.[10] By 1929, the period when evidence began to show the involvement of the City of Buffalo on the Site, the amount of ash deposition stood at 298,000 tons, being dumped in several areas as noted in the 1919-33, DPW Reports.[11] The declining amounts indicated a change in technology as residential use of heating by natural gas began to be implemented.

Low lying areas, particularly along watersheds did not lend themselves well to development because of the frequent flooding. Raising of the area adjacent to these flood prone areas made the inexpensive land available for re-use and development. The history of dumping by the City is described in various documents and official reports dating from the commencement of the City Ash Collection Department in 1913. In 1913, Colonel Francis G. Ward, then Commissioner of Public Works, described in some detail the then current dump grounds (refer to the City of Buffalo Council Proceedings 1913 pages 1689-1695).[12] This description does not mention the target area Site. On the other hand, the ensuing annual reports from the Buffalo City Council, the Annual Engineering Reports, and the Department of Public Works, first mention City of Buffalo dumping on the Site occurring in 1929 (refer to the City of Buffalo Division of Streets DPW Annual Report, 1929-30 page 17).[13] This activity continued on the now identified Kilhoffer Street Dump Site through 1933 (refer to the City of Buffalo DPW Report 1932-33 page 19).[14]

2.3 HISTORY OF SITE OWNERSHIP

Land ownership of the Site from 1913 to 1953 has been tied to the Frank V.E. Bardol, Co., Inc. and the entities created after his death in 1925. This investigation indicates that Mr. Bardol was the Chief City Engineer for the City of Buffalo from 1898-1901. He held many companies and became quite widely known for his activities in the business community and land development. Land use records indicate the property was owned by Mr. Bardol, his companies, and his heirs during the period in question. Extensive study of the business records, and estate records do not indicate any relationship of a contractual nature with the City of Buffalo.[15] Our study shows that the actual contract records for 1925-35 were destroyed. The involvement of Mr. Bardol's successors continued on the site until dissolution of the land trust company in the early 1950's.

2.4 FIELD MATERIAL EVIDENCE

Material evidence observed at Parking Lot #4 during remedial activities performed by EMCON in 1995 determined that the fill was comprised principally of bottles which provide a dependable archaeological tool for dating purposes. The function of studying the bottles is to provide a basis

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[9] Appendix 3 - City of Buffalo Department of Public Works Annual Statement, June 1920, pg. 45.

[10] Appendix 4 - City of Buffalo Annual Report for 1924, pg. 34-37.

[11] Appendix 12 - City of Buffalo, Department of Public Works Annual Reports. 1929-1933.

[12] Appendix 5 - City of Buffalo Council Proceedings for 1913, pgs. 1689-1695.

[13] Appendix 6 - City of Buffalo, Department of Public Works, Division of Streets Annual Report 1929-30, pg.17.

[14] Appendix 12 - City of Buffalo, Department of Public Works Report 1932-33, pg.19.

[15] Appendix 10 - Deed Records, Erie County Records Department.

to determine the date(s) of deposition of the materials excavated from the same layer as the bottles. In this case, the bottles were commingled with the "ash-like" fill. The oldest bottle, a milk bottle, dates to pre 1910, while the rest of the bottles date from the 1920's to the 1930's. Milk bottles were re-used over longer periods and are not the best indicators of time passage. The other samples observed at the site are bottles designed for a single use and discarded in the household garbage. None of the bottles observed at the Site could be construed as being specific to industrial use. The bottles were determined to be solely used for consumer products. Other household garbage observed in a trench at the site contained remnants of tin cans and pieces of household artifacts. For a complete analysis of the material evidence, see Appendix 20.

3.0 SUMMARY AND CONCLUSIONS

The records attached as appendices to this report clearly indicate that the City of Buffalo was collecting ashes and dumping them at the end of Kilhoffer Street and along the borders of the abandoned Scajaquada Creek from approximately 1928-29 to 1933. While aerial photographs of the 1927-28 period point to dumping earlier, no mention occurs in official records.

Areas adjacent to the Site indicated above can be construed to have experienced similar activities since in general terms, the records indicate that causal dumping was a nuisance problem. Photographs indicated a pattern of dumping in areas now owned by Niagara Mohawk, in particular, adjacent to Kilhoffer Street. Areas outside the Buffalo City line to the east of the Site were not investigated. Photographic evidence attached indicates low lying areas as far west as Grider Street were used as dumping grounds.[16]

Material evidence collected at the site by EMCON is dateable to the period of activity by the City of Buffalo and reinforces the evidence pointing to the City as the party responsible for dumping on the Site. Analysis of these samples points to the conclusion that the bottles came from household garbage.

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[16] Appendix 8 - Photographs - 1924 - Area Photos of Drain Project.

APPENDIX B

LIMITED REMEDIATION RESULTS, NOVEMBER 1994

Wehran EMCON
Northeast

Wehran-New York, Inc.
345 Lang Boulevard, Suite 1
Grand Island, NY 14072-1601
Tel: (716) 773-1801
Fax: (716) 773-1828

November 30, 1994

Mark Napolitan, P.E.
General Motors Corporation
Environmental & Energy Staff
Argonaut A - 10th Floor
485 Milwaukee Avenue
Detroit, Michigan 48202-3220

RE: Draft Limited Lead Remediation Report
AAM Buffalo Facility
New Parts Coating Facility
WE Project No. 04853.P8

Dear Mr. Napolitan:

Wehran EMCON Northeast (Wehran EMCON) has prepared this draft report for the limited remediation effort in the area of the New Parts Coating Facility at the above-referenced site. The purpose of this work was to remove lead contaminated fill at concentrations greater than 5,000 parts per million (ppm) from the area of the New Parts Coating Facility.

To identify these areas, 22 borings (BH-6 to BH-27) were completed on an approximate 100-foot grid throughout the New Parts Coating Facility. Fill areas exhibiting concentrations greater than or equal to 5,000 ppm [based on in-field X-Ray Fluorescence (XRF) analyses] were designated for excavation and removal. Limits of excavation were based on field screening by XRF followed by confirmatory laboratory testing utilizing the 5,000 ppm criteria.

Specific work later completed was:

1. Retained SLC to perform the removal.
2. Retained Upstate Laboratories, Inc. to perform analytical testing.
3. Retained Waste Resource Associates, Inc. to provide an XRF instrument and operator.
4. Removed fill from area around borings BH-9 and BH-17.
5. Wehran EMCON observed the removal of fill and placement into roll-offs.
6. Collected a sample of fill for waste profiling.
7. Collected samples of fill from the excavation sidewalls for XRF field screening and confirmatory analytical testing.

The excavation generated two "full" roll-off boxes. The roll-offs are currently staged on-site. It is expected that the roll-offs will be moved off-site by December 2,1994.

Analytical laboratory results of the total lead testing from the sidewalls of the two excavations are attached. These results are preliminary as we are awaiting the laboratory's QA/QC Report. Results indicate the concentrations are less than 5,000 ppm on a dry weight basis.

The data from this effort will be incorporated into the Site History Report per the Consent Order Work Plan.

Should you need any additional information, please contact the undersigned.

Very truly yours,

WEHRAN-NEW YORK, INC.

Raymond F. Laport

Raymond F. Laport, P.E.
Senior Project Manager

Kenneth C. Malinowski

Kenneth C. Malinowski, Ph.D.
Office Director

/jmv
Attachments
cc: J. Braun - General Motors - Legal
B. Kogut - Bond, Schoeneck & King

Post-it® Fax Note 7671		Date 11/28	# of pages ▶ 2
To Ray Laport		From John	
Co./Dept. Welran		Co. ULI Syr	
Phone #		Phone #	
Fax # (716) 773-1828		Fax #	

DRAFT

APPROVAL:_ _ _ _
QC:_ _ _ _ _
Lab I.D.: 10170
Sampled by: Client

:31594067 Mat:Soil 04677 TP-BH-9-N 11/10/94

PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
Percent Solids	62%	11/11/94		WA6029
Total Lead	1,600mg/kgDrywt	11/28/94		X00001

:31594068 Mat:Soil 04677 TP-BH-9-E 11/10/94

PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
Percent Solids	63%	11/11/94		WA6029
Total Lead	710mg/kgDrywt	11/28/94		X00001

:31594069 Mat:Soil 04677 TP-BH-9-S 11/10/94

PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
Percent Solids	64%	11/11/94		WA6029
Total Lead	760mg/kgDrywt	11/28/94		X00001

:31594070 Mat:Soil 04677 TP-BH-9-W 11/10/94

PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
Percent Solids	62%	11/11/94		WA6029
Total Lead	1,200mg/kgDrywt	11/28/94		X00001

= Dry weight

ATE: / /

DRAFT

pstate Laboratories, Inc.
lysis Results
ort Number: 31594067
lient I.D.: WEHRAN-EMCON, GRAND ISLAND

APPROVAL:____
QC:_JH___
Lab I.D.: 10170
Sampled by: Client

D:31594075 Mat:Soil 04677 TP-BH-17-N 11/10/94

PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
Percent Solids	67%	11/11/94		WA602
Total Lead	950mg/kgDrywt	11/28/94		X0000

D:31594076 Mat:Soil 04677 TP-BH-17-E 11/10/94

PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
Percent Solids	62%	11/11/94		WA602
Total Lead	350mg/kgDrywt	11/28/94		X0000

D:31594077 Mat:Soil 04677 TP-BH-17-S 11/10/94

PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
Percent Solids	61%	11/11/94		WA602
Total Lead	1,700mg/kgDrywt	11/28/94		X00001

D:31594078 Mat:Soil 04677 TP-BH-17-W 11/10/94

PARAMETERS	RESULTS	DATE ANAL.	KEY	FILE#
Percent Solids	62%	11/11/94		WA602
Total Lead	4,300mg/kgDrywt	11/28/94		X00001

w = Dry weight

APPENDIX C

WASTE MANIFESTS

48-14-1 (3/89)—7f

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS SUBSTANCES REGULATION

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

Please print or type. Do not Staple.

Form Approved. OMB No. 2050-0039. Expires 9-30-94

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the N.Y. Dept. of Environmental Conservation (518) 457-7362.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA No. NYD002127165 Manifest Document No.
2. Page 1 of
Information in the shaded are is not required by Federal La

A. State Manifest Document No. NYB 473416 2

B. Generator's ID

3. Generator's Name and Mailing Address
AMERICAN AXLE & MANUFACTURING
1001 E. DELAVAN AVE.
BUFFALO, NEW YORK 14215-3148

4. Generator's Phone (**716 891-7065**

5. Transporter 1 (Company Name) **FRANK'S VACUUM TRUCK SVC., INC.**
6. US EPA ID Number **NYD982792814**

C. State Transporter's ID 34[illegible]

D. Transporter's Phone ( )

7. Transporter 2 (Company Name)
8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone ( )

9. Designated Facility Name and Site Address
CWM CHEMICAL SERVICES, INC.
1550 BALMER ROAD
MODEL CITY, N.Y. 14107

10. US EPA ID Number **NYD049836679**

G. State Facility's ID

H. Facility's Phone ( )

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, HAZARDOUS WASTE SOLID, N.O.S., 9, NA3077, III (CONTAINS LEAD, POLYCHLORINATED BIPHENYLS) (D008)	2	DM	[illegible]	K	EPA ~~B008~~ STATE B007
b.					EPA STATE
c.					EPA STATE
d.					EPA STATE

J. Additional Descriptions for Materials listed Above
a
b
c
d

K. Handling Codes for Wastes Listed Above
a T
b
c
d

15. Special Handling Instructions and Additional Information
CWM EMERGENCY RESPONSE INFROMATION (800) 424-9300 **ERG#171** **S.R.3**
PROFILE BL:304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE: 8/7/96
CERTIFICATE OF DISPOSAL REQUIRED
PCB WT. <0.1K

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and a classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governme regulations and state laws and regulations.

If I am a large quantity generator, I certify that I have program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economica practicable and that I have selected the practicable method treatment, storage, or disposal currently available to me which minimizes the present and future threat to hum health and the environment; OR if I am a small generator, I have made a good faith effort to minimize my waste and select the best waste management method that is availa to me and that I can afford. on Behalf of American Axle

Printed/Typed Name [illegible]
Signature [illegible]
Mo. 08 Day 07 Y 9

TRANSPORTER

17. Transporter 1 (Acknowledgement of Receipt of Materials)
Printed/Typed Name [illegible]
Signature [illegible]
Mo. 08 Day Y

18. Transporter 2 (Acknowledgement or Receipt of Materials)
Printed/Typed Name
Signature
Mo. Day Y

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name
Signature
Mo. Day Y

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

3594

[redacted]

FRANK'S VACUUM TRUCK SERVICE, INC.
4500 Royal Avenue • Niagara Falls, New York 14303
(716) 284-2132

NYDEC #9A-332
EPA ID # NYD982792814

PICK UP

NAME: AMERICAN AXLE
STREET: 1001 E. DELEVAN
CITY: BUFFALO, STATE: NY ZIP CODE:
CONTACT NAME: 891-7065
SCHEDULED TIME: 08/07/96 9:30
ADDITIONAL INFORMATION:

DELIVERY

NAME: CHEMICAL WASTE MGT.
STREET: 1550 BALMER ROAD
CITY: MODEL CITY STATE: NY ZIP C 14107
CONTACT NAME: FRED
SCHEDULED TIME: 08/07/96
ADDITIONAL INFORMATION:

CUSTOMER P.O. NO. 714562-1	WORK ORDER NUMBER	MANIFEST NUMBER [illegible]	BILLING REFERENCE CHM51
LOAD NUMBER 12354	TRACTOR NUMBER 19	TRAILER NUMBER 117-B	DRIVER'S NAME MIKE LEARN

NUMBER & TYPES	WEIGHT OR VOLUME	HAZ. MAT.	DESCRIPTION OF WASTE(S) PER 49 CFR	CUSTOMER CODE
[illegible]	[illegible]	X	[illegible]	

TYPE (CIRCLE ONE)
TANK (S/S) (R/L)
VAC
DUMP
VAN
ROLL-OFF
FLATBED

PLACARDS PROVIDED OR AFFIXED
[illegible]

SHIPPER'S CHECK LIST
☐ DOT LABELS APPLIED AND SECURE
☐ DOT AUTHORIZED CONTAINERS
☐ PROPER DOT NAME ON ALL PACKAGES
☐ CHECKED FOR PROPER SEALING

WHEN "RQ" QUANTITY RELEASED INTO ENVIRONMENT, IMMEDIATELY NOTIFY NAT. RESPONSE CENTER - 800-424-8802 AND 911 EMERGENCY SYSTEM OR LOCAL OPERATOR

[illegible]

CHECK SHIPPING PAPER FOR PROPER EMERGENCY RESPONSE GUIDE NUMBER

PICK UP

ARRIVAL DATE [illegible]
ARRIVAL TIME [illegible] AM [✓ PM] RELEASE TIME [illegible] [✓ AM] PM
TRAILER EMPTY UPON ARRIVAL (If not, explain below) ☐ YES ☑ NO
DIP MEASUREMENT (Tankers Only) ________ INCHES
COMMENTS: (EXPLAIN ALL DELAYS)
[illegible]

SHIPPERS CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

X ________ Title

DELIVERY

DRIVER ________ DATE ________
ARRIVAL TIME ________ AM PM RELEASE TIME ________
TRAILER EMPTY UPON DEPARTURE (If not, explain below) ☐ YES ☐ NO
COMMENTS: (EXPLAIN ALL DELAYS)

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

X

bFc business forms consultants, inc. For Reorder call (716) 838-4532

CWMHAZ.DOC

MISCELLANEOUS INVOICE / SHIPPER NUMBER

PLEASE REFER TO THIS NUMBER ON ALL YOUR DOCUMENTS CONCERNING THIS SHIPMENT.

No. 70979

American Axle & Manufacturing, Inc.
World Headquarters
1840 Holbrook
Detroit, Michigan 48212
DUNS 80-884-4567

PLEASE REMIT TO:

American Axle & Manufacturing, Inc.
P.O. Box 360254
Pittsburgh, PA 15251-6254

☐ CONSIGNM
☒ XX PAYABLE
☐ RECEIVAB

JGL

SHIPPED FROM: BUFFALO
PLANT LOCATION 81 & 83
PLANT NUMBER

CHARGE TO
GENERAL MOTORS CORP
3400 MOUND RD
WARREN, MICHIGAN 48090

SHIPPED TO
CWM CHEMICAL SERVICES
1550 BALMER RD
MODEL CITY, NY 14107

TERMS - American Axle & Manufacturing, Inc.
Standard Terms

DATE BILLED 8/7/96	CONTAINER TYPE ~~TRUCKLOADS~~ DRUMS	NO. OF CONT. 2	FREIGHT	SHIPPED VIA-PICKUP CARRIER/CAR NO. CWM CHEMICAL SERVICES INC
DATE SHIPPED	BILL OF LADING NO.	REFERENCE/AUTHORIZED BY REQ 12326 BY-K SMITH		GROSS / TARE / NE

PURCHASE ORDER NO.	PART NUMBER	DESCRIPTION	QUANTITY SHIPPED	UNIT PRICE	TOTAL AMOUNT
PROJ# 04853 ON BEHALF OF AMERICAN AXLE MFG		AMERICAN AXLE & MFG, BUFFALO, NY [illegible] SOIL , GM REMEDIATION OF LOT#4 RQ, HAZARDOUS WASTE, SOLID, N.O.S. 9, NA-3077 III (CONTAINS LEAD, D-008) POLYCHLORINATED BIPHENYLS (B007)			

HAZARDOUS

CC:GENERAL STORES

SHIPPED FROM:
AMERICAN AXLE & MF
1001 E. DELAVAN AV
BUFFALO, NY 14215

CARRIER SIGNATURE

"Seller represents that with respect to the production of the articles covered by this invoice, it has fully complied with the provisions of the Fair Labor Standards Act of 1938, as amended."

AAM 1171 REV 12-93

ORIGINAL INVOICE MAIL COPY
P.S.I.C. DATA ENTRY ONLY

ACTION CODE ____
REPORT INDICATOR ____
ACTIVITY AMOUNT

CUST. CODE/TYPE ____
ACTIVITY CODE ____
DOCUMENT REF #

(See Reverse Side for Instructions)

JO N° [illegible]

48-14-1 (3/89)—7f

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS SUBSTANCES REGULATION

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

NON-HAZARDOUS
FOR TRACKING PURPOSES

Please print or type. Do not Staple.

Form Approved. OMB No. 2050-0039. Expires 9-30-91

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA No. NYD002127165 Manifest Document No. 09770

2. Page 1 of

Information in the shaded areas is not required by Federal Law.

3. Generator's Name and Mailing Address
AMERICAN AXLE AND MANUFACTURING
1001 E. DELAVAN AVE
BUFFALO NEW YORK 14215-3148

4. Generator's Phone (716) 891-7065

A. State Manifest Document No. NY B 272371 5

B. Generator's ID

5. Transporter 1 (Company Name) FRANKS VACUUM TRUCK SERVICE INC

6. US EPA ID Number NYD982792814

C. State Transporter's ID 80346V NY

D. Transporter's Phone 716 284-213

7. Transporter 2 (Company Name)

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone ( )

9. Designated Facility Name and Site Address
CWM CHEMICAL SERVICES INC
1550 BALMER RD
MODEL CITY NY 14107

10. US EPA ID Number NYD049836679

G. State Facility's ID

H. Facility's Phone ( )

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. NON-REGULATED WATER (PROFILE BL-1374)	1	TT	5000	G	EPA STATE
b.					EPA STATE
c.					EPA STATE
d.					EPA STATE

J. Additional Descriptions for Materials listed Above

a

b

c

d

K. Handling Codes for Wastes Listed Above

a ☐ c ☐

b ☐ d ☐

15. Special Handling Instructions and Additional Information
NON-REGULATED WATER
EMERGENCY CONTACT: 716-891-7111

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.

If I am a large quantity generator, I certify that I have program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR if I am a small generator, I have made a good faith effort to minimize my waste and select the best waste management method that is available to me and that I can afford. ON BEHALF OF AMERICAN AXLE

Printed/Typed Name John G. LAWRONCE

Signature John G Lawrence

Mo Day Y 08 07 9

TRANSPORTER

17. Transporter 1 (Acknowledgement of Receipt of Materials)

Printed/Typed Name RICHARD PILS

Signature Richard Pils

Mo. Day Y 08 07 9

18. Transporter 2 (Acknowledgement of Receipt of Materials)

Printed/Typed Name

Signature

Mo. Day Y

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Mo. Day Y

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the N.Y. Dept. of Environmental Conservation (518) 457-7362.

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

3593

DATE 8/7

FRANK'S VACUUM TRUCK SERVICE, INC.
4500 Royal Avenue • Niagara Falls, New York 14303
(716) 284-2132

NYDEC #9A-332
EPA ID # NYD982792814

PICK UP — SHIPPER

NAME: AMERICAN AXLE
STREET: 1001 E. DELEVAN
CITY: BUFFALO STATE: NY ZIP CODE:
CONTACT NAME: 891-7065
SCHEDULED TIME: 08/07/96 11:00 AM ~~[illegible]~~
ADDITIONAL INFORMATION:

DELIVERY — CONSIGNEE

NAME: CHEMICAL WASTE MANAGEMENT
STREET: 1550 BALMER ROAD
CITY: MODEL CITY STATE: NY ZIP: 14107
CONTACT NAME:
SCHEDULED TIME: 08/07/96 12:30 PM
ADDITIONAL INFORMATION:

CUSTOMER P.O. NO.: 314555-1
WORK ORDER NUMBER:
MANIFEST NUMBER: NYB 2723715
BILLING REFERENCE: CWM51
LOAD NUMBER: 13247
TRACTOR NUMBER: 31
TRAILER NUMBER: 403-V
DRIVER'S NAME: RICK PILS

NUMBER & TYPES	WEIGHT OR VOLUME	HAZ. MAT.	DESCRIPTION OF WASTE(S) PER 49 CFR	CUSTOMER CODE
1TT	EST 5000G		NON-REGULATED WATER	

TYPE (CIRCLE ONE)
TANK (S/S) (R/L)
[✓ VAC]
DUMP
VAN
ROLL-OFF
FLATBED

PLACARDS PROVIDED OR AFFIXED

SHIPPER'S CHECK LIST
☐ DOT LABELS APPLIED AND SECURE
☐ DOT AUTHORIZED CONTAINERS
☐ PROPER DOT NAME ON ALL PACKAGES
☐ CHECKED FOR PROPER SEALING

WHEN "RQ" QUANTITY RELEASED INTO ENVIRONMENT, IMMEDIATELY NOTIFY NAT. RESPONSE CENTER - 800-424-8802 AND 911 EMERGENCY SYSTEM OR LOCAL OPERATOR

CHECK SHIPPING PAPER FOR PROPER EMERGENCY RESPONSE GUIDE NUMBER

PICK UP

ARRIVAL DATE 8/7/96
ARRIVAL TIME 11 00 [✓ AM] PM RELEASE TIME 2 00 AM [✓ PM]
TRAILER EMPTY UPON ARRIVAL (If not, explain below) ☒ YES ☐ NO
DIP MEASUREMENT (Tankers Only) ________ INCHES
COMMENTS: (EXPLAIN ALL DELAYS)
WAIT LOAD PAPERWORK

SHIPPERS CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

X

DELIVERY

DRIVER ________ DATE ________
ARRIVAL TIME ________ AM PM RELEASE TIME ________
TRAILER EMPTY UPON DEPARTURE (If not, explain below) ☐ YES ☐ NO
COMMENTS: (EXPLAIN ALL DELAYS)

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

GSCMR

MISCELLANEOUS INVOICE / SHIPPER NUMBER

PLEASE REFER TO THIS NUMBER ON ALL YOUR DOCUMENTS CONCERNING THIS SHIPMENT ▶ **No. 709770**

erican Axle & Manufacturing, Inc.
World Headquarters
1840 Holbrook
Detroit, Michigan 48212
DUNS 80-884-4567

PLEASE REMIT TO:

American Axle & Manufacturing, Inc.
P.O. Box 360254
Pittsburgh, PA 15251-6254

☐ CONSIGNMENT
☐ PAYABLE DEBIT
XX RECEIVABLE INV.

SHIPPED FROM:
PLANT LOCATION BUFFALO NY
PLANT NUMBER 81 & 83

JGL

AFTER INVENTORY

CHARGE TO
GENERAL MOTORS CORPORATION
3400 MOUND RD
WARREN, MICHIGAN 48090

SHIPPED TO
CWM CHEMICAL SERVICES, INC
1550 BALMER RD
MODEL CITY, NY 14107

TERMS - American Axle & Manufacturing, Inc.
Standard Terms

DATE BILLED	CONTAINER TYPE	NO. OF CONT.	FREIGHT	SHIPPED VIA-PICKUP CARRIER/CAR NO.		
	TANKER	1	COLLECT			
DATE SHIPPED	**BILL OF LADING NO.**	**REFERENCE/AUTHORIZED BY**		**GROSS**	**TARE**	**NET**
2/7/96		REQ 12327 BY K SMITH				

PURCHASE ORDER NO.	PART NUMBER	DESCRIPTION	QUANTITY SHIPPED	UNIT PRICE	TOTAL AMOUNT
PO# GM/WEHRAN PROJ# 04853		SHIPPED FROM AMERICAN AXLE MFG BUFFALO, NEW YORK TANKS OF WATER FROM GM REMEDIATION OF LOT# 4 DEWATERING NON REGULATED MATERIAL (PCB) CONTAMINATED GROUNDWATER NON REGULATED CONCENTRATION BL1374			
NON HAZARDOUS		CC: GENERAL STORES		SHIPPED FROM: AMERICAN AXLE & MFG, IN 1001 E. DELAVAN AVE BUFFALO, NY 14215	

CARRIER SIGNATURE ____________________

"Seller represents that with respect to the production of the articles covered by this invoice, it has fully complied with the provisions of the Fair Labor Standards Act of 1938, as amended."

AAM 1171 REV 12-93

P.S.I.C. DATA ENTRY ONLY

ACTION CODE ____________
REPORT INDICATOR ____________
ACTIVITY AMOUNT ____________
REV/ACCT. CLASS. ____________

CUST. CODE/TYPE ____________
ACTIVITY CODE ____________
DOCUMENT REF # ____________
DEBIT CODE ____________

29009

FRANK'S VACUUM TRUCK SERVICE, INC.
4500 Royal Avenue • Niagara Falls, New York 14303
(716) 284-2132

NYDEC #9A-332
EPA ID # NYD982792814

PICK UP

NAME: AMERICAN AXLE
STREET: SCAJAQUADA STREET
CITY: BUFFALO STATE: NY ZIP CODE:
CONTACT NAME:
SCHEDULED TIME: 03/24/95
ADDITIONAL INFORMATION:

DELIVERY

NAME: CHEMICAL WASTE MANAGEMENT
STREET: 1550 BALMER ROAD
CITY: MODEL CITY STATE: NY ZIP CODE: 14107
CONTACT NAME:
SCHEDULED TIME:
ADDITIONAL INFORMATION:

CUSTOMER P.O. NO.: 2C48-7
WORK ORDER NUMBER:
MANIFEST NUMBER:
BILLING REFERENCE: CWM51
LOAD NUMBER: 9259
TRACTOR NUMBER: 15
TRAILER NUMBER: 501-S
DRIVER'S NAME: Frank Jurek III

NUMBER & TYPES	WEIGHT OR VOLUME	HAZ. MAT.	DESCRIPTION OF WASTE(S) PER 49 CFR	
1TT	5000 gl		purged groundwater	

TYPE (CIRCLE ONE)
[✓ TANK (S/S)] (R/L)
VAC
DUMP
VAN
ROLL-OFF
FLATBED

PLACARDS PROVIDED OR AFFIXED

SHIPPER'S CHECK LIST
DOT LABELS APPLIED AND SECURE
DOT AUTHORIZED CONTAINERS
PROPER DOT NAME ON ALL PACKAGES
CHECKED FOR PROPER SEALING

WHEN "RQ" QUANTITY RELEASED INTO ENVIRONMENT, IMMEDIATELY NOTIFY NAT. RESPONSE CENTER - 800-424-8802 AND 911 EMERGENCY SYSTEM OR LOCAL OPERATOR

CHECK SHIPPING PAPER FOR PROPER EMERGENCY RESPONSE GUIDE NUMBER

PICK UP

ARRIVAL DATE 3-24-95
ARRIVAL TIME 11:30 AM RELEASE TIME 2:30 PM
TRAILER EMPTY UPON ARRIVAL (If not, explain below) ☑ YES ☐ NO
DIP MEASUREMENT (Tankers Only) 44 INCHES
COMMENTS: (EXPLAIN ALL DELAYS)
[illegible]

SHIPPERS CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

X M Bauman Title
SHIPPER'S SIGNATURE

DELIVERY

DRIVER DICK ME[illegible] DATE 3-25-95
ARRIVAL TIME 7:00 AM RELEASE TIME
TRAILER EMPTY UPON DEPARTURE (If not, explain below) ☐ YES ☐ NO
COMMENTS: (EXPLAIN ALL DELAYS) [illegible]

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.
X

29010

[redacted]

FRANK'S VACUUM TRUCK SERVICE, INC.
4500 Royal Avenue • Niagara Falls, New York 14303
(716) 284-2132

NYDEC #9A-332
EPA ID # NYD982792814

PICK UP

NAME: AMERICAN AXLE
STREET: SCAJAQUADA STREET
CITY: BUFFALO STATE: NY ZIP CODE:
CONTACT NAME:
SCHEDULED TIME: 03/24/95
ADDITIONAL INFORMATION:

DELIVERY

NAME: CHEMICAL WASTE MANAGEMENT
STREET: 1550 BALMER ROAD
CITY: MODEL CITY STATE: NY ZIP CODE: 14107
CONTACT NAME:
SCHEDULED TIME:
ADDITIONAL INFORMATION:

CUSTOMER P.O. NO.: [illegible]
WORK ORDER NUMBER:
MANIFEST NUMBER: BL 707949
BILLING REFERENCE: CWM51
LOAD NUMBER: 9258
TRACTOR NUMBER: 31
TRAILER NUMBER: 903-S
DRIVER'S NAME: Clarence Clarke

NUMBER & TYPES	WEIGHT OR VOLUME	HAZ. MAT.	DESCRIPTION OF WASTE(S) PER 49 CFR
1 T	5000 G		NON Regulated ground water

TYPE (CIRCLE ONE)
[✓ TANK (S/S)] (R/L)
VAC
DUMP
VAN
ROLL-OFF
FLATBED

PLACARDS PROVIDED OR AFFIXED

SHIPPER'S CHECK LIST
☑ DOT LABELS APPLIED AND SECURE
☑ DOT AUTHORIZED CONTAINERS
☑ PROPER DOT NAME ON ALL PACKAGES
☑ CHECKED FOR PROPER SEALING

WHEN "RQ" QUANTITY RELEASED INTO ENVIRONMENT, IMMEDIATELY NOTIFY NAT. RESPONSE CENTER - 800-424-8802 AND 911 EMERGENCY SYSTEM OR LOCAL OPERATOR

CHECK SHIPPING PAPER FOR PROPER EMERGENCY RESPONSE GUIDE NUMBER

PICK UP

ARRIVAL DATE 3 24 95
ARRIVAL TIME 11 30 AM [✓ PM] RELEASE TIME 3 30 AM [✓ PM]
TRAILER EMPTY UPON ARRIVAL (If not, explain below) ☒ YES ☐ NO
DIP MEASUREMENT (Tankers Only) ______ INCHES
COMMENTS: (EXPLAIN ALL DELAYS)
loading and paper work

SHIPPERS CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

X ______ Title ______
SHIPPER'S SIGNATURE

DELIVERY

DRIVER ______ DATE 3-25-95
ARRIVAL TIME 7 00 [✓ AM] PM RELEASE TIME ______ AM PM
TRAILER EMPTY UPON DEPARTURE (If not, explain below) ☐ YES ☐ NO
COMMENTS: (EXPLAIN ALL DELAYS)
unloaded and paper work

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

X ______
CONSIGNEE'S SIGNATURE

Chemical Waste Management, Inc.

Northeast Region
4400 River Road
Tonawanda, NY 14150
716/879-0600

WORK ORDER #

DATE 3-25-95

TRACTOR 31

TRAILER 9035

PICK UP

SHIPPER

NAME American Axle & Manufacturing

STREET 1001 E. Delavan Avenue

CITY Buffalo STATE NY ZIP CODE 14215

CONTACT NAME

SCHEDULED TIME

ADDITIONAL P/U INFORMATION

DELIVERY

CONSIGNEE

NAME CWM Chemical Services, Inc.

STREET 1550 Balmer Road

CITY Model City STATE NY ZIP CODE 14107

CONTACT NAME

SCHEDULED TIME

ADDITIONAL INFORMATION

PRODUCT CODE	MATERIAL DESCRIPTION	QUANTITY
BL1374	Non regulated material	5000 G
	(PCB contaminated groundwater)	
	SHIPPER # 707962	
	M. Hughes	

GROSS

TARE

NET

HEALTH FLAMMABILITY REACTIVITY WATER

SHIPPERS RECOMMENDED PLACARD: (CIRCLE)

NON-FLAMMABLE

FLAMMABLE SOLID ☐ LIQUID ☐

CORROSIVE

POISON

DRIVE SAFELY

PCB

DANGEROUS

OTHER

PICK UP

ARRIVAL TIME 12:30 AM [✓ PM] RELEASE TIME 2:00 AM [✓ PM]

TRAILER EMPTY UPON ARRIVAL (If not, explain below) ☒ YES ☐ NO

DIP MEASUREMENT (Tankers Only) ________ INCHES

COMMENTS: (EXPLAIN ALL DELAYS) loading and paper work

'E UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS . AND COMPLETE.

X Clarence Clarke
DRIVER'S SIGNATURE

X Dennis Hoyt
SHIPPER'S SIGNATURE

FIRM EMCON

3/24/95

DELIVERY

DRIVER C. Clark DATE 3 25 95

ARRIVAL TIME 3:00 AM [✓ PM] RELEASE TIME ________ AM PM

TRAILER EMPTY UPON DEPARTURE (If not, explain below) ☐ YES ☐ NO

COMMENTS: (EXPLAIN ALL DELAYS) Spot Loaded Trailer

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

X Clarence Clarke
DRIVER'S SIGNATURE

X Nathan G. Sikerman
CONSIGNEE'S SIGNATURE

FIRM CWM

3-25-95

HAZMAT

ENVIRONMENTAL GROUP, INC.
60 Commerce Drive, Buffalo, NY 14218
FAX (716) 827-7217
(716) 827-7200

HAZMAT

NYDEC # 9A-278
EPA ID# NYD980769947

DATE 82390
4/18

PICK UP

SHIPPER

NAME AMERICAN AXLE
STREET SCAJAQUADA ST
CITY BUFFALO STATE NY ZIP CODE 14228
CONTACT NAME
PHONE
SCHEDULED TIME 04/18/95 08:00 0 GROUND WATER

ADDITIONAL INFORMATION
. 90E TO MILLERSPORT 263 TO BAILEY AVE (RT62) TO SCAJAQUADA ST
(1ST SIGNAL LIGHT, PAST EAST DELEVAN) RIGHT ON SCAJAQUADA ST TO
PARKING LOT AT END ON RIGHT

X ¢
.10 per gallon
$425 per trip 663 723

DELIVERY

CONSIGNEE

NAME CWM CHEMICAL SERVICES
STREET 1550 BALMER RD.
CITY MODEL CITY STATE NY ZIP CODE 14107
CONTACT NAME
PHONE

[redacted]

Pursuant to 6NYCRR 372.2 (b)(2)(ii), HAZMAT certifies that it is authorized to deliver this shipment of manifested waste to the TSDF listed on this Bill of Lading

ADDITIONAL INFORMATION
(TLDS TO CWM-OBEY ALL SPEED LIMITS-NO CONVOYING-NO
JAKE-BRAKING-NO STOPPING ALONG RT-RT. 18 N MAY BE USED ON
LEAVING AND ONLY WHEN INSTR BY GUARD ARRIVE AT YOUR SCHED
TIME-BLACK OUT HOURS 7:30AM-9AM & 2:15PM -3:45PM-OBEY ALL
RULES-ATTN DRIVER'S WITH DP OR RO LDS DEL INTO MC,NY-YOU'LL
CLEAN ALL DEBRI FROM THE TAILGATE AREA PRIOR TO LEAVING(GF
SILICONE SEALANT)

PURCHASE ORDER NO.	WORK ORDER NUMBER	MANIFEST NUMBER	H.M. NUMBER
210184	210184	707963	51076
LOAD NUMBER	**TRACTOR NUMBER**	**TRAILER NUMBER**	**DRIVER'S NAME**
51076	119	SS37	JOHN HOULIHAN

TYPE (CIRCLE ONE)	MATERIAL DESCRIPTION	QUANTITY
STRAIGHT TRUCK [✓ TANK (S/S)] VAC DUMP VAN ROLL-OFF BOX # ______ FLATBED	NON REGULATED MATERIAL WASTE WATER 13294P-NY	1 TT 5,636 G

PICK UP

PICK UP DATE 4-18-95
ARRIVAL TIME 0800 AM PM RELEASE TIME 1225 AM PM
DAY # 2 DATE
ARRIVAL TIME AM PM RELEASE TIME AM PM
TRAILER EMPTY UPON ARRIVAL ☑ YES ☐ NO
(If not, explain below—)
DIP MEASUREMENT (Tankers Only) 58 1/2 INCHES
COMMENTS: (EXPLAIN ALL DELAYS) Wait To Load
Load Held Ted suck off water
From C.W.M Boxes Help Load Teds
Tank Paper work

MAT MATERIALS USED (ex. overpacks, etc): ☐ YES ☒ NO
IF YES EXPLAIN:

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

M. Hughes 4/18/95
SHIPPER'S SIGNATURE Date

DELIVERY

DRIVER John Houlihan DAY #1 DATE 4-18-95
ARRIVAL TIME 13:23 AM PM RELEASE TIME AM PM
DAY #2 DATE ARRIVAL TIME AM PM RELEASE TIME AM PM
DAY #3 DATE ARRIVAL TIME AM PM RELEASE TIME AM PM
TRAILER CLEAN AND EMPTY UPON DEPARTURE ☐ YES ☐ NO
(If not, explain below—)
COMMENTS: (Explain all delays or discrepancies) Wait To
unload - Scale - unload - Scale Paper
work.

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

Wilkinson
CONSIGNEE'S SIGNATURE Date

HAZMAT

IVIRONMENTAL GROUP, INC.
Commerce Drive, Buffalo, NY 14218

FAX (716) 827-7217
(716) 827-7200

HAZMAT

NYDEC # 9A-278
EPA ID# NYD980769947

DATE 4 18 95

82387

ICK UP

MERICAN AXLE

STREET
CAJAQUADA ST

CITY UFFALO STATE NY ZIP CODE 14223

CONTACT NAME

PHONE

SCHEDULED TIME
04/18/95 08:00 0 GROUND WATER

ADDITIONAL INFORMATION
VE TO MILLERSPORT 263 TO BAILEY AVE (RT62) TO SCAJAQUADA ST (HAS SIGNAL LIGHT, PAST EAST DELEVAN) RIGHT ON SCAJAQUADA ST TO PARKING LOT AT END ON RIGHT
80' OF HOSE OK!

Had To wait To get paperwork signed - Not allowed in Plant because of construction

DELIVERY

CONSIGNEE

NAME
CWM CHEMICAL SERVICES

STREET
1550 BALMER RD.

CITY MODEL CITY STATE NY ZIP CODE 14107

CONTACT NAME

PHONE

[redacted]

Pursuant to 6NYCRR 372.2 (b)(2)(ii), HAZMAT certifies that it is authorized to deliver this shipment of manifested waste to the TSDF listed on this Bill of Lading

ADDITIONAL INFORMATION
ALL LDS TO CWM-OBEY ALL SPEED LIMITS-NO CONVOYING-NO JAKE-BRAKING-NO STOPPING ALONG RT-RT. 18 N MAY BE USED ONLY WHE LEAVING AND ONLY WHEN INSTR BY GUARD ARRIVE AT YOUR SCHED TIME-BLACK OUT HOURS 7:30AM-9AM & 2:15PM-3:45PM-OBEY ALL SITE RULES-ATTN DRIVER'S WITH DP OR RO LDS DEL INTO MC,NY-YOU MUST CLEAN ALL DEBRI FROM THE TAILGATE AREA PRIOR TO LEAVING(GREASE SILICONE SEALANT)

PURCHASE ORDER NO. 210183

WORK ORDER NUMBER 210183

MANIFEST NUMBER Non-Hz 707964

H.M. NUMBER 51074

LOAD NUMBER 51074

TRACTOR NUMBER 80

TRAILER NUMBER V53

DRIVER'S NAME JED SHOWERS

T (CIRCLE ONE)	MATERIAL DESCRIPTION	QUANTITY
STRAIGHT TRUCK TANK (S/S) [✓ VAC] DUMP VAN ROLL-OFF BOX # ______ FLATBED	Non-Regulated Material PCB Contaminated Groundwater Non-Regulated	5700g

ICK UP

CK UP DATE 4/18/95

RRIVAL TIME 0800 [✓ AM] PM RELEASE TIME 1430 AM [✓ PM]

AY # 2 DATE ______

RRIVAL TIME ______ AM PM RELEASE TIME ______ AM PM

AILER EMPTY UPON ARRIVAL ☒ YES ☐ NO
not, explain below—)

P MEASUREMENT (Tankers Only) 55 1/4 INCHES

OMMENTS: (EXPLAIN ALL DELAYS) Vac out of Frack Tank
low off into John Holahans Tank - Vac water off
p of tops of Roll-off Boxes per Foreman - Vac
on load out of Frack Tank - Paperwork -
hn Holahan signed and helped drag hoses ABOVE

Z MATERIALS USED (ex. overpacks, etc): ☐ YES ☒ NO

YES EXPLAIN:

THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS UE AND COMPLETE.

hael Hughes 4-18-95

IPPER'S SIGNATURE Date

DELIVERY

DRIVER Jon Showers DAY #1 DATE 4/18/95

ARRIVAL TIME 1515 AM [✓ PM] RELEASE TIME 1815 AM [✓ PM]

DAY #2 DATE ______ ARRIVAL TIME ______ AM PM RELEASE TIME ______ AM PM

DAY #3 DATE ______ ARRIVAL TIME ______ AM PM RELEASE TIME ______ AM PM

TRAILER CLEAN AND EMPTY UPON DEPARTURE ☐ YES ☐ NO
(If not, explain below—)

COMMENTS: (Explain all delays or discrepancies)

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

CONSIGNEE'S SIGNATURE Date

LOAD #

TERMINAL # 01.

WORK ORDER #

BUFFALO FUEL CORP.

(716) 773-1921

2470 Allen Avenue Niagara Falls, New York 14303

DUMPS
ROLL-OFFS
VAC TANKERS
BULK TANKERS
BOX VANS
FLATBEDS
LOWBOYS

PICK UP DATE 4-18-95	TRUCK OWNER ▸	**DELIVERY DATE** 4-18-95	TRUCK OWNER ▸
DRIVER ▸ C. Colvin	DRIVER NO. ▸ Coc	DRIVER ▸ SAME	DRIVER NO. ▸
TRUCK NO. ▸ 387	TRAILER NO. ▸ UT-4	TRUCK NO. ▸	TRAILER NO. ▸

SHIPPER

NAME American Axle
STREET
CITY Buffalo, STATE NY ZIP CODE
CONTACT NAME
SCHEDULED TIME

CONSIGNEE

NAME CWM
STREET
CITY Modal City, STATE NY ZIP CODE
CONTACT NAME
SCHEDULED TIME

ADDITIONAL INFO / EQUIP NEEDED

ADDITIONAL INFO / EQUIP NEEDED

PRODUCT CODE	COMMODITY / MATERIAL DESCRIPTION	QUANTITY	
	Non Regulated Material	4945	LBS ☐ TONS ☐ GALLONS ☒ YARDS ☐

LOADING ORIGIN	PRIOR DELIVERY LOCATION	INVOICE

ROLL OFF BOX ▸	SPOTTED: PICKED UP:	FREIGHT BILL NO. (OFFICE USE ONLY)

COMMENTS

	$
RATE	
HOLDING TIME HRS. @ / HR.	
VACUUM TIME HRS. @ / HR.	
RENTAL DAYS @ / DAY	
BAG LINER ☐ YES ☐ NO	
OTHER CHGS.	
SALES TAX	
TRANSPORT TAX	
TOTAL AMOUNT	

PICK UP

ARRIVAL TIME 930 [✓ AM] PM RELEASE TIME 215 AM [✓ PM]

TRAILER EMPTY UPON ARRIVAL (If not, explain below) ☒ YES ☐ NO

DIP MEASUREMENT (Tankers Only) 52 (4945gal) INCHES

COMMENTS: (EXPLAIN ALL DELAYS AND / OR LOADING TIME)
1 hour Vac Time Used
Wait for Paperwork

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

X Charlie Olson
DRIVER'S SIGNATURE

X Michael J. Hughes AAM-BFLO
SHIPPER'S SIGNATURE FIRM

DELIVERY

DRIVER C. Colvin DATE 4-18-95

ARRIVAL TIME 320 AM [✓ PM] RELEASE TIME 630 AM [✓ PM]

TRAILER EMPTY UPON DEPARTURE (If not, explain below) ☒ YES ☐ NO

COMMENTS: (EXPLAIN ALL DELAYS AND / OR LOADING TIME)
TRAILER RINSED OUT. LAB + Empty

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

X Charlie Olson
DRIVER'S SIGNATURE

X
CONSIGNEE'S SIGNATURE FIRM

HAZMAT

ENVIRONMENTAL GROUP, INC.
0 Commerce Drive Buffalo, NY 14218

FAX (716) 827-7217
(716) 827-7200

HAZMAT

NYDEC # 9A-278
EPA ID# NYD980769947

DATE 4 19

82448

UP	DELIVERY

SHIPPER

NAME AMERICAN AXLE

STREET SCAJAQUADA ST

CITY BUFFALO STATE NY ZIP CODE 14228

CONTACT NAME

PHONE

SCHEDULED TIME 04/19/95 07:00 0 GROUND WATER

ADDITIONAL INFORMATION
290E TO MILLERSPORT 263 TO BAILEY AVE (RT62) TO SCAJAQUADA ST
(HAS SIGNAL LIGHT, PAST EAST DELEVAN) RIGHT ON SCAJAQUADA ST TO
PARKING LOT AT END ON RIGHT

4/18 4:40PM PER FRED MOVE PU FROM 8AM TO 7AM-OK

CONSIGNEE

NAME CWM CHEMICAL SERVICES

STREET 1550 BALMER RD.

CITY MODEL CITY STATE NY ZIP CODE 14107

CONTACT NAME

PHONE

[redacted]

Pursuant to 6NYCRR 372.2 (b)(2)(ii), HazMat certifies that it is authorized to deliver this shipment of manifested waste to the TSDF listed on this Bill of Lading

ADDITIONAL INFORMATION
ALL LDS TO CWM-OBEY ALL SPEED LIMITS-NO CONVOYING-NO
JAKE-BRAKING-NO STOPPING ALONG RT-RT. 18 N MAY BE USED ONLY
LEAVING AND ONLY WHEN INSTR BY GUARD ARRIVE AT YOUR SCHED
TIME-BLACK OUT HOURS 7:30AM-9AM & 2:15PM - 3:45PM-OBEY ALL
RULES-ATTN DRIVER'S WITH DP OF RO LDS DEL INTO MC,NY-YOU MU
CLEAN ALL DEBRI FROM THE TAILGATE AREA PRIOR TO LEAVING(GRE
SILICONE SEALANT)

PURCHASE ORDER NO. 210187

WORK ORDER NUMBER 21018

MANIFEST NUMBER 707966

H.M. NUMBER 51078

LOAD NUMBER 51078

TRACTOR NUMBER 119

TRAILER NUMBER 5537

DRIVER'S NAME JOHN HOULIHAN

PE (CIRCLE ONE)	MATERIAL DESCRIPTION	QUANTITY
STRAIGHT TRUCK [✓ TANK (S/S)] VAC DUMP VAN ROLL-OFF BOX # ______ FLATBED	NON REGULATED MATERIAL PCB CONTAMINATED GROUNDWATER	4,634G

PICK UP

PICK UP DATE John Houlihan

ARRIVAL TIME 07:30 AM PM RELEASE TIME 09:00 AM PM

DAY # 2 DATE ______

ARRIVAL TIME ______ AM PM RELEASE TIME ______ AM PM

TRAILER EMPTY UPON ARRIVAL ☑ YES ☐ NO
(If not, explain below—)

DIP MEASUREMENT (Tankers Only) 56' INCHES

COMMENTS: (EXPLAIN ALL DELAYS) Load + Paper work.

MAT MATERIALS USED (ex. overpacks, etc): ☐ YES ☑ NO

IF YES EXPLAIN:

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

I Forgot To Get Signature 4-19-95 JH.

SHIPPER'S SIGNATURE Date

DELIVERY

DRIVER John Houlihan DAY #1 DATE 4-19-95

ARRIVAL TIME 11:45 AM PM RELEASE TIME 16:30 AM PM

DAY #2 DATE ______ ARRIVAL TIME ___ AM PM RELEASE TIME ___ AM PM

DAY #3 DATE ______ ARRIVAL TIME ___ AM PM RELEASE TIME ___ AM PM

TRAILER CLEAN AND EMPTY UPON DEPARTURE ☑ YES ☐ NO

(If not, explain below—)

COMMENTS: (Explain all delays or discrepancies) CK in-Scale. Get Sample wait To unload - unload - Scale Paper work.

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

4-19-95

CONSIGNEE'S SIGNATURE Date

HAZMAT

ENVIRONMENTAL GROUP, INC.
60 Commerce Drive, Buffalo, NY 14218

FAX (716) 827-7217
(716) 827-7200

HAZMAT

NYDEC # 9A-278
EPA ID# NYD980769947

DATE **82446**

7/4 19/

PICK UP — **SHIPPER**

NAME AMERICAN AXLE
STREET SCAJAQUADA ST
CITY BUFFALO STATE NY ZIP CODE 14228
CONTACT NAME PHONE
SCHEDULED TIME 04/19/95 07:00 0 GROUND WATER

ADDITIONAL INFORMATION
290E TO MILLERSPORT 263 TO BAILEY AVE (RT62) TO SCAJAQUADA ST
(HAS SIGNAL LIGHT, PAST EAST DELEVAN) RIGHT ON SCAJAQUADA ST TO
PARKING LOT AT END ON RIGHT
80' OF HOSE OK!
4/18- PER FRED MOVE PU FROM 9AM TO 7AM- OK

DELIVERY — **CONSIGNEE**

NAME CWM CHEMICAL SERVICES
STREET 1550 BALMER RD.
CITY MODEL CITY STATE NY ZIP CODE 14107
CONTACT NAME PHONE

[redacted]

Pursuant to 6NYCRR 372.2 (b)(2)(ii), HazMat certifies that it is authorized to deliver this shipment of manifested waste to the TSDF listed on this Bill of Lading.

ADDITIONAL INFORMATION
ALL LDS TO CWM-OBEY ALL SPEED LIMITS-NO CONVOYING-NO
JAKE-BRAKING-NO STOPPING ALONG RT-RT. 18 N MAY BE USED ONLY
LEAVING AND ONLY WHEN INSTR BY GUARD ARRIVE AT YOUR SCHED
TIME-BLACK OUT HOURS 7:30AM-9AM & 3:15PM -3:45PM-OBEY ALL S
RULES-ATTN DRIVER'S WITH OP OR RO LDS DEL INTO MC,NY-YOU MU
CLEAN ALL DEBRI FROM THE TAILGATE AREA PRIOR TO LEAVING(GRE
SILICONE SEALANT)

PURCHASE ORDER NO.	WORK ORDER NUMBER	MANIFEST NUMBER	H.M. NUMBER
210186	210186		51077
LOAD NUMBER	**TRACTOR NUMBER**	**TRAILER NUMBER**	**DRIVER'S NAME**
51077	80	VS3	JED SHOWERS

TYPE (CIRCLE ONE)	MATERIAL DESCRIPTION	QUANTITY
STRAIGHT TRUCK TANK (S/S) [✓ VAC] DUMP VAN ROLL-OFF BOX # ______ FLATBED	Non Regulated Material FBL1374 (PCB Contaminated Ground Water)	4950 G

PICK UP

PICK UP DATE 4/19/95
ARRIVAL TIME 0700 [✓ AM] PM RELEASE TIME 1030 [✓ AM] PM
DAY # 2 DATE
ARRIVAL TIME AM PM RELEASE TIME AM PM
TRAILER EMPTY UPON ARRIVAL ☒ YES ☐ NO
(If not, explain below—)
DIP MEASUREMENT (Tankers Only) 53½ INCHES
COMMENTS: (EXPLAIN ALL DELAYS) Vac on last out of Frack Tank - Blew it off onto John Hildebrand's Trl Vac on another load for myself Paperwork

HAZMAT MATERIALS USED (ex. overpacks, etc): ☐ YES ☒ NO
IF YES EXPLAIN:

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

Michael J. Hughes
SHIPPER'S SIGNATURE Date

DELIVERY

DRIVER JED Showers DAY #1 DATE 4/19/95
ARRIVAL TIME 1115 [✓ AM] PM RELEASE TIME 1700 AM [✓ PM]
DAY #2 DATE ____ ARRIVAL TIME ____ AM PM RELEASE TIME ____ AM PM
DAY #3 DATE ____ ARRIVAL TIME ____ AM PM RELEASE TIME ____ AM PM
TRAILER CLEAN AND EMPTY UPON DEPARTURE ☒ YES ☐ NO
(If not, explain below—)
COMMENTS: (Explain all delays or discrepancies) Wait for turn to unload

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

K. Morris
CONSIGNEE'S SIGNATURE Date

LOAD # 22160.

TERMINAL # NF

ORK ORDER # 707895

BUFFALO FUEL CORP.

(716) 773-1921

2470 Allen Avenue Niagara Falls, New York 14303

DUMPS
ROLL-OFFS
VAC TANKERS
BULK TANKERS
BOX VANS
FLATBEDS
LOWBOYS

PICK UP DATE	4-19-95	TRUCK OWNER ▸		**DELIVERY DATE**	4-19-95	TRUCK OWNER ▸	
DRIVER ▸	JOHN G	DRIVER NO. ▸	GHEST	DRIVER ▸	SAME	DRIVER NO. ▸	
TRUCK NO. ▸	386	TRAILER NO. ▸	574	TRUCK NO ▸		TRAILER NO. ▸	

SHIPPER

NAME AMERICAN AXLE

STREET

CITY BUFFALO STATE NY ZIP CODE

CONTACT NAME

SCHEDULED TIME 216185

ADDITIONAL INFO / EQUIP NEEDED.

CONSIGNEE

NAME 2 WM

STREET

CITY MODEL STATE CITY NY ZIP CODE

CONTACT NAME

SCHEDULED TIME

ADDITIONAL INFO / EQUIP NEEDED.

PRODUCT CODE	COMMODITY / MATERIAL DESCRIPTION	QUANTITY			
	WATER WASTE WATER		LBS. ☐ TONS ☐ GALLONS ☐ YARDS ☐	RATE	$.
				HOLDING TIME HRS. @ / HR.	
				VACUUM TIME HRS. @ / HR.	
				RENTAL DAYS @ / DAY	
				BAG LINER ☐ YES ☐ NO	
				OTHER CHGS.	
				SALES TAX	
				TRANSPORT TAX	
				TOTAL AMOUNT	

LOADING ORIGIN	PRIOR DELIVERY LOCATION	INVOICE

ROLL OFF • BOX ▸ SPOTTED:

PICKED UP:

FREIGHT BILL NO. (OFFICE USE ONLY)

COMMENTS Ck for leaks okay 11:55am

PICK UP

ARRIVAL TIME 7:00 [✓ AM] PM RELEASE TIME 11:00 [✓ AM] PM

TRAILER EMPTY UPON ARRIVAL (If not, explain below) ☑ YES ☐ NO

DIP MEASUREMENT (Tankers Only) 50" INCHES

COMMENTS: (EXPLAIN ALL DELAYS AND / OR LOADING TIME)
700 - 930 am WAIT FOR HAZMAT
TO LOAD. 930 AM - 1030 AM VAC
[illegible] USED 1 HR TO LOAD.

THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

X
DRIVER'S SIGNATURE

X Bruce Kennedy
SHIPPER'S SIGNATURE

Emcon
FIRM

DELIVERY

DRIVER JOHN G DATE 4-19-95

ARRIVAL TIME 12:25 AM [✓ PM] RELEASE TIME 6:00 AM [✓ PM]

TRAILER EMPTY UPON DEPARTURE (If not, explain below) ☑ YES ☐ NO

COMMENTS: (EXPLAIN ALL DELAYS AND / OR LOADING TIME)
WAIT FOR TWO HAZMAT TO
UNLOAD VAC USED 1 HR
TO UNLOAD. RINSED AT TSD.

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

X
DRIVER'S SIGNATURE

X Eileen Carter
CONSIGNEE'S SIGNATURE

FIRM

HAZMAT

ENVIRONMENTAL GROUP, INC.
60 Commerce Drive, Buffalo, NY 14218
FAX (716) 827-7217
(716) 827-7200

HAZMAT

NYDEC # 9A-278
EPA ID# NYD980769947

DATE /4 2/ **82463**

PICK UP — **SHIPPER**

NAME AMERICAN AXLE
STREET SCAJAQUADA ST
CITY BUFFALO STATE NY ZIP CODE 14228
CONTACT NAME PHONE
SCHEDULED TIME 04-20-95 08:00 0 GROUND WATER

ADDITIONAL INFORMATION
...VE TO MILLERSPORT 263 TO BAILEY AVE (RT62) TO SCAJAQUADA ST *
...HAD SIGNAL LIGHT, PAST EAST DELEVAN) RIGHT ON SCAJAQUADA ST TO
PARKING LOT AT END ON RIGHT

DELIVERY — **CONSIGNEE**

NAME CWM CHEMICAL SERVICES
STREET 1550 BALMER RD.
CITY MODEL CITY STATE NY ZIP CODE 14107
CONTACT NAME PHONE

[redacted]

Pursuant to 6NYCRR 372.2 (b)(2)(ii), HAZMAT certifies that it is authorized to deliver this shipment of manifested waste to the TSDF listed on this Bill of Lading

ADDITIONAL INFORMATION
ALL LDS TO CWM-OBEY ALL SPEED LIMITS-NO CONVOYING-NO
JAKE-BRAKING-NO STOPPING ALONG RT-RT. 18 N MAY BE USED ON
LEAVING AND ONLY WHEN INSTR BY GUARD ARRIVE AT YOUR SCHED
TIME-BLACK OUT HOURS 7:30AM-9AM & 2:15PM -3:45PM-OBEY ALL
RULES-ATTN DRIVER'S WITH DP OR RO LDS DEL INTO MC,NY-YOU M
CLEAN ALL DEBRI FROM THE TAILGATE AREA PRIOR TO LEAVING(GR
SILICONE SEALANT)

PURCHASE ORDER NO. 210181	WORK ORDER NUMBER 210181	MANIFEST NUMBER 707897	H.M. NUMBER 51073
LOAD NUMBER 51073	TRACTOR NUMBER 119	TRAILER NUMBER SS37	DRIVER'S NAME JOHN HOULIHAN

TYPE (CIRCLE ONE)	MATERIAL DESCRIPTION	QUANTITY
STRAIGHT TRUCK TANK (S/S) VAC DUMP VAN ROLL-OFF BOX # ______ FLATBED	NON REGULATED MATERIAL P.C.B. CONTAMINATED WATER SHIPPER # 707897	1 TT 4,317 G

PICK UP

PICK UP DATE 4-20-95
ARRIVAL TIME 08:00 AM PM RELEASE TIME 12:00 AM PM
DAY # 2 DATE ________
ARRIVAL TIME ________ AM PM RELEASE TIME ________ AM PM
TRAILER EMPTY UPON ARRIVAL ☒ YES ☐ NO
(If not, explain below—)
DIP MEASUREMENT (Tankers Only) 47 ½ INCHES
COMMENTS: (EXPLAIN ALL DELAYS) Load & Hald Bob
Load & Put away hoses - Paper work

MAT MATERIALS USED (ex. overpacks, etc): ☐ YES ☒ NO
IF YES EXPLAIN:

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

4/20/95
SHIPPER'S SIGNATURE Date

DELIVERY

DRIVER John Houlihan DAY #1 DATE 4-20-95
ARRIVAL TIME 13:00 AM PM RELEASE TIME 16:30 AM PM
DAY #2 DATE ____ ARRIVAL TIME ____ AM PM RELEASE TIME ____ AM PM
DAY #3 DATE ____ ARRIVAL TIME ____ AM PM RELEASE TIME ____ AM PM
TRAILER CLEAN AND EMPTY UPON DEPARTURE ☐ YES ☒ NO
(If not, explain below—)
COMMENTS: (Explain all delays or discrepancies) ck IN-Scale
Sample - waited for Them To move one of
There vac Tanks off of pad so could get on
& unload - unload Paper work

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

Eileen Carter 4/20/95
CONSIGNEE'S SIGNATURE Date

HAZMAT

ENVIRONMENTAL GROUP, INC.
60 Commerce Drive, Buffalo, NY 14218

FAX (716) 827-7217
(716) 827-7200

HAZMAT

NYDEC # 9A-278
EPA ID# NYD980769947

DATE 4 [illegible]

82473

PICK UP — SHIPPER

NAME MERICAN ALE

STREET SCAJAQUADA ST

CITY BUFFALO STATE NY ZIP CODE 14228

CONTACT NAME PHONE

SCHEDULED TIME 04/20/95 08:00 0 GROUND WATER

ADDITIONAL INFORMATION [illegible] TO MILLERSPORT 263 TO BAILEY AVE (RT62) TO SCAJAQUADA ST (HAS SIGNAL LIGHT, PAST EAST DELEVAN) RIGHT ON SCAJAQUADA ST TO PARKING LOT AT END ON RIGHT

[illegible] NO HOSE OK !

13473 P NY

DELIVERY — CONSIGNEE

NAME CWM CHEMICAL SERVICES

STREET 1550 BALMER RD.

CITY MODEL CITY STATE NY ZIP CODE 1410[illegible]

CONTACT NAME PHONE

[redacted]

Pursuant to 6NYCRR 372.2 (b)(2)(ii), HAZMAT certifies that it is authorized to deliver this shipment of manifested waste to the TSDF listed on this Bill of Lading

ADDITIONAL INFORMATION ALL LDS TO CWM-OBEY ALL SPEED LIMITS-NO CONVOYING-NO JAKE-BRAKING-NO STOPPING ALONG RT-RT. 18 N MAY BE USED ON LEAVING AND ONLY WHEN INSTR BY GUARD ARRIVE AT YOUR SCHED TIME-BLACK OUT HOURS 7:30AM-9AM & 2:15PM-3:45PM-OBEY ALL RULES-WITH DRIVER'S WITH DP OR RO LDS DEL INTO MC,NY-YOU CLEAN ALL DEBRI FROM THE TAILGATE AREA PRIOR TO LEAVING(G SILICONE SEALANT)

PURCHASE ORDER NO. 210180	WORK ORDER NUMBER 210180	MANIFEST NUMBER 707896	H.M. NUMBER 51072
LOAD NUMBER 51072	TRACTOR NUMBER 56	TRAILER NUMBER VS9	DRIVER'S NAME ROBERT KAPP

TYPE (CIRCLE ONE)	MATERIAL DESCRIPTION	QUANTITY
STRAIGHT TRUCK TANK (S/S) VAC VS9 DUMP VAN ROLL-OFF BOX # ______ FLATBED	Non Reg. Material PCB Contaminated water SHIPPER # 707896	3,340 gal

PICK UP

PICK UP DATE 4-20-95

ARRIVAL TIME 0800 [✓ AM] PM RELEASE TIME 1200 AM [✓ PM]

DAY # 2 DATE VAC Time

ARRIVAL TIME ______ AM PM RELEASE TIME ______ AM PM

TRAILER EMPTY UPON ARRIVAL ☒ YES ☐ NO
(If not, explain below—)

DIP MEASUREMENT (Tankers Only) 34" INCHES

COMMENTS: (EXPLAIN ALL DELAYS) VAC LOAD - load 5537 - Vac load on VS9. PUT HOSES AWAY - PAPERWORK.

HAZMAT MATERIALS USED (ex. overpacks, etc): ☐ YES ☒ NO

IF YES EXPLAIN:

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

SHIPPER'S SIGNATURE 4/20/95 Date

DELIVERY

DRIVER Bob Kapp DAY #1 DATE 4-20-95

ARRIVAL TIME 1300 AM [✓ PM] RELEASE TIME 1715 AM [✓ PM]

DAY #2 DATE ____ ARRIVAL TIME ____ AM PM RELEASE TIME ____ AM PM

DAY #3 DATE ____ ARRIVAL TIME ____ AM PM RELEASE TIME ____ AM PM

TRAILER CLEAN AND EMPTY UPON DEPARTURE ☐ YES ☐ NO
(If not, explain below—)

COMMENTS: (Explain all delays or discrepancies) Scale in Sample unload Rinse, Scale out.

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

CONSIGNEE'S SIGNATURE 4/20/95 Date

HAZMAT

ENVIRONMENTAL GROUP, INC.
60 Commerce Drive, Buffalo, NY 14218

FAX (716) 827-7217
(716) 827-7200

HAZMAT

NYDEC # 9A-278
EPA ID# NYD980769947

DATE 85936

/ /

PICK UP

SHIPPER

NAME [illegible]

STREET [illegible]

CITY [illegible] STATE [illegible] ZIP CODE 14[illegible]

CONTACT NAME PHONE

SCHEDULED TIME [illegible] GROUND WATER

ADDITIONAL INFORMATION
[illegible] TO MILLERSPORT 263 TO BAILEY AVE (RT62) TO SCAJAQUADA ST
[illegible] RIGHT ON SCAJAQUADA ST TO
[illegible]PPING LOT AT END ON RIGHT
[illegible]!!! DRIVER MUST BRING DRUM WAND!!!

DELIVERY

CONSIGNEE

NAME CWM CHEMICAL SERVICES

STREET 1550 BALMER RD

CITY MODEL CITY STATE NY ZIP CODE 141[illegible]

CONTACT NAME PHONE

[redacted]

Pursuant to 6NYCRR 372.2 (b)(2)(ii), HAZMAT certifies that it is authorized to deliver this shipment of manifested waste to the TSDF listed on this Bill of Lading

ADDITIONAL INFORMATION
ALL LDS TO CWM-OBEY ALL SPEED LIMITS-NO CONVOYING-NO
JAKE BRAKING NO STOPPING ALONG RT RT. 18 N MAY BE USED ON
LEAVING AND ONLY WHEN INSTR BY GUARD ARRIVE AT YOUR SCHED
TIME-BLACK OUT HOURS 7:30AM-9AM & 2:15PM-3:45PM-OBEY ALL
RULES WITH DRIVER'S [illegible]
CLEAN ALL DEBRI FROM THE TAILGATE AREA PRIOR TO LEAVING(
SILICONE SEALANT)

PURCHASE ORDER NO.

WORK ORDER NUMBER

MANIFEST NUMBER 7074 9[illegible]

H.M. NUMBER 52830

LOAD NUMBER 52830

TRACTOR NUMBER 73

TRAILER NUMBER VS10

DRIVER'S NAME GARY PLATT

TYPE (CIRCLE ONE)
STRAIGHT TRUCK
TANK (S/S)
[✓ VAC]
DUMP
VAN
ROLL-OFF BOX # ______
FLATBED

MATERIAL DESCRIPTION
NON HAZ - NON Reg.

QUANTITY
1,101 gal. EST

PICK UP

PICK UP DATE 6-15-95

ARRIVAL TIME 7:45 [✓ AM] PM RELEASE TIME 10:45 AM PM

DAY # 2 DATE

ARRIVAL TIME ______ AM PM RELEASE TIME ______ AM PM

TRAILER EMPTY UPON ARRIVAL ☒ YES ☐ NO
(If not, explain below—)

DIP MEASUREMENT (Tankers Only) 14" INCHES

COMMENTS: (EXPLAIN ALL DELAYS)
LOAD From Drums

HAZMAT MATERIALS USED (ex. overpacks, etc): ☐ YES ☐ NO
IF YES EXPLAIN:

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

6-15-95

SHIPPER'S SIGNATURE Date

DELIVERY

DRIVER ______ DAY #1 DATE ______

ARRIVAL TIME ______ AM PM RELEASE TIME ______ AM PM

DAY #2 DATE ______ ARRIVAL TIME ______ AM PM RELEASE TIME ______ AM PM

DAY #3 DATE ______ ARRIVAL TIME ______ AM PM RELEASE TIME ______ AM PM

TRAILER CLEAN AND EMPTY UPON DEPARTURE ☐ YES ☐ NO
(If not, explain below—)

COMMENTS: (Explain all delays or discrepancies)

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

Mary Comfort 6/15/95

CONSIGNEE'S SIGNATURE Date

TSDF COPY

HAZMAT

NVIRONMENTAL GROUP, INC.
Commerce Drive, Buffalo, NY 14218

FAX (716) 827-7217
(716) 827-7200

HAZMAT

NYDEC # 9A-278
EPA ID# NYD980769947

DATE / /

85950

ICK UP

STREET

CITY STATE ZIP CODE

CONTACT NAME PHONE

SCHEDULED TIME

ADDITIONAL INFORMATION

DELIVERY

CONSIGNEE

NAME

STREET

CITY STATE ZIP CODE

CONTACT NAME PHONE

[redacted]

Pursuant to 6NYCRR 372.2 (b)(2)(ii), HAZMAT certifies that it is authorized to deliver this shipment of manifested waste to the TSDF listed on this Bill of Lading

ADDITIONAL INFORMATION

PURCHASE ORDER NO	WORK ORDER NUMBER	MANIFEST NUMBER NYB 9216207	H.M. NUMBER
LOAD NUMBER	TRACTOR NUMBER	TRAILER NUMBER B-16	DRIVER'S NAME

T (CIRCLE ONE)	MATERIAL DESCRIPTION	QUANTITY
STRAIGHT TRUCK TANK (S/S) VAC DUMP VAN ROLL-OFF BOX # ______ FLATBED	29 Empty Drum 10 Unused Drum 1 Drum Hg Waste	Approx 2100 lbs

PICK UP

ICK UP DATE 6-15-91

RRIVAL TIME 12:00 AM [✓ PM] RELEASE TIME 11:30 AM [✓ PM]

AY # 2 DATE ______

RRIVAL TIME ______ AM PM RELEASE TIME ______ AM PM

RAILER EMPTY UPON ARRIVAL ☐ YES ☐ NO
not, explain below—)

IP MEASUREMENT (Tankers Only) ______ INCHES

OMMENTS: (EXPLAIN ALL DELAYS)

T MATERIALS USED (ex. overpacks, etc): ☐ YES ☐ NO

YES EXPLAIN:

THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS RUE AND COMPLETE.

6-15

HIPPER'S SIGNATURE Date

DELIVERY

DRIVER T [illegible] DAY #1 DATE 6/18

ARRIVAL TIME [illegible] [✓ AM] PM RELEASE TIME 08:45 [✓ AM] PM

DAY #2 DATE ______ ARRIVAL TIME ______ AM PM RELEASE TIME ______ AM PM

DAY #3 DATE ______ ARRIVAL TIME ______ AM PM RELEASE TIME ______ AM PM

TRAILER CLEAN AND EMPTY UPON DEPARTURE ☐ YES ☐ NO

(If not, explain below—)

COMMENTS: (Explain all delays or discrepancies)

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

6/16/91

CONSIGNEE'S SIGNATURE Date

CCWM

UNIFORM HAZARDOUS WASTE MANIFEST NYD002127165 00052 1

Generator's Name and Mailing Address
AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148
Generator's Phone 716 891-7065

NY B 7094736

Transporter 1 Company Name: BUFFALO FUEL CORP
US EPA ID Number: NYD051809452
757688
500 677 500

Transporter 2 Company Name
US EPA ID Number

9. Designated Facility Name and Site Address
CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107
NYD049836679
Facility's Phone 716 754-8231

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number) | 12. Containers | 13. Total Quantity | 14. Unit Wt/Vol | Waste No.

a. RQ,Hazardous Waste Solid,N.O.S.,9,NA3077,III,(D008)(LEAD) — DT EST. 001 ~~DM~~ 35000 P — EPA D008 / STATE

b. — EPA / STATE

c. — EPA / STATE

d. — EPA / STATE

J. Additional Descriptions for Materials Listed Above
a LEAD

K. Handling Codes for Wastes Listed Above
a L
c ☐
b ☐
d ☐

15. Special Handling Instructions and Additional Information
CWM Emergency Response Information (800)765-8713 ERG#31 S.R.# 204849
PROFILE BL1305 ESTIMATE WGT ITEM #13
8135733

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste and select the best waste management method that is available to me and that I can afford. ON BEHALF OF AMERICAN AXLE + MFG INC

Printed/Typed Name: MICHAEL J. HUGHES
Signature: Michael J. Hughes
Mo. Day Year: 03 24 95

17. Transporter 1 (Acknowledgement of Receipt of Materials)
Printed/Typed Name: JOHN GIESELER
Signature: John
Mo. Day Year: 03 24 95

18. Transporter 2 (Acknowledgement of Receipt of Materials)
Printed/Typed Name
Signature
Mo. Day Year

19. Discrepancy Indication Space Sec B - "SAME"
actual recd - 46700 P

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: KATHLEEN MORRISON
Signature: Kathleen Morrison
Mo. Day Year: 03 25 95

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the N.Y. Dept. of Environmental Conservation (518) 457-7

CCWI

WASTE MANIFEST NYD002127165 00051 1

AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148

Generator's Phone 716 891-7065

NY B 7094745

Generator's ID

Buffalo Fuel Corp. NYD051209952

State Transporter's ID 55327D NY

Transporter's Phone 716 285-5101

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address

US EPA ID Number

G. State Facility's ID

CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

NYD049836679

H. Facility's Phone 716 754-8231

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
RQ,Hazardous Waste Solid,N.O.S.,9,NA3077,III, (D008)(LEAD)	001	~~DC~~ ~~EA~~ DT	EST. 35000	P	EPA D008 STATE
					EPA STATE
					EPA STATE
d.					EPA STATE

J. Additional Descriptions for Materials Listed Above

a LEAD

K. Handling Codes for Wastes Listed Above

a L c ☐

b ☐ d ☐

15. Special Handling Instructions and Additional Information

CWM Emergency Response Information (800)765-8713 ERG#31 S.R.#204846
PROFILE BL1305 ESTIMATE WGT. ITEM #13

81351331

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford. ON BEHALF OF AMERICAN AXLE + MFG INC.

Printed/Typed Name MICHAEL J. HUGHES
Signature Michael J. Hughes
Mo. Day Year 03 24 95

17. Transporter 1 (Acknowledgement of Receipt of Materials)

Printed/Typed Name DARRYL KROENING
Signature Darryl Kroening
Mo. Day Year 03 24 95

18. Transporter 2 (Acknowledgement of Receipt of Materials)

Printed/Typed Name
Signature
Mo. Day Year

19. Discrepancy Indication Space SEC B - 'SAME'
actual rec'd - 42840 P

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name Kathleen Morrison
Signature Kathleen Morrison
Mo. Day Year 03 25 95

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

ENVIRONMENTAL CONSERVATION

HAZARDOUS SUBSTANCES REGULATION

HAZARDOUS WASTE MANIFEST

Box 12820, Albany, New York 12212

CCWM

US EPA ID No. N Y D 0 0 2 1 2 7 1 6 5

Manifest Document No. 07371

2. Page 1 of 1

Information ... is not required ...

A. State Manifest Document Number NY B 8109189

B. Generator's ... SAme ⓌD6/1

AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148
716 891-7065

Chemical Waste Management Inc

US EPA ID Number ILD099202681

C. State Transporter's ID NY864072

D. Transporter's Phone (716 879-0600

US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

US EPA ID Number

G. State Facility's ID

CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

N Y D 0 4 9 8 3 6 6 7 9

H. Facility's Phone 716 754-8231

Hazard Class and ID Number) | 12. Containers No. | Type | 13. Total Quantity | 14. Unit Wt/Vol | Waste

RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III,
(CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)

EST 001 CM 32000 P

EPA D008

B007

EPA

STATE

EPA

STATE

EPA

STATE

K. Handling Codes for Wastes Listed

L

☐

81430174

CWM Emergency Response Information (800)424-9300 ERG#31 S.R.#~~224847~~/1,2
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE: 3-20-95

EST KG - 14,545

... contents of this consignment are fully and accurately described above by proper shipping name ... in proper condition for transport by highway according to applicable international and ...

... reduce the volume and toxicity of waste generated to the degree I have determined ... method of treatment, storage, or disposal currently available to me which minimizes the present ... good faith effort to minimize my waste ... select the best waste management ...

FOR THE BEHALF OF AMERICAN AXLE

JOHN G. LAWRENCE John G. Lawrence 061395

Wm. Schimschack Wm. Schimschack 061395

Actual Qty Recd 24080 P

EILEEN CARTER Eileen Carter 061395

CCWM

NYD002127165 07372 1

AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148
716 891-7065

NY B 8109126

Chemical Waste Management Inc ILD099202681

NY844322
716 8790600

CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

NYD049836679 716 754-8231

RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III,
(CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)

EST.
001CM32000P

D008
B007

L

CWM Emergency Response Information (800)424-9300
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE: 3-20-95

ERG#31

S.R.# 225067

EST
KG 14,545 81430175

ON BEHALF OF AMERICAN AXLE

John G. LAWRENCE John G. Lawrence 061395

J. KENNETH RYAN J Kenneth Ryan 061395

actual recvd 24740P

EILEEN CARTER Eileen Carter 061395

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS SUBSTANCES REGULATION

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

CCWM

UNIFORM HAZARDOUS WASTE MANIFEST

Generator's US EPA ID No. NYD002127165

Manifest Document No. 07373

2. Page 1 of 1

A. State Manifest Document Number NY B 8109099

AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148
716 891-7065

B. Generator's ID SAME

Transporter 1 Company Name CHEMICAL WASTE MANAGEMENT INC

US EPA ID Number ILC099202651

C. State Transporter's ID NY864312

D. Transporter's Phone 716 879-0620

Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

Designated Facility Name and Site Address

CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

10. US EPA ID Number NYD049836679

G. State Facility's ID

H. Facility's Phone 716 754-8231

US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III, (CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)	001	CM	EST 32000	P	EPA D008 STATE B007
					EPA STATE
					EPA STATE
					EPA STATE

J. Additional Descriptions for Materials Listed Above

K. Handling Codes for Wastes Listed Above

a L

Additional Information

CWM Emergency Response Information (800)765-8713 ERG#31 S.R.#2250664,2
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE: 3-20-95

EST KG 14,545 8143173

GENERATOR'S CERTIFICATION: [illegible] that the contents of this consignment are fully and accurately described above by proper shipping name and [illegible] according to applicable [illegible]

[illegible] program in place to reduce the volume and toxicity of waste generated to the degree [illegible] treatment, storage, or disposal currently available to me which minimizes the present and future threat [illegible] have made a good faith effort to minimize my waste and select the best waste management method [illegible]

ON BEHALF OF AMERICAN AXLE

John G. LAWRENCE John G. Lawrence 06 13 95

Robert HARVEY 06 13 95

actual receipt 24900P

EILEEN CARTER Eileen Carter 061395

HAZARDOUS WASTE MANIFEST

New York 12212

CCWM

Manifest Document No. | Page 1

NYD002127165 07374 | 1

AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148
716 891-7065

NY B 8109135

Generator's ID: SAME

HAZMAT ENVIRONMENTAL GROUP, INC. NYD980769947

US EPA ID Number

State Transporter's ID: 13033P (N.Y.)

Transporter's Phone: 716 827-7200

State Transporter's ID

Transporter's Phone

US EPA ID Number

State Facility's ID

CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

NYD049836679

Facility's Phone: 716 754-8231

	Containers	Total Quantity	Unit Wt/Vol	Waste No.
RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III, (CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)	001 CM	EST 32000	P	EPA D008 STATE B007
				EPA STATE
				EPA STATE

K. Handling Codes for Wastes Listed Above

L

☐

CWM Emergency Response Information (800)424-9300 ERG#31 S.R.# 225068-
843072
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE: 3-20-95

EST KG 14,545

ON BEHALF OF AMERICAN AXLE

John G. LAWRENCE John G. Lawrence 06 13 95

MICHAEL G. MYERS Michael G. Myers 06 13 95

Actual Qty Recd 20300 P

EILEEN CARTER Eileen Carter 06 13 95

FORM HAZARDOUS
WASTE MANIFEST

NYD002127165 07375 1

Generator's Name and Mailing Address
AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148

Generator's Phone 716 891-7065

NY B 8109144

Generator's ID SAME ec 6/14/95

Transporter 1 Company Name HAZMAT ENVIRONMENTAL GR. ING. US EPA ID Number NY0980769947

Transporter's B036P

Transporter's Phone 716 827-2

Transporter 2 Company Name US EPA ID Number

Transporter's Phone

Designated Facility Name and Site Address US EPA ID Number

State Facility's ID

CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

NYD049836679

Facility's Phone 716 754-8231

US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number) | Containers No. Type | Total Quantity | Unit Wt/Vol | Waste No.

RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III, (CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)

EST

001 CM 32000 P

D008

B007

b.

EPA

STATE

c.

EPA

STATE

d.

EPA

STATE

J. Additional Descriptions for Materials listed Above

a

b

c

d

K. Handling Codes for Wastes Listed Above

a L

b

c

d

81430188

15. Special Handling Instructions and Additional Information

CWM Emergency Response Information (800)424-9300 ERG#31 S.R.# 225069
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE: 3-20-95

EST KG 14,454

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.

If I am a large quantity generator, I certify that I have program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR if I am a small generator, I have made a good faith effort to minimize my waste and select the best waste management method that is available to me and that I can afford.

ON BEHALF OF AMERICAN AXLE

Printed/Typed Name JOHN G. LAWRENCE

Signature John G Lawrence

Mo. Day Ye 06 13 9

17. Transporter 1 (Acknowledgement of Receipt of Materials)

Printed/Typed Name DONALD BATT

Signature Donald Batt

Mo. Day Ye 06 13 9

18. Transporter 2 (Acknowledgement of Receipt of Materials)

Printed/Typed Name

Signature

Mo. Day Ye

19. Discrepancy Indication Space

actual recvd 21040 P / 9544 K Item 13+14 s/b kilog

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19

Printed/Typed Name EILEEN CARTER

Signature Eileen Carter

Mo. Day Ye 06 14 9

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the

48-14-1 (3/89)—7!

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS SUBSTANCES REGULATION

HAZARDOUS WASTE MANIFEST

P.O. Box 12320, Albany, New York 12212

CCWI

Please print or type. Do not Staple.

Form Approved. OMB No. 2050-0039. Expires 9-30-94

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA No. N Y D 0 0 2 1 2 7 1 6 5 Manifest Document No. 07362

2. Page 1 of 1

Information in the shaded areas is not required by Federal Law.

3. Generator's Name and Mailing Address
AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148

4. Generator's Phone (716 891-7065

A. State Manifest Document No. NY B 7058313

B. Generator's ID SAME

5. Transporter 1 (Company Name) CHEMICAL WASTE MANAGEMENT INC

6. US EPA ID Number ILD099202681

C. State Transporter's ID NY864072

D. Transporter's Phone (716 879-0622

7. Transporter 2 (Company Name)

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone (   )

9. Designated Facility Name and Site Address
CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

10. US EPA ID Number N Y D 0 4 9 8 3 6 6 7 9

G. State Facility's ID

H. Facility's Phone (716) 754-8231

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III, (CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)	001	CM	EST. 32000	P	EPA D008 STATE B007
b.					EPA STATE
c.					EPA STATE
d.					EPA STATE

J. Additional Descriptions for Materials listed Above

a

b

c

d

K. Handling Codes for Wastes Listed Above

a L

b ☐

c ☐

d ☐

15. Special Handling Instructions and Additional Information
CWM Emergency Response Information (800)765-8713 ERG#31 S.R.# 225073
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE: 3-20-95 KG 14,545 81430204

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.

If I am a large quantity generator, I certify that I have program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR if I am a small generator, I have made a good faith effort to minimize my waste and select the best waste management method that is available to me and that I can afford.

ON BEHALF OF AMERICAN AXLE

Printed/Typed Name JOHN G. LAWRENCE Signature John G. Lawrence Mo. Day Year 06 14 95

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name GARTH WILSON Signature Garth Wilson Mo. Day Year 06 14 95

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name Signature Mo. Day Year

FACILITY

19. Discrepancy Indication Space Item 13 & 14 S/B kilograms
ACTUAL QTY RECD 12728K

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name EILEEN CARTER Signature Eileen Carter Mo. Day Year 06 14 95

EPA Form 8700-22 ... Previous editions are obsolete

In case of emergency or spill immediately call the National Response Center (800) ...8802 and the N.Y. Dept. of Environmental Conservation (518) 457-7362.

48-14-1 (3/89)—

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS SUBSTANCES REGULATION

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

CCUP

Please print or type. Do not Staple.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA No.: N Y D 0 0 2 1 2 7 1 6 5 07360

Manifest Document No.: 07360

2. Page 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148

4. Generator's Phone: 716 891-7065

A. State Manifest Document No.: NY B 7058304

B. Generator's ID: SAME lc 6/14/95

5. Transporter 1 (Company Name): CHEMICAL WASTE MANAGEMENT INC

6. US EPA ID Number: ILD099202681

C. State Transporter's ID: NY864327

D. Transporter's Phone: 716 8T9 0600

7. Transporter 2 (Company Name):

8. US EPA ID Number:

E. State Transporter's ID:

F. Transporter's Phone:

9. Designated Facility Name and Site Address
CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

10. US EPA ID Number: N Y D 0 4 9 8 3 6 6 7 9

G. State Facility's ID:

H. Facility's Phone: 716 754-8231

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III, (CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)	001	CM	EST. 32000	P	EPA D008 STATE B007
b.					EPA STATE
c.					EPA STATE
d.					EPA STATE

J. Additional Descriptions for Materials Listed Above
a.
b.
c.
d. 81430214

K. Handling Codes for Wastes Listed Above
a. L
b.
c.
d.

15. Special Handling Instructions and Additional Information
CWM Emergency Response Information (800)765-8713 ERG#31 S.R.#224857
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE: 3-20-95
Ro.# 3928
EST. 14,545 KG

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford. ON BEHALF OF AMERICAN AXLE

Printed/Typed Name: JOHN G. LAWRENCE
Signature: John G Lawrence
Date: 061495

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: ROBERT J. DUNN
Signature: Robert J. Dunn
Date: 061495

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name:
Signature:
Date:

19. Discrepancy Indication Space
actual recid 13508K Item 13+14 S/B Kilograms

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: KATHI VILLENEUVE
Signature: Kathi Villeneuve
Date: 061495

GENERATOR

In case of emergency or spill, immediately call the National Response Center (800) 424-8802 and the N.Y. Dept. of Environmental Conservation (518) 457-7362.

CCWM

NYD002127165 01361 1

AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148
716 891-7065

NY B 7058322

SAME

Chemical Waste Management Inc IL-D099202681

NY 864312
716 879-06[illegible]

CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

NYD049836679 716 754-8231

RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III,
(CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)

001 CM 32000 P EST.

D008
B007

L

CWM Emergency Response Information (800)765-8713 ERG#31 S.R.# 225072
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE: 3-20-95

KG 14,545 81430203

ON BEHALF OF AMERICAN AXLE

John G. LAWRENCE John G Lawrence 061495

Robert Harley 061495

actual recd 31540P Item 13-14 S/B kilograms

EILEEN CARTER Eileen Carter 061495

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS SUBSTANCES REGULATION

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

CCW

Please print or type. Do not staple.

Form Approved

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. N Y D 0 0 2 1 2 7 1 6 5

Manifest Document No. 07363

2. Page 1 of 1

Information in the shaded areas is not required by Federal law

3. Generator's Name and Mailing Address
AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148

4. Generator's Phone: 716 891-7065

A. State Manifest Document No. NY B 7058403

B. Generator's ID SAME

5. Transporter 1 Company Name: HAZMAT ENVIRONMENTAL GROUP, INC.

6. US EPA ID Number: NYD980769947

C. State Transporter's ID 13033P (W)

D. Transporter's Phone 716 827-72C

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

10. US EPA ID Number: N Y D 0 4 9 8 3 6 6 7 9

G. State Facility's ID

H. Facility's Phone: 716 754-8231

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, HAZARDOUS WASTE SOLID, N.O.S., 9, NA3077, III, (CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)	001	CM	EST. 32000	P	EPA D008 STATE B007
b.					EPA STATE
c.					EPA STATE
d.					EPA STATE

J. Additional Descriptions for Materials Listed Above

a

b

K. Handling Codes for Wastes Listed Above

a L

b ☐

c ☐

d ☐

15. Special Handling Instructions and Additional Information

CWM Emergency Response Information (800)765-8713 ERG#31 S.R.# 225075
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE: 3-20-95 KG 14,545 814302 15

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

[illegible] volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste and select the best waste management method that is available

ON BEHALF OF AMERICAN AXLE

Printed/Typed Name: JOHN G. LAWRENCE | Signature: John G. Lawrence | 06 14 95

MICHAEL G. MYERS | Michael G. Myers | 06 14 95

Signature

Item 13 & 14 S/B in Kilograms
Actual Qty Rec'd 11413 K

KATHI VILLENEUVE | Kathi Villeneuve | 06 14 95

GENERATOR

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the N.Y. Dept. of Environmental Conservation (518) 457 7362

CCWM

NYD002127165 07369   1

AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148
716 891-7065

NY B 7058394

SAME 6/14/95

HAZMAT ENVIRONMENTAL GP INC NYD980769947

10395PNY
716 827-7200

CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

NYD049836679   716 754-8231

RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III,
(CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)

EST.
001CM32000 P

D008
B007

81430184

CWM Emergency Response Information (800)765-8713   ERG#31
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE: 3-20-95

~~SR.# [illegible]~~

EST KG 14,545

SR# 225069

ON BEHALF OF AMERICAN AXLE

JOHN G. LAWRENCE   John G Lawrence   061395

DONALD BATT   Donald Batt   061395

Item 13&14 S/B in Kilograms
actual recd 11004 K   Item K - IL

KATHI VILLENEUVE   Kathi Villeneuve   061495

48-14-1

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS SUBSTANCES REGULATION

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

CCWI

Please print or type. Do not Staple

UNIFORM HAZARDOUS
WASTE MANIFEST

Generator's US EPA ID No.: N Y D 0 0 2 1 2 7 1 6 5

Manifest Document No.: 07370

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148

4. Generator's Phone: 716 891-7065

A. State Manifest Document Number: NY B 7058295

B. Generator's ID: SAME ee 6/14/95

5. Transporter 1 Company Name: HazmatEnvironmentalGroup, Inc.

6. US EPA ID Number: NY D980769947

C. State Transporter's ID: 1287 P NY

D. Transporter's Phone: 716 827-7200

7. Transporter 2 Company Name:

8. US EPA ID Number:

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

10. US EPA ID Number: N Y D 0 4 9 8 3 6 6 7 9

G. State Facility's ID

H. Facility's Phone: 716 754-8231

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III, (CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)	001	CM	EST. 32000	P	EPA D008 STATE B007
b.					EPA STATE
c.					EPA STATE
d.					EPA STATE

J. Additional Descriptions for Materials listed Above

a

b

c

d

K. Handling Codes for Wastes Listed Above

a ☐ c ☐

b ☐ d ☐

81430185

15. Special Handling Instructions and Additional Information
CWM Emergency Response Information (800)765-8713 ERG#31 S.R.# 225070
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE:
RB# 45 3-20-95 Est. KG 14,545

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are [illegible] described above [illegible] and are classified, packed, marked and labeled, and are in all respects in proper condition for transport [illegible] regulations [illegible] and [illegible]

[illegible] I have a program in place to reduce the volume and toxicity [illegible] practicable and that I have selected the practicable method of treatment, storage, or disposal currently available [illegible] I have made a good faith effort [illegible]

ON BEHALF OF AMERICAN AXLE

Printed/Typed Name: John G. LAWRENCE Signature: John G Lawrence 061395

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Rich Borden Signature: Rich Borden 061295

18. Transporter 2 Acknowledgement of Receipt of Materials

19. Discrepancy Indication Space

actual recvd 30500P Item K-II

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name: EILEEN CARTER Signature: Eileen Carter 061495

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the N.Y. Dept. of Environmental Conservation (518) 457-7362

48-14-1 (3/89)—7f

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS SUBSTANCES REGULATION

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

CCWI

Please print or type. Do not Staple.

Form Approved. OMB No. 2050-0039. Expires 9-30-94

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. NYD002127165 Manifest Document No. 07364

2. Page 1 of 1

Information in the shaded areas is not required by Federal Law.

3. Generator's Name and Mailing Address
AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148

4. Generator's Phone (716) 891-7065

A. State Manifest Document No. NY B 7058457

B. Generator's ID SAME (ew) 6/15/95

5. Transporter 1 (Company Name) HAZMAT Environmental Grp

6. US EPA ID Number YD980769947

C. State Transporter's ID 103958 NY

D. Transporter's Phone ( )

7. Transporter 2 (Company Name)

8. US EPA ID Number

E. State Transporter's ID 71682772X

F. Transporter's Phone ( )

9. Designated Facility Name and Site Address
CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

10. US EPA ID Number NYD049836679

G. State Facility's ID

H. Facility's Phone (716) 754-8231

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III, (CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)	001	CM	EST. 32000	P	EPA D008 STATE B007
b.					EPA STATE
c.					EPA STATE
d.					EPA STATE

J. Additional Descriptions for Materials listed Above

a

b

c

d

K. Handling Codes for Wastes Listed Above

a ☐ c ☐

b ☐ d ☐

15. Special Handling Instructions and Additional Information
CWM Emergency Response Information (800)765-8713 ERG#31 S.R.# 225079
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE: 3-20-95 KG 14,545 81430253

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.

If I am a large quantity generator, I certify that I have program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR if I am a small generator, I have made a good faith effort to minimize my waste and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name ON BEHALF OF AMERICAN AXLE JOHN G. LAWRENCE Signature John G. Lawrence Mo. Day Year 061495

TRANSPORTER

17. Transporter 1 (Acknowledgement of Receipt of Materials)

Printed/Typed Name KENNETH JOYAL Signature Kenneth Joyal Mo. Day Year 061495

18. Transporter 2 (Acknowledgement of Receipt of Materials)

Printed/Typed Name Signature Mo. Day Year

FACILITY

19. Discrepancy Indication Space Actual Qty RECD 16937K

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name KATHI VILLENEUVE Signature Kathi Villeneuve Mo. Day Year 061595

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the N.Y. Dept. of Environmental Conservation (518) 457-7362.

Form 8700-22 Previous editions are obsolete.

[illegible] CONSERVATION
[illegible] SUBSTANCES REGULATION

HAZARDOUS WASTE MANIFEST

P. O. Box 12820 Albany New York 12212

CCW

Manifest

Page 1

NYD002127165 07397 1

AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148
716 891-7065

NY B 7058412

SAME

CHEMICAL WASTE MANAGEMENT INC ILC079303681

NY8645/2

716 827-66

E. State Transporter's ID

F. Transporter's Phone

G. State Facility's ID

CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

NYD049836679

Facility's Phone 716 754-8231

	12. Containers No.	13. Total Quantity		Waste No.
RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III, (CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)	001 CM	EST 32000	P	EPA D008 STATE B007
				EPA STATE
				EPA STATE
				EPA STATE

SOIL

Handling Codes for Wastes Listed Above

L ☐
☐ ☐

81430241

CWM Emergency Response Information (800)765-8713 ERG#31 S.R.# 224859/3
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE: 3-20-95 14545 KG EST.

ON BEHALF OF AMERICAN AXLE

John G. LAWRENCE John G Lawrence 061595

Robert Harvey Robt Harvey 061595

actual rec'd 29640 P/13445K Item 13+14 S/B Kilograms

EILEEN CARTER Eileen Carter 061595

HAZARDOUS WASTE MANIFEST

P.O. Box [illegible]

CCW

UNIFORM HAZARDOUS WASTE MANIFEST

NYD00212716507399

1

AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148
716 891-7065

NY B 7058439

SAME

Chemical Waste Management Inc. ILD099202681

NY864072
716879-0600

CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

NYD049836679

716 754-8231

RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III,
(CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)

EST.
001 CM 32000 P

D008
B007

SOIL

L

8143024Y

CWM Emergency Response Information (800)765-8713 ERG#31 S.R.# 224859-1-0.
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE:
R/O CAN 368-B 3-20-95 14,545 KG EST.

ON BEHALF OF AMERICAN AXLE

John G. LAWRENCE John G. Lawrence 061595

GARTH WILSON Garth Wilson 061595.

actual recd 22700 P / 10297 K

EILEEN CARTER Eileen Carter 061595

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, NY 12212

CCWM

UNIFORM HAZARDOUS WASTE MANIFEST

NYD00212716507398

1

Information in the shaded areas is not required by Federal law.

AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148
716 891-7065

NY B 7058421

SAME (DW) 6/15/95

CHEMICAL WASTE MANAGEMENT ILD099202681

C. State Transporter's ID NY864322

D. Transporter's Phone 716 879-060

E. State Transporter's ID

F. Transporter's Phone

G. State Facility's ID

CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

NYD049836679

H. Facility's Phone 716 754-8231

US DOT Description	12. Containers	13. Total Quantity	14. Unit Wt/Vol	Waste No.
RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III, (CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)	001 CM	EST 32000	P	EPA D008 STATE B007
				EPA STATE
				EPA STATE
				EPA STATE

J. Additional Descriptions for Materials Listed Above

K. Handling Codes for Wastes Listed Above

L

☐

☐

81430242

CWM Emergency Response Information (800)765-8713 ERG#31 S.R.#224857-2
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE: 3-20-95 14545 KG EST.

ON BEHALF OF AMERICAN AXLE

JOHN G. LAWRENCE John G Lawrence 061595

ROBERT J. DUNN Robert J. Dunn 061595

~~Item 13 & 14 S/B in Kilograms~~

Actual Qty Recd 16348K

EILEEN CARTER Eileen Carter 061595

Response Center (800) 424 8802 and the N.Y. Dept. of Environmental Conservation (518) 457 7362

CONSERVATION
SUBSTANCES REGULATION

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

CCWI

UNIFORM HAZARDOUS WASTE MANIFEST

NYD002127165 07366

Page 1

AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148

716 891-7065

NY B 7058484

SAME TW 6/15/95

Hazmat Environmental Group Inc NYD 980769947

C. State Transporter's ID 11282P NY
D. Transporter's Phone 716 827-7222

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address

10. US EPA ID Number

G. State Facility's ID

CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

NYD049836679

H. Facility's Phone 716 754-8231

11. US DOT Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III, (CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)	001	CM	EST. 32000	P	EPA D008 B007
					EPA STATE
					EPA STATE
					EPA STATE

K. Handling Codes for Wastes Listed Above

a. ☐ b. ☐

c. ☐ d. ☐

CWM Emergency Response Information (800)765-8713 ERG#31 S.R.# 225083

PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL

ACCUMULATION START DATE: 3-20-95 KG 14,545 8430229

ON BEHALF OF AMERICAN AXLE

JOHN G. LAWRENCE John G Lawrence 061495

Rich Borden Rich Borden 061495

Item 13&14 s/b in Kilograms Item K - L

Actual Qty Rec'd 16500 P / 7484 K

EILEEN CARTER Eileen Carter 061595

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS SUBSTANCES REGULATION

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

CCI

Please print or type. Do not staple.

Form Approved. OMB No.

UNIFORM HAZARDOUS WASTE MANIFEST

Generator's US EPA ID No.: NYD002127165

Manifest Document No.: 07368

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

Generator's Name and Mailing Address:
AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148

Generator's Phone: 716 891-7065

A. State Manifest Document No.: NY B 7058331

B. Generator's ID: SAME gc 6/16/95

Transporter 1 Company Name: HAZMAT ENVIRONMENTAL GROUP INC

US EPA ID Number: NYD980769947

C. State Transporter's ID: 13034PNY

D. Transporter's Phone: 716 827-7200

Transporter 2 Company Name:

8. US EPA ID Number:

E. State Transporter's ID:

F. Transporter's Phone:

Designated Facility Name and Site Address:
CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

10. US EPA ID Number: NYD049836679

G. State Facility's ID:

H. Facility's Phone: 716 754-8231

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III, (CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)	001	CM	EST. 32000	P	EPA D008 STATE B007
					EPA STATE
					EPA STATE
					EPA STATE

J. Additional Descriptions for Materials Listed Above

81430260

K. Handling Codes for Wastes Listed Above

a ☐ c ☐

b ☐ d ☐

15. Special Handling Instructions and Additional Information

CWM Emergency Response Information (800)765-8713 ERG#31 S.R.#224857-7
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE: 3-20-95 14545 KG EST.

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste and select the best waste management method that is available to me.

ON BEHALF OF AMERICAN AXLE

Printed/Typed Name: John G. LAWRENCE

Signature: John G Lawrence

Date: 061595

17. Transporter 1 Acknowledgement of Receipt of Materials: FRANK G ~~SAWYER~~ Frank G Sawyer 061595

18. Transporter 2 Acknowledgement of Receipt of Materials

Signature

Date

19. Discrepancy Indication Space: actual recvd 11022K Item K-II

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

KATHI VILLENEUVE Kathi Villeneuve 061695

45-14-1 (3/89)—7

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS SUBSTANCES REGULATION

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

Inc 6/Km

CCW

Please print or type. Do not Staple.

UNIFORM HAZARDOUS
WASTE MANIFEST

1. Generator's US EPA ID No. N Y D 0 0 2 1 2 7 1 6 5
Manifest Document No. ~~07365~~ 07396
2. Page 1 of 1
Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148
4. Generator's Phone (716 891-7065

A. State Manifest Document No. NY B 7058475
B. Generator's ID SAME jc 6/16/95

5. Transporter 1 (Company Name) Hazmat Environmental Group Inc
6. US EPA ID Number NYD 980769947
C. State Transporter's ID 13036 P NY
D. Transporter's Phone 716 827-7000

7. Transporter 2 (Company Name)
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107
10. US EPA ID Number N Y D 0 4 9 8 3 6 6 7 9
G. State Facility's ID
H. Facility's Phone 716 754-8231

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III, (CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)	001	CM	EST, 32000	P	EPA D008 STATE B007
b.					EPA STATE
c.					EPA STATE
d.					EPA STATE

J. Additional Descriptions for Materials listed Above
a. b. c. d. 81430259

K. Handling Codes for Wastes Listed Above
a. ☐ b. ☐ c. ☐ d. ☐

15. Special Handling Instructions and Additional Information
→ CWM Emergency Response Information (800)765-8713 ERG#31 S.R.# 225081
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE: 3-20-95
14,545 KG ~~9000~~ EST.

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.

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Printed/Typed Name JOHN G. LAWRENCE
Signature John G. Lawrence
Month Day Year 06 14 95

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name Tom Polley
Signature Tom Polley
Month Day Year 06 14 95

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature

19. Discrepancy Indication Space
actual recvd 15310 P Item K-1Z

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name KATHI VILLENEUVE
Signature Kathi Villeneuve
Month Day Year 061695

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the N.Y. Dept. of Environmental Conservation (518) 457-7362.

48-14-1 (3/89)—7

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS SUBSTANCES REGULATION

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

CCWM

Please print or type. Do not Staple.

Form Approved OMB No 2050-0039 Expires 9-30-94

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA No.: N Y D 0 0 2 1 2 7 1 6 5
Manifest Document No.: 07367
2. Page 1 of 1
Information in the shaded areas is not required by Federal Law.

3. Generator's Name and Mailing Address:
AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148

4. Generator's Phone (716) 891-7065

A. State Manifest Document No.: NY B 7058385

B. Generator's ID: SAME jc 6/16/95

5. Transporter 1 (Company Name): HAZMAT Environmental Group
6. US EPA ID Number: NYD980769947
C. State Transporter's ID: 10394 PN
D. Transporter's Phone (716 827-7200

7. Transporter 2 (Company Name):
8. US EPA ID Number:
E. State Transporter's ID: jc 6/16/9
F. Transporter's Phone ( )

9. Designated Facility Name and Site Address:
CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

10. US EPA ID Number: N Y D 0 4 9 8 3 6 6 7 9
G. State Facility's ID:
H. Facility's Phone: 716 754-8231

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III, (CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)	001	CM	EST 32000	P	EPA D008 STATE B007
b.					EPA STATE
c.					EPA STATE
d.					EPA STATE

J. Additional Descriptions for Materials Listed Above
a.
b.
c.
d.

K. Handling Codes for Wastes Listed Above
a. ☐
b. ☐
c. ☐
d. ☐

15. Special Handling Instructions and Additional Information
CWM Emergency Response Information (800)765-8713 ERG#31 S.R.# 224859-6
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE: 3-20-95 KG 14,545 81430258

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are ... and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government ... regulations.

... generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health ... I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available ...

ON BEHALF OF AMERICAN AXLE

JOHN G. LAWRENCE Signature John G. Lawrence Mo. Day Year 06 15 95

17. Transporter 1 Acknowledgement of Receipt of Materials

KENNETH JOYAL Signature Kenneth Joyal Mo. Day Year 06 15 95

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name Signature Mo. Day Year

19. Discrepancy Indication Space

actual recvd 14343 K

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

KATHI VILLENEUVE Kathi Villeneuve 06 16 95

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the N.Y. Dept. of Environmental Conservation (518) 457-7362.

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS SUBSTANCES REGULATION

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

CCWP

Please print or type. Do not Staple.

Form Approved OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. N Y D 0 0 2 1 2 7 1 6 5

Manifest Document No. 07395

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148

4. Generator's Phone (716 891-7065

A. State Manifest Document No. NY B 7058286

B. Generator's ID SAME lc 6/16/95

5. Transporter 1 Company Name Hazmat Environmental Grp

6. US EPA ID Number NY D980 769547

C. State Transporter's ID 1287PM

D. Transporter's Phone 716 822-7400

E. State Transporter's ID PA 3104

7. Transporter 2 Company Name

8. US EPA ID Number

F. Transporter's Phone ( )

9. Designated Facility Name and Site Address
CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107

10. US EPA ID Number N Y D 0 4 9 8 3 6 6 7 9

G. State Facility's ID

H. Facility's Phone (716 754-8231

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III, (CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)	001	CM	EST 32000	P	EPA D008 STATE B007
b.					EPA STATE
c.					EPA STATE
d.					EPA STATE

J. Additional Descriptions for Materials Listed Above

a.

b.

K. Handling Codes for Wastes Listed Above

a ☐ c ☐

b ☐ d ☐

15. Special Handling Instructions and Additional Information

81430266

CWM Emergency Response Information (800)765-8713 ERG#31 S.R.#__________
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE: 3-20-95 14545 KG EST

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

ON BEHALF OF AMERICAN AXLE

Printed/Typed Name John G. LAWRENCE
Signature John G. Lawrence
Mo. Day Year 061595

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name Rich Borden
Signature Rich Borden
Mo. Day Year ~~061595~~ 061495

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Mo. Day Year

19. Discrepancy Indication Space
actual recvd 12202K Item K-II

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name KATHI VILLENEUVE
Signature Kathi Villeneuve
Mo. Day Year 061695

GENERATOR

In case of emergency or spill, immediately call the National Response Center (800) 424-8802 and the N.Y. Dept. of Environmental Conservation (518) 457-7362

48-14-1 (3/89)—71

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS SUBSTANCES REGULATION

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

CCWM

Please print or type. Do not Staple.

Form Approved. OMB No. 2050-0039. Expires 9-30-94

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the N.Y. Dept. of Environmental Conservation (518) 457-7362.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA No. N Y D 0 0 2 1 2 7 1 6 5
Manifest Document No. 07396
2. Page 1 of 1
Information in the shaded areas is not required by Federal Law.

GENERATOR

3. Generator's Name and Mailing Address
AMERICAN AXLE & MANUFACTURING
1001 E DELAVAN AVE
BUFFALO NY 14215-3148
4. Generator's Phone (716) 891-7065

A. State Manifest Document No. NY B 7058466
B. Generator's ID SAME KC 6/19/95

5. Transporter 1 (Company Name) Hazmat Envirmental Group
6. US EPA ID Number NYD980769947
C. State Transporter's ID PD1949 NY
D. Transporter's Phone (716 827-7200

7. Transporter 2 (Company Name)
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone ( )

9. Designated Facility Name and Site Address
CWM CHEMICAL SERVICES, INC.
1550 BALMER RD.
MODEL CITY NY 14107
10. US EPA ID Number N Y D 0 4 9 8 3 6 6 7 9
G. State Facility's ID
H. Facility's Phone (716 754-8231

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, HAZARDOUS WASTE SOLID, N.O.S., 9,NA3077,III, (CONTAINS LEAD, POLYCHLORINATED BIPHENYLS)(D008)	001	CM	EST 32000	P	EPA D008 STATE B007
b.					EPA STATE
c.					EPA STATE
d.					EPA STATE

J. Additional Descriptions for Materials listed Above
a
b
c
d

K. Handling Codes for Wastes Listed Above
a ☐
b ☐
c ☐
d ☐

15. Special Handling Instructions and Additional Information
CWM Emergency Response Information (800)765-8713 ERG#31 S.R.#374
PROFILE BL1304, LEAD AND PCB CONTAMINATED FILL
ACCUMULATION START DATE:
8143034S 3-20-95 14,545 KG EST.

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.

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ON BEHALF OF AMERICAN AXLE

Printed/Typed Name John G. LAWRENCE
Signature John G. Lawrence
Mo. Day Year 06 15 95

TRANSPORTER

17. Transporter 1 (Acknowledgement of Receipt of Materials)
Printed/Typed Name TED Kyre
Signature Ted Kyre
Mo. Day Year 06 15 95

18. Transporter 2 (Acknowledgement of Receipt of Materials)
Printed/Typed Name
Signature
Mo. Day Year

FACILITY

19. Discrepancy Indication Space
actual recvd 26580 P/12057 K Item K-1L

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name KATTA VILLENEUVE
Signature Katta Villeneuve
Mo. Day Year 06 19 95

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

APPENDIX D

BOREHOLE LOGS

TEST PIT LOG

Test Pit No. TP-1
Sheet 1 of 1

PROJECT: *Parking Lot #4 Remedial Investigation*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Clean Harbors Environmental Services Co.*
EQUIPMENT: *42" Trench Hoe*

JOB NO.: *84853-OP2*
OBSERVER: *D.Hoyt*
OPERATOR: *T.Stampone*
W.L.REF.ELEV.: NA

DATE: *3/21/95*
G.S.ELEV.: 644.56
NS COORD.: 9353.25
EW COORD.: 9885.42

Piezometer Construction	Depth (feet)	Samples No. & Type	Log	Unified	Visual Classification
		TP-1AA Lead @ 0.5'	■		A 42" trench hoe bucket was used to excavate the test pit. The rough dimensions of the test pit were 16 feet long by 3.5 feet wide by 6.0 feet deep. The test pit was located approximately 13 feet perpendicular to the WWTP eastern fence line. The top layer from 0-1 foot consisted of asphalt and subgrade materials.
		TP-1A Lead @ 1.5'			From 1.0-2.5 feet, a layer of wet to saturated rusty, white, gray, and black ash-like material was found.
			△		From 2.5-5.0 feet, miscellaneous construction and demolition debris, bottles, metal screening, clothing, and general household waste were encountered. Large amounts of perched water discharged from this layer. Groundwater was encountered at a depth of approximately 3 feet.
	5			CH	A layer of organic silt was observed from 5.0 to 5.5 feet.
			▨	CL	Gray clay encountered at a depth of approximately 5.5 feet.
					Bottom of test pit excavation at 6.0 feet.

TEST PIT LOG

Test Pit No. TP-2

Sheet 1 of 1

PROJECT: *Parking Lot #4 Remedial Investigation*	JOB NO.: *84853-0P2*	DATE: *3/21/95*
CLIENT: *General Motors Corporation*	OBSERVER: *D.Hoyt*	G.S.ELEV.: 644.51
CONTRACTOR: *Clean Harbors Environmental Services Co.*	OPERATOR: *T.Stampone*	NS COORD.: 9409.21
EQUIPMENT: *42" Trench Hoe*	W.L.REF.ELEV.: NA	EW COORD.: 9891.32

Piezometer Construction	Depth (feet)	Samples No. & Type	Log	Unified	Visual Classification
		TP-1AA Lead @ 0.5 ft	■		A 42" trench hoe bucket was used to excavate the test pit. The rough dimensions of the test pit were 25 feet long by 3.5 feet wide by 6.0 feet deep. The test pit was located approximately 13 feet perpendicular to the WWTP eastern fence line. The top layer from 0-1 foot consisted of asphalt and subgrade materials.
		TP-1A Lead @ 1.5 ft			From 1.0-3.0 feet, a layer of wet to saturated rusty, white, gray, and black ash-like material was found. Groundwater was encountered at a depth of approximately 3 feet.
			△		From 3.0-4.5 feet, miscellaneous construction and demolition debris, bottles, metal screening, clothing, and general household waste were encountered. Large amounts of perched water discharged from this layer.
	5			CH	A layer of organic silt was observed from 4.5 to 5.5 feet.
			▨	CL	Gray clay encountered at a depth of approximately 5.5 feet.
					Bottom of test pit excavation at 6.0 feet.

Wehran EnviroTech

LEGEND FOR BORING LOGS

PROJECT: Parking Lot #4 Site Investigation

PROJECT NO.: 85740-000.000

BORING NO.: BL-95-1 to 16, BL-96-1 to 7, MW-200 to 207,RW-95-1

GRAPHIC SYMBOL	SOIL/ROCK CODE	DESCRIPTION OF SYMBOLS USED IN LITHOLOGIC LOG COLUMN
■	Asphalt	ASPHALT PAVEMENT
◇	Fill	FILL MATERIAL
⁘	Ash	ASH FILL
▨	CL	INORGANIC CLAY
┄	CH	SILT
▧	SM	SILTY SAND
○	GC	GRAVEL
▦	Ls	LIMESTONE

SYMBOL or PATTERN	DESCRIPTION OF SYMBOLS USED IN WELL CONSTRUCTION AND SAMPLE SYMBOLS
▩	Cement Grout
◇	Backfill With Cuttings
▧	Bentonite Pellets
⁘	Sand Pack
☰	Well Sreen
⊠	Split-Spoon Sample
◧	Bedrock Core Run

EMCON

BORING/WELL NO. BL-96-1

SHEET 1 of 1

PROJECT: Parking Lot #4 Remedial Investigation
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.
PROJECT NO: 65740-000.000
RIG: CME-75

GS ELEV:
N-S COORD:
E-W COORD:
WL REF ELEV: NA
DATE STARTED: 03/28/96
DATE FINISHED: 03/28/96
OPERATOR: S. Gingrich
GEOLOGIST: K. Galanti

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
		S-1 S-1R	☒	3 8	7			Pavement subbase. Stone in spoon. Take second spoon. Loose, gray, white, yellow, black fine to medium to coarse sand, woood, brick, damp.	
		S-2	☒	8	4			Loose, gray, white, orange fine to medium to coarse sand, black cinders, wood, brick, moist.	
	5	S-3	☒	6	7			Loose, gray, white, orange fine to medium to coarse sand, ash, glass, black cinders, wood, wet.	S-3 sent for PCB analysis.
		S-4	☒	6	2			Very loose, orange, white, gray, black fine to medium sand, ash, wood, some shale, saturated.	
		S-5	☒	4	1			Very loose, black fine sand, trace silt, brick, porcelain, saturated.	
	10	S-6	☒	8	51/10"	▨	CH	Very soft, black fine silt, little fine gravel.	
							CL	Very soft, gray-green, silty clay. Spoon refusal @ 10.85'.	
								Bottom of boring at 10.85 feet.	
	15								
	20								
	25								

EMCON

BORING/WELL NO. BL-96-2

SHEET 1 of 1

PROJECT: *Parking Lot #4 Remedial Investigation*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Earth Dimensions, Inc.*
PROJECT NO: *85740-000.000*
RIG: *CME-75*

GS ELEV:
N-S COORD:
E-W COORD:
WL REF ELEV: *NA*
DATE STARTED: *03/28/96*
DATE FINISHED: *03/28/96*
OPERATOR: *S. Gingrich*
GEOLOGIST: *K. Galanti*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
▨						■		Pavement subbase.	
▨		S-1	☒	16	32	⁘		Dense, black, orange, gray fine to medium to coarse sand, cinders, ash, damp.	
▨		S-2	☒	3	3	⁘		Very loose, black, orange, gray fine to medium to coarse sand, ash, fine gravel, cinders, coke, moist.	S-2 sent for lead analysis.
▨	5	S-3	☒	4	5	┄	CH	Soft, gray to black silt, little clay, wet. Same to 6.5'.	
▨		S-4	☒	12	3	▨	CL	Soft, gray silty clay.	
								Bottom of boring at 8.0 feet.	
	10								
	15								
	20								
	25								

EMCON

BORING/WELL NO. BL-96-3

SHEET 1 of 1

PROJECT: *Parking Lot #4 Remedial Investigation*
PROJECT NO: *65740-000.000*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Earth Dimensions, Inc.*
RIG: *CME-75*

GS ELEV:
N-S COORD:
E-W COORD:
WL REF ELEV: *NA*
DATE STARTED: *03/28/96*
DATE FINISHED: *03/28/96*
OPERATOR: *S. Gingrich*
GEOLOGIST: *K. Galanti*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
▨		S-1	⊠	12	26			Medium dense, gray to black fine to medium to coarse sand and fine gravel, trace brown silty clay, dry.	
▨		S-2	⊠	3	5			Loose, gray to brown fine to medium sand, fine gravel, trace brown silty clay, dry.	
▨						▨	CL	Very stiff, reddish brown silty clay to 4.75'.	
▨	5	S-3	⊠	18	17	☰	ML	Gray-green silt, some clay.	
								Bottom of boring at 6.0 feet.	
	10								
	15								
	20								
	25								

EMCON

BORING/WELL NO. BL-96-4

SHEET 1 of 1

PROJECT: *king Lot #4 Remedial Investigation*

CLIENT: *General Motors Corporation*

CONTRACTOR: *Earth Dimensions, Inc.*

PROJECT NO: *85740-000.000*

RIG: *CME-75*

GS ELEV:

N-S COORD:

E-W COORD:

WL REF ELEV: *NA*

DATE STARTED: *03/28/96*

DATE FINISHED: *03/28/96*

OPERATOR: *S. Gingrich*

GEOLOGIST: *K. Galanti*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
		S-1	☒	6	23			Medium dense, brown to gray, fine to medium to coarse sand and fine gravel, brick, wood, dry.	
		S-2	☒	3	7			. Loose, brown fine to medium sand and fine gravel, some brick, little clay, damp.	
	5	S-3	☒	8	7		ML	Medium stiff, red-brown silt, some clay.	
		S-4	☒	18	7			Medium stiff, red-brown silt, some clay to 7.75'.	
							CL	Gray-green silty clay.	
								Bottom of boring at 8.0 feet.	
	10								
	15								
	20								
	25								

EMCON

BORING/WELL NO. BL-96-5

SHEET 1 of 1

PROJECT: *Parking Lot #4 Remedial Investigation*
PROJECT NO: *85740-000.000*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Earth Dimensions, Inc.*
RIG: *CME-75*

GS ELEV:
N-S COORD:
E-W COORD:
WL REF ELEV: *NA*
DATE STARTED: *03/28/96*
DATE FINISHED: *03/28/96*
OPERATOR: *S. Gingrich*
GEOLOGIST: *K. Galanti*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
		S-1		10	14			Medium dense, brown to gray, fine to medium to coarse sand and fine gravel, little brown clay, brick, slag, dry.	
		S-2		6	8		ML	Medium stiff, reddish-brown silt, some clay, dry.	
	5	S-3		12	15			Stiff, reddish-brown silt, some clay, dry.	
		S-4		12	6			Medium stiff, reddish-brown silt, some clay to 7.0'.	
							CL	Medium stiff, gray-green silty clay.	
								Bottom of boring at 8.0 feet.	
	10								
	15								
	20								
	25								

BORING/WELL NO. BL-96-6

SHEET 1 of 1

PROJECT: Parking Lot #4 Remedial Investigation
PROJECT NO: 85740-000.000
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.
RIG: CME-75

GS ELEV:
N-S COORD:
E-W COORD:
WL REF ELEV: NA
DATE STARTED: 03/28/96
DATE FINISHED: 03/28/96
OPERATOR: S. Gingrich
GEOLOGIST: K. Galanti

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
▨		S-1	☒	14	14			Medium dense, gray to black, fine to medium to coarse sand and fine gravel, slag, brown clay at tip of spoon.	
▨		S-2	☒	4	10			Medium dense, gray to brown, fine to medium sand, brick, fine gravel.	Sample S-2 sent for lead analysis.
▨	5	S-3	☒	8	20			Medium dense, brown to dark gray fine to medium sand and fine gravel, saturated.	
▨						▨	CL	Medium stiff, reddish brown clay, some silt.	
								Bottom of boring at 6.0 feet.	
	10								
	15								
	20								
	25								

EMCON

BORING/WELL NO. BL-96-7

SHEET 1 of 1

PROJECT: Parking Lot #4 Remedial Investigation
PROJECT NO: 85740-000.000
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.
RIG: CME-75

GS ELEV:
N-S COORD:
E-W COORD:
WL REF ELEV: NA
DATE STARTED: 03/28/96
DATE FINISHED: 03/28/96
OPERATOR: S. Gingrich
GEOLOGIST: K. Galanti

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
		S-1	☒	14	14			Medium dense, black, gray, brown fine to medium sand, fine gravel, brick, trace brown clay, moist.	
		S-2	☒	6	10			Medium dense, black, gray, brown fine to medium sand, fine gravel, brick, trace brown clay, wet at tip of spoon.	Sample S-2 sent for lead analysis.
	5	S-3	☒	10	55			Very dense, brown to gray fine gravel and fine to medium sand, saturated.	
		S-4	☒	6	13		CH	Soft, brown silt to 6.25'.	
							CL	Stiff, reddish-brown silty clay, saturated.	
								Bottom of boring at 8.0 feet.	
	10								
	15								
	20								
	25								

EMCON

BORING/WELL NO. MW-205

SHEET 1 of 1

PROJECT: *Parking Lot #4 Remedial Investigation*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Earth Dimensions, Inc.*

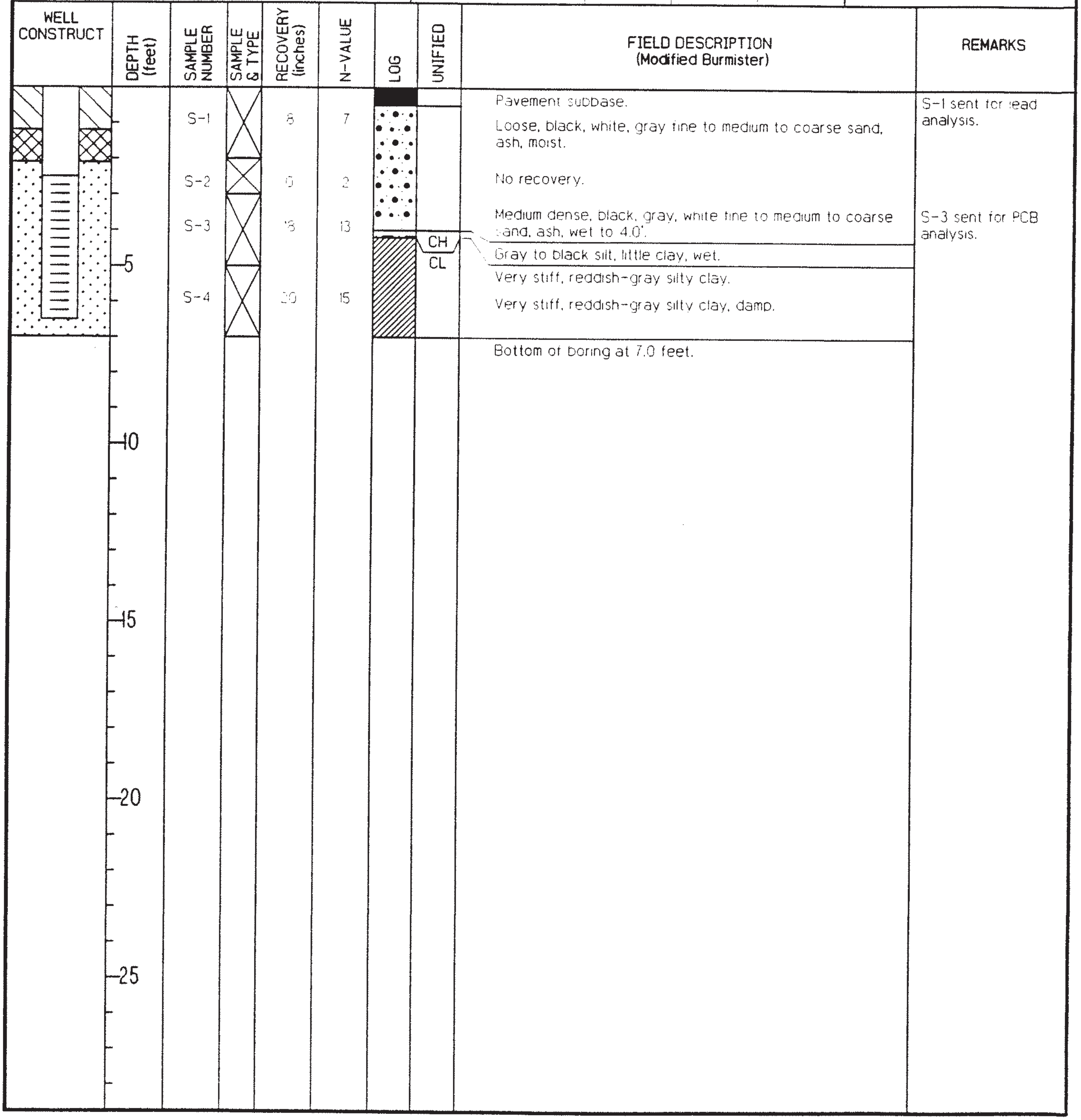
PROJECT NO: *85740-000.000*
RIG: *CME-75*

GS ELEV:
N-S COORD:
E-W COORD:
WL REF ELEV: *NA*
DATE STARTED: *07/11/96*
DATE FINISHED: *07/11/96*
OPERATOR: *S. Gingrich*
GEOLOGIST: *D. Hoyt*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	*NA*	*NA*	*NA*

	CASING	SAMPLE	TUBE	CORE
TYPE	*HSA*	*SS*		
DIAM.	*4.25"*	*2"*		
WEIGHT		*140#*		
FALL		*30"*		



SAMPLE NUMBER	RECOVERY (inches)	N-VALUE	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
				Pavement subbase.	
S-1	8	7		Loose, black, white, gray fine to medium to coarse sand, ash, moist.	S-1 sent for lead analysis.
S-2	0	2		No recovery.	
S-3	18	13		Medium dense, black, gray, white fine to medium to coarse sand, ash, wet to 4.0'.	S-3 sent for PCB analysis.
			CH	Gray to black silt, little clay, wet.	
			CL	Very stiff, reddish-gray silty clay.	
S-4	20	15		Very stiff, reddish-gray silty clay, damp.	
				Bottom of boring at 7.0 feet.	

EMCON

BORING/WELL NO. MW-206

SHEET 1 of 1

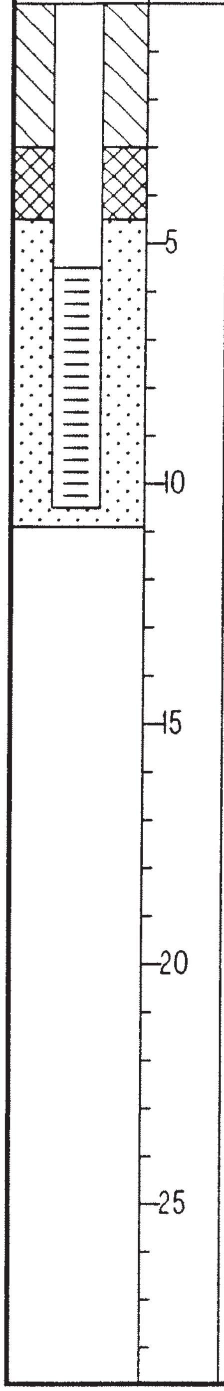
PROJECT: Parking Lot #4 Remedial Investigation
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.
PROJECT NO: 85740-000.000
RIG: CME-75

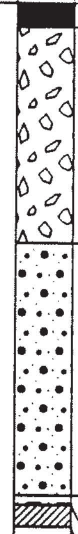
GS ELEV:
N-S COORD:
E-W COORD:
WL REF ELEV: NA
DATE STARTED: 07/11/96
DATE FINISHED: 07/11/96
OPERATOR: S. Gingrich
GEOLOGIST: D. Hoyt

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	4.25"	2"		
WEIGHT		140#		
FALL		30"		





SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
					Auger to 1.0' through pavement and cement.	
S-1	☒	9	9		Loose, gray fine gravel, cement subbase, dry.	
S-2	☒	[illegible]	8		Loose, gray fine gravel, cement subbase, dry.	
S-3	☒	3	3		Very loose, gray, white, orange fine to medium to coarse sand, ash, glass, black cinders, wood, wet.	S-3 sent for Lead analysis.
S-4	☒	5	6		Very loose, orange, white, gray, black fine to medium sand, ash, wood, some shale, saturated.	S-4 sent for PCB analysis.
S-5	☒	8	7		Very loose, black fine sand, trace silt, brick, saturated.	
				CH	Black fine silt, little fine gravel.	
				CL	Very soft, gray-green, silty clay. Spoon refusal @ 10.9'.	
					Bottom of boring at 10.9 feet.	

EMCON

BORING/WELL NO. MW-207

SHEET 1 of 1

PROJECT: *Parking Lot #4 Remedial Investigation*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Earth Dimensions, Inc.*
PROJECT NO: *85740-000.000*
RIG: *CME-75*

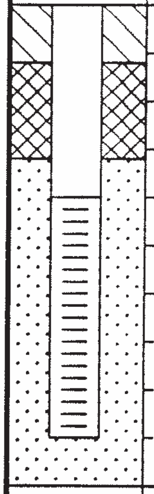
GS ELEV:
N-S COORD:
E-W COORD:
WL REF ELEV: *NA*
DATE STARTED: *09/09/96*
DATE FINISHED: *09/09/96*
OPERATOR: *S. Gingrich*
GEOLOGIST: *K. Galanti*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	4.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT



LOG

DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
						Pavement base.	
	S-1	☒	12	20		Medium dense, black, gray, brown fine to medium sand, fine gravel, brick, trace brown clay, dry.	
	S-2	☒	15	70		Loose, black, gray, brown fine to medium sand, fine gravel, brick, trace brown clay, dry to 3.5'. Changes to brown silty clay, some fine gravel to 3.8'. Changes to black and orange slag, moist to 4.0'.	
5	S-3	☒	12	10		Medium dense, brown to gray fine gravel and fine to medium sand, wet.	
					CH	Brown silt, little fine sand at 5.7', wet.	
	S-4	☒	12	17		Medium dense, brown silt, little fine sand, trace fine gravel, wet.	
					CL	Very stiff, reddish-brown silty clay, saturated.	
	S-5	☒	15	4		Very stff, reddish-brown silty clay, saturated.	
10						Bottom of boring at 10.0 feet.	
15							
20							
25							

LEGEND FOR BORING LOGS

PROJECT: Parking Lot #4 Remedial Investigation

PROJECT NO.: 04853.P2

BORING NO.: BL-95-1 thru BL-95-16, MW-200 thru MW-204, RW-95-1

GRAPHIC SYMBOL	SOIL/ROCK CODE	DESCRIPTION OF SYMBOLS USED IN LITHLOGIC LOG COLUMN
■	Asphalt	ASPHALT PAVEMENT
◇	Fill	FILL MATERIAL
⁘	Ash	ASH FILL
▨	CL	INORGANIC CLAY
┄	CH	SILT
▧	SM	SILTY SAND
○	GC	GRAVEL
▦	Ls	LIMESTONE

SYMBOL or PATTERN	DESCRIPTION OF SYMBOLS USED IN WELL CONSTRUCTION AND SAMPLE SYMBOLS
▩	Cement Grout
◇	Backfill With Cuttings
⧅	Bentonite Pellets
⁙	Sand Pack
☰	Well Sreen
☒	Split-Spoon Sample
◧	Bedrock Core Run

EMCON

BORING/WELL NO. BL-95-1

SHEET 1 of 1

PROJECT: Parking Lot #4 Remedial Investigation
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.
PROJECT NO: 04853.P2
RIG: Mobil B-61

GS ELEV: 645.41
N-S COORD: 9420.47
E-W COORD: 9697.18
WL REF ELEV: NA
DATE STARTED: 03/29/95
DATE FINISHED: 03/29/95
OPERATOR: S. Gingrich
GEOLOGIST: D. Hoyt

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"/3"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
		S-1	☒	8 2"ss	16			Medium dense, gray, white, rusty, yellow ash fill, dry.	S-1 sent for lead analysis.
		S-2	☒	12 3"ss	42		SM	Dense, gray-brown to brown-black, fine to medium sand, little silt, slag, and gravel, wet. Very dense, gray-brown to brown-black, fine to medium sand, saturated to 5.25 feet.	S-2 sent for lead and PCB analysis.
	5	S-3	☒	12 3"ss	64				
							GC	Broken gravel to 6 feet. Dense, gravel fill, saturated.	
		S-4	☒	18 2"ss	40				
								Medium dense, gravel with little medium sand, wet.	
		S-5	☒	12 2"ss	23				
	10	S-6	☒	0 2"ss	50/4"			Slough material, no recovery, saturated. Spoon and auger refusal at 10.25 feet. Drillers indicated may be on large boulder.	
								Bottom of boring at 10.25 feet.	
	15								
	20								
	25								

EMCON

BORING/WELL NO. BL-95-2

SHEET 1 of 1

PROJECT: Parking Lot #4 Remedial Investigation
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.

PROJECT NO: 04853.P2
RIG: Mobil B-61

GS ELEV: 645.63
N-S COORD: 9420.73
E-W COORD: 9651.45
WL REF ELEV: NA
DATE STARTED: 03/27/95
DATE FINISHED: 03/27/95
OPERATOR: S. Gingrich
GEOLOGIST: K. Galanti

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"/3"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
		S-1	☒	8 2"ss	4			Very loose, gray-brown, fine to medium sand, little silt, trace gravel, moist.	S-1 sent for lead analysis.
		S-2	☒	12 3"ss	14			Loose, gray-brown to brown-black, fine to medium sand, little silt, slag, and gravel, moist. Last 3 inches of spoon black-brown, fine sand, trace clay.	S-2 sent for lead and PCB analysis.
	5	S-3	☒	12 3"ss	11			Medium stiff, brown, silty clay, wet to 5.25 feet. Changes to gray, fine to medium to coarse sand, trace fine gravel and slag, wet.	
		S-4	☒	12 2"ss	109			Very dense, fine to medium to coarse sand, some fine gravel and slag, wet.	
		S-5	☒	12 2"ss	8	▨	CL	Medium stiff to stiff, red-gray clay, some silt, damp.	
	10							Bottom of boring at 10.0 feet.	
	15								
	20								
	25								

EMCON

BORING/WELL NO. BL-95-3

SHEET 1 of 1

PROJECT: Parking Lot #4 Remedial Investigation
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.

PROJECT NO: 04853.P2
RIG: Mobil B-61

GS ELEV: 641.68
N-S COORD: 9206.26
E-W COORD: 9661.29
WL REF ELEV: NA
DATE STARTED: 03/27/95
DATE FINISHED: 03/27/95
OPERATOR: S. Gingrich
GEOLOGIST: K. Galanti

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"/3"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
		S-1	☒	6 2"ss	6			Loose, brown-gray, fine to medium to coarse sand, trace fine gravel, wet.	
		S-2	☒	18 3"ss	107			Very dense, gray to dark gray to gray green, fine to medium to coarse, sand and gravel, slag, wet.	S-2 sent for lead and PCB analysis.
	5	S-3	☒	15 3"ss	20			Medium dense, gray fine to medium to coarse sand and gravel, slag to 5 feet.	S-3 sent for lead analysis.
						▨	CL	Very stiff red clay, some silt to silty clay, damp.	
								Bottom of boring at 6.0 feet.	
	10								
	15								
	20								
	25								

EMCON

BORING/WELL NO. BL-95-4

SHEET 1 of 1

PROJECT: Parking Lot #4 Remedial Investigation
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.

PROJECT NO: 04853.P2
RIG: Mobil B-61

GS ELEV: 642.65
N-S COORD: 9283.96
E-W COORD: 9657.14
WL REF ELEV: NA
DATE STARTED: 03/27/95
DATE FINISHED: 03/27/95
OPERATOR: S. Gingrich
GEOLOGIST: K. Galanti

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"/3"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
		S-1	☒	10 2"ss	5			Loose, brown, gray, and black, fine to medium to coarse sand, little fine gravel, trace wood, moist.	
		S-2	☒	18 3"ss	48			Dense, red brick to 2.5 feet. Dark gray fine to medium to coarse sand, and gravel to 4.0 feet (slag material), wet.	S-2 sent for lead and PCB analysis.
	5	S-3	☒	15 3"ss	41			Dense, gray fine to medium to coarse sand (slag) to 5.7 feet, wet.	S-3 sent for lead analysis.
		S-4	☒	15 2"ss	17	▨	CL	Changes to hard red clay with some silt to 6.0 feet, damp. Very stiff red clay, some silt to silty clay, damp.	
								Bottom of boring at 8.0 feet.	
	10								
	15								
	20								
	25								

BORING/WELL NO. BL-95-5

SHEET 1 of 1

PROJECT: Parking Lot #4 Remedial Investigation	**PROJECT NO:** 04853.P2	**GS ELEV:** 646.13
CLIENT: General Motors Corporation		**N-S COORD:** 9421.77
CONTRACTOR: Earth Dimensions, Inc.	**RIG:** Mobil B-61	**E-W COORD:** 10030.67
		WL REF ELEV: NA
		DATE STARTED: 03/27/95
		DATE FINISHED: 03/27/95
		OPERATOR: D. Gramsa
		GEOLOGIST: D. Hoyt

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
		S-1	☒	14 2"ss	28			Medium dense, black-gray asphalt and subgrade to 2.0 feet, dry.	
		S-2	☒	12 2"ss	4			Very loose, gray, white, rusty, yellow ash and cinder fill, dry to 4 feet.	S-2 sent for lead analysis.
	5	S-3	☒	9 2"ss	2			Very loose, gray, white, rusty, yellow ash and cinder fill, wet to 6.2 feet.	S-3 sent for lead analysis.
		S-4	☒	12 2"ss	2		CH	Very soft black, native topsoil and silt, saturated to 7.75 feet.	
							CL	Very soft gray clay, wet.	
								Bottom of boring at 8.0 feet.	
	10								
	15								
	20								
	25								

EMCON

BORING/WELL NO. BL-95-6

SHEET 1 of 1

PROJECT: Parking Lot #4 Remedial Investigation
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.

PROJECT NO: 04853.P2

RIG: Mobil B-61

GS ELEV: 640.40
N-S COORD: 8758.14
E-W COORD: 10058.61
WL REF ELEV: NA
DATE STARTED: 03/27/95
DATE FINISHED: 03/27/95
OPERATOR: D. Gramsa
GEOLOGIST: D. Hoyt

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
		S-1	☒	12 2"ss	9	■ ⁙		Medium dense, black-gray asphalt and subgrade to 0.5 feet. White, tan, and rust ash fill, wet, to 2 feet.	
		S-2	☒	18 2"ss	4	⁙		Very loose, gray, white, tan, and rust ash fill to 4 feet.	S-2 sent for lead analysis.
	5	S-3	☒	12 2"ss	3	⁙		Very loose, gray, white, tan, and rust ash fill and wood, wet, to 6 feet.	S-3 sent for lead analysis.
		S-4	☒	18 2"ss	11	▨	CL	Stiff gray clay, wet.	
								Bottom of boring at 8.0 feet.	
	10								
	15								
	20								
	25								

EMCON

BORING/WELL NO. BL-95-7

SHEET 1 of 1

PROJECT: Parking Lot #4 Remedial Investigation
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.

PROJECT NO: 04853.P2

RIG: Mobil B-61

GS ELEV: 637.69
N-S COORD: 8542.40
E-W COORD: 9990.79
WL REF ELEV: NA
DATE STARTED: 03/27/95
DATE FINISHED: 03/27/95
OPERATOR: D. Gramsa
GEOLOGIST: D. Hoyt

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
								Medium dense, asphalt subgrade and red clay to 0.5 feet.	
		S-1	☒	12 2"ss	17			Loose sand to 2 feet.	
		S-2	☒	12 2"ss	10			Loose sand with 1-inch clay lense at 3 feet, wet.	S-2 sent for lead analysis.
	5	S-3	☒	18 2"ss	28	▨	CL	Very stiff, red clay. Changes to gray clay at 5.8 feet.	S-3 sent for lead analysis.
								Bottom of boring at 6.0 feet.	
	10								
	15								
	20								
	25								

EMCON

BORING/WELL NO. BL-95-8

SHEET 1 of 1

PROJECT: *Parking Lot #4 Remedial Investigation*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Earth Dimensions, Inc.*

PROJECT NO: *04853.P2*
RIG: *Mobil B-61*

GS ELEV: *639.50*
N-S COORD: *8753.29*
E-W COORD: *9900.91*
WL REF ELEV: *NA*
DATE STARTED: *03/27/95*
DATE FINISHED: *03/27/95*
OPERATOR: *D. Gramsa*
GEOLOGIST: *D. Hoyt*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
		S-1	☒	12 2"ss	32			Dense, asphalt and subgrade material to 1.8 feet.	
		S-2	☒	12 2"ss	6			Ash at tip of spoon to 2 feet. Loose, white, tan, black ash material, damp.	S-2 sent for lead analysis.
	5	S-3	☒	12 2"ss	2		CH	Soft, black organic silt, wet.	S-3 sent for lead analysis.
		S-4	☒	16 2"ss	8			Medium stiff, tan sandy silt with 2" sand lens, damp.	
		S-5	☒	10 2"ss	25		CL	Very stiff, red clay.	
	10							Bottom of boring at 10.0 feet.	
	15								
	20								
	25								

EMCON

BORING/WELL NO. BL-95-9

SHEET 1 of 1

PROJECT: *Parking Lot #4 Remedial Investigation*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Earth Dimensions, Inc.*

PROJECT NO: *04853.P2*
RIG: *Mobil B-61*

GS ELEV: *640.33*
N-S COORD: *8851.72*
E-W COORD: *9735.41*
WL REF ELEV: *NA*
DATE STARTED: *03/28/95*
DATE FINISHED: *03/28/95*
OPERATOR: *S. Gingrich*
GEOLOGIST: *K. Galanti*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
						■		Auger through asphalt and bedding material to 1.0 foot.	
		S-1	☒	12 2"ss	7	⁘		Loose, black, gray, and red, fine to medium sand and ash to 3 feet.	
		S-2	☒	15 2"ss	4	⁘		Very loose, gray to light gray to black, fine to medium sand and ash to 5 feet.	S-2 sent for lead analysis.
	5	S-3	☒	10 2"ss	2		CH	Very soft, brown to black, fine sand and organic silt layer to 7 feet.	S-3 sent for lead analysis.
		S-4	☒	6 2"ss	4			Soft, black to gray organic silt, little gravel, saturated to 9 feet.	
	10	S-5	☒	12 3"ss	4	▨	CL	Soft, gray to green clay, some silt, saturated.	
								Bottom of boring at 11.0 feet.	
	15								
	20								
	25								

EMCON

BORING/WELL NO. BL-95-10

SHEET 1 of 1

PROJECT: *Parking Lot #4 Remedial Investigation*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Earth Dimensions, Inc.*

PROJECT NO: *04853.P2*
RIG: *Mobil B-61*

GS ELEV: *643.63*
N-S COORD: *9277.18*
E-W COORD: *9764.56*
WL REF ELEV: *NA*
DATE STARTED: *03/30/95*
DATE FINISHED: *03/30/95*
OPERATOR: *S. Gingrich*
GEOLOGIST: *K. Galanti*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
								Auger through asphalt and bedding material to 1.0 foot.	
		S-1		15 2"ss	20			Medium dense, brown, fine to medium sand, sewer bedding.	
		S-2		18 3"ss	4			Very loose, brown to gray-brown, fine to medium sand, sewer bedding, moist to 5 feet.	S-2 sent for PCB and lead analysis.
	5						CH	Loose, brown to black, fine to medium sand and organic silt, moist to 6 feet.	S-3 sent for PCB and lead analysis.
		S-3		18 3"ss	17		CL	Very stiff, red-gray clay, some silt, moist.	
								Bottom of boring at 7.0 feet.	
	10								
	15								
	20								
	25								

EMCON

BORING/WELL NO. BL-95-11

SHEET 1 of 1

PROJECT: *Parking Lot #4 Remedial Investigation*
PROJECT NO: *04853.P2*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Earth Dimensions, Inc.*
RIG: *Mobil B-61*

GS ELEV: *644.25*
N-S COORD: *9281.24*
E-W COORD: *9923.97*
WL REF ELEV: *NA*
DATE STARTED: *03/29/95*
DATE FINISHED: *03/29/95*
OPERATOR: *S. Gingrich*
GEOLOGIST: *D. Hoyt*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
						Auger through asphalt and bedding material to 1.0 foot.	S-1 sent for lead analysis.
	S-1	☒	10 2"ss	4		Very loose, brown, fine to medium sand and ash, saturated, to 3 feet.	
	S-2	☒	8 3"ss	15	CH	Stiff, black organic silt, saturated. Stiff, black organic silt to 5.5 feet.	S-2 sent for lead analysis.
5	S-3	☒	16 3"ss	15	CL	Hard, red clay.	
						Bottom of boring at 7.0 feet.	
10							
15							
20							
25							

EMCON

BORING/WELL NO. BL-95-12

SHEET 1 of 1

PROJECT: Parking Lot #4 Remedial Investigation
PROJECT NO: 04853.P2
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.
RIG: Mobil B-61

GS ELEV: 642.50
N-S COORD: 9049.92
E-W COORD: 9879.75
WL REF ELEV: NA
DATE STARTED: 03/29/95
DATE FINISHED: 03/29/95
OPERATOR: S. Gingrich
GEOLOGIST: D. Hoyt

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
								Auger through asphalt and bedding material to 1.0 foot.	
								Loose, brown ash to 1.2 feet.	
		S-1	☒	18 2"ss	9			Loose, brown to tan, fine to medium sand, damp.	S-1 sent for lead analysis.
		S-2	☒	12 3"ss	4			Very loose, tan, fine to medium sand, wet.	S-2 sent for lead analysis.
	5								
		S-3	☒	24 3"ss	3			Very loose, tan, fine to medium sand, wet, to 6.8 feet.	S-3 sent for PCB analysis.
							CL	Very soft, red clay.	
								Bottom of boring at 7.0 feet.	
	10								
	15								
	20								
	25								

EMCON

BORING/WELL NO. BL-95-13

SHEET 1 of 1

PROJECT: Parking Lot #4 Remedial Investigation
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.
PROJECT NO: 04853.P2
RIG: Mobil B-61

GS ELEV: 640.27
N-S COORD: 8862.32
E-W COORD: 9966.00
WL REF ELEV: NA
DATE STARTED: 03/29/95
DATE FINISHED: 03/29/95
OPERATOR: S. Gingrich
GEOLOGIST: D. Hoyt

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
								Asphalt and subgrade to 0.35 feet.	
								Loose, brown, black, orange, tan, white, ash, damp.	
		S-1	☒	10 2"ss	12			Loose, brown, black, orange, tan, white, ash, damp.	S-2 sent for lead analysis.
		S-2	☒	16 2"ss	7			Very loose, brown, black, orange, tan, white, ash, wet.	
	5	S-3	☒	4 2"ss	3			Very loose, brown, black, orange, tan, white, ash to 7.8 feet.	S-4 sent for lead analysis.
		S-4	☒	10 2"ss	1/12		CH	Topsoil, wet, to 8.0 feet.	
							CL	Medium stiff gray clay, wet.	
	10	S-5		14 2"ss	7			Bottom of boring at 10.0 feet.	
	15								
	20								
	25								

EMCON

BORING/WELL NO. BL-95-14

SHEET 1 of 1

PROJECT: *Parking Lot #4 Remedial Investigation*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Earth Dimensions, Inc.*
PROJECT NO: *04853.P2*
RIG: *Mobil B-61*

GS ELEV: *640.89*
N-S COORD: *8942.26*
E-W COORD: *9798.00*
WL REF ELEV: *NA*
DATE STARTED: *03/28/95*
DATE FINISHED: *03/28/95*
OPERATOR: *S. Gingrich*
GEOLOGIST: *K. Galanti*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
◇						■		Auger through asphalt and bedding material to 1.0 foot.	
◇		S-1	☒	16 2"ss	6	⁘		Loose, brown, black, gray, tan, white, fine to medium sand, ash, and cinders.	S-1 sent for lead analysis.
◇		S-2	☒	12 2"ss	7	▨	CL	Medium stiff, gray to red-gray, silty clay, moist.	S-2 sent for lead analysis.
◇	5	S-3	☒	18 2"ss	17	▨		Very stiff, red-gray silty clay.	
								Bottom of boring at 7.0 feet.	
	10								
	15								
	20								
	25								

EMCON

BORING/WELL NO. BL-95-15

SHEET 1 of 1

PROJECT: Parking Lot #4 Remedial Investigation
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.

PROJECT NO: 04853.P2
RIG: Mobil B-61

GS ELEV: 643.06
N-S COORD: 9138.05
E-W COORD: 9821.10
WL REF ELEV: NA
DATE STARTED: 03/29/95
DATE FINISHED: 03/29/95
OPERATOR: S. Gingrich
GEOLOGIST: D. Hoyt

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
								Auger through asphalt and bedding material to 1.0 foot.	
		S-1		12 2"ss	8			Loose, brown, black, orange, tan, white, ash, damp, to 2.75 feet.	S-1 sent for lead analysis.
		S-2		12 3"ss	10		CL	Soft, red-gray clay. Stiff, red-gray clay.	S-2 sent for lead analysis.
	5	S-3		2"ss	26			Very stiff, red clay.	
								Bottom of boring at 7.0 feet.	
	10								
	15								
	20								
	25								

EMCON

BORING/WELL NO. BL-95-16

SHEET 1 of 1

PROJECT: Parking Lot #4 Remedial Investigation
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.

PROJECT NO: 04853.P2
RIG: Mobil B-61

GS ELEV: 638.38
N-S COORD: 8643.13
E-W COORD: 9990.55
WL REF ELEV: NA
DATE STARTED: 03/27/95
DATE FINISHED: 03/27/95
OPERATOR: D. Gramsa
GEOLOGIST: D. Hoyt

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
							CH	Asphalt and subgrade to 3 inches.	
		S-1	☒	13 2"ss	10			Stiff, black organic silt layer to 1.8 feet.	
								Black-gray ash fill to 2.0 feet, dry.	
		S-2	☒	16 2"ss	42		CH	Black-gray ash fill to 2.25 feet, damp.	S-2 sent for lead analysis.
								Hard, light tan sandy silt to 4.0 feet.	
								Stiff, brown sandy silt to 5.1 feet, dry.	S-3 sent for lead analysis.
	5	S-3	☒	14 2"ss	15	▨	CL	Red clay last 11 inches of spoon, dry.	
								Bottom of boring at 6.0 feet.	
	10								
	15								
	20								
	25								

EMCON

BORING/WELL NO. MW-200

SHEET 1 of 1

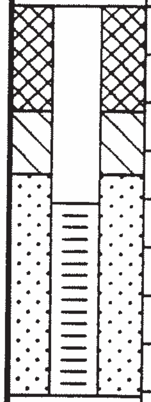
PROJECT: Parking Lot #4 Remedial Investigation
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.
PROJECT NO: 04853.P2
RIG: Mobil B-61

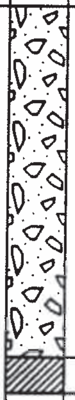
GS ELEV: 644.16
N-S COORD: 9349.52
E-W COORD: 9655.48
WL REF ELEV: 643.91
DATE STARTED: 03/27/95
DATE FINISHED: 03/27/95
OPERATOR: S. Gingrich
GEOLOGIST: K. Galanti

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
4/6/95	3.18	640.73	NA
4/17/95	3.07	640.84	NA
4/24/95	3.14	640.77	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	4.25"	2"/3"		
WEIGHT		140#		
FALL		30"		





DEPTH (feet)	SAMPLE NUMBER	RECOVERY (inches)	N-VALUE	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
					Loose, brown-gray, fine to medium sand, some silt, gravel, and wood.	
	S-1	12 2"ss	6			
	S-2	8 3"ss	12		Medium dense, brown to black, fine to medium to coarse sand, some fine gravel, wood, and slag, wet.	S-2 sent for lead and PCB analysis.
5	S-3	18 3"ss	84		Very dense, dark gray to gray to black, fine to medium to coarse sand, fine gravel, and slag, wet.	S-3 sent for lead analysis.
	S-4	12 2"ss	3		Very loose, gray to black slag to 7.25 feet.	
				CL	Very soft, red clay, some silt.	
					Bottom of boring at 8.0 feet.	
10						
15						
20						
25						

EMCON

BORING/WELL NO. MW-201

SHEET 1 of 1

PROJECT: *Parking Lot #4 Remedial Investigation*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Earth Dimensions, Inc.*

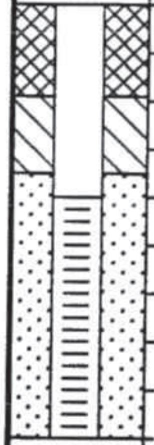
PROJECT NO: *04853.P2*
RIG: *Mobil B-61*

GS ELEV: *647.65*
N-S COORD: *9708.53*
E-W COORD: *9652.36*
WL REF ELEV: *647.30*
DATE STARTED: *03/28/95*
DATE FINISHED: *03/28/95*
OPERATOR: *S. Gingrich*
GEOLOGIST: *K. Galanti*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
4/6/95	6.27	641.03	NA
4/17/95	6.22	641.08	NA
4/24/95	6.28	641.02	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	4.25"	2"/3"		
WEIGHT		140#		
FALL		30"		



DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
						Auger through asphalt and bedding to 1.0 foot.	
	S-1	☒	10 2"ss	62		Very dense, gray-green to brown, fine to medium sand and slag.	Piece of slag in end of spoon.
	S-2	☒	20 3"ss	22		Medium dense, gray-green, brown, tan, fine to medium sand, slag, and wood.	S-2 sent for lead analysis.
5	S-3	☒	10 3"ss	7		Loose, brown, orange, tan, fine to medium to coarse sand, slag, and wood, wet.	S-3 sent for lead analysis.
	S-4	☒	18 2"ss	4		Very loose, brown to orange, medium to coarse sand to 7.75 feet.	
					CH	Black organic silt to 8.0 feet.	
					CL	Stiff, gray silt, little clay changing to red-gray silty clay.	
10						Bottom of boring at 9.0 feet.	
15							
20							
25							

EMCON

BORING/WELL NO. MW-202

SHEET 1 of 1

PROJECT: Parking Lot #4 Remedial Investigation
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.

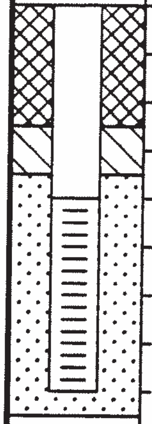
PROJECT NO: 04853.P2
RIG: Mobil B-61

GS ELEV: 640.39
N-S COORD: 8763.06
E-W COORD: 10058.59
WL REF ELEV: 639.91
DATE STARTED: 03/30/95
DATE FINISHED: 03/30/95
OPERATOR: S. Gingrich
GEOLOGIST: K. Galanti

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
4/6/95	4.16	635.75	NA
4/17/95	4.10	635.81	NA
4/24/95	4.19	635.72	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA			
DIAM.	4.25"			
WEIGHT				
FALL				



DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
							Auger through asphalt, bedding, and fill to 4.0 feet.	MW-202 located adjacent to BL-95-6. Borehole only sampled from 4 to 8 feet to confirm the top of clay. No samples were sent for lab analysis.
5	S-1	☒	15 2"ss	3			Very loose, brown, tan, white, fine to medium to coarse sand and ash, saturated to 6.0 feet.	
	S-2	☒	8 2"ss	5		CH	Medium stiff, black organic silt to gray silt, some clay to 7.5 feet.	
					▨	CL	Gray clay. Auger to 8.5 feet.	
							Bottom of boring at 8.5 feet.	
10								
15								
20								
25								

EMCON

BORING/WELL NO. MW-203

SHEET 1 of 1

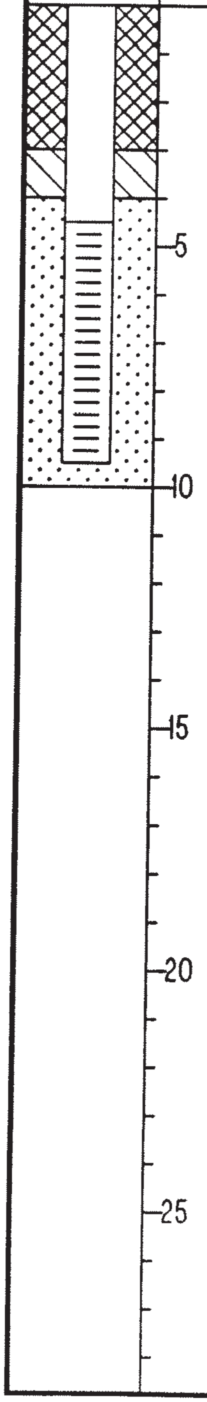
PROJECT: *Parking Lot #4 Remedial Investigation*
PROJECT NO: *04853.P2*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Earth Dimensions, Inc.*
RIG: *Mobil B-61*

GS ELEV: *640.26*
N-S COORD: *8854.68*
E-W COORD: *9730.22*
WL REF ELEV: *640.11*
DATE STARTED: *03/30/95*
DATE FINISHED: *03/30/95*
OPERATOR: *S. Gingrich*
GEOLOGIST: *K. Galanti*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
4/6/95	3.06	637.05	NA
4/17/95	3.14	636.97	NA
4/24/95	3.21	636.90	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA			
DIAM.	4.25"			
WEIGHT				
FALL				



WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
								Auger through asphalt, bedding, and fill to 10.0 feet. See log of BL-95-9 for lithology.	MW-203 located adjacent to BL-95-9. Borehole not sampled, therefore no samples were sent for lab analysis.
	10							Bottom of boring at 10.0 feet.	

EMCON

BORING/WELL NO. MW-204

SHEET 1 of 1

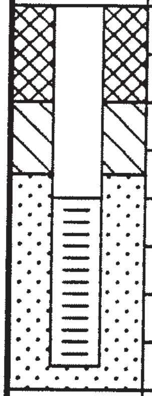
PROJECT: Parking Lot #4 Remedial Investigation
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.
PROJECT NO: 04853.P2
RIG: Mobil B-61

GS ELEV: 644.87
N-S COORD: 9389.01
E-W COORD: 9829.47
WL REF ELEV: 644.59
DATE STARTED: 03/29/95
DATE FINISHED: 03/29/95
OPERATOR: S. Gingrich
GEOLOGIST: D. Hoyt

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
4/6/95	2.55	642.04	NA
4/17/95	2.57	642.02	NA
4/24/95	2.66	641.93	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	4.25"	2"/3"		
WEIGHT		140#		
FALL		30"		



DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
						Medium dense, intermixed black, white, gray ash, tan sand and silt, dry.	
	S-1		12 2"ss	25		Medium dense, intermixed black, white, gray ash, tan silt, tan sand, red clay to 3 feet. Changes to black, gray, white ash, damp, to 4.0 feet.	S-2 sent for lead and PCB analysis.
5	S-2		16 3"ss	21		Loose, black, white, gray ash fill, wet to saturated, to 6.0 feet.	S-3 sent for lead analysis.
	S-3		10 3"ss	7	CH	Stiff black silt to 6.6 feet, saturated.	
					CL	Stiff, red clay.	
	S-4		15 3"ss	11		Bottom of boring at 8.0 feet.	
10							
15							
20							
25							

EMCON

BORING/WELL NO. RW-95-1

SHEET 1 of 1

PROJECT: Parking Lot #4 Remedial Investigation
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.

PROJECT NO: 04853.P2
RIG: Mobil B-61

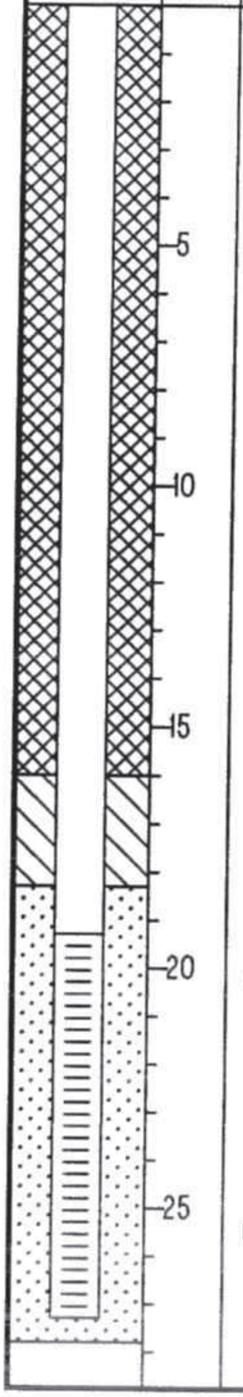
GS ELEV: 644.55
N-S COORD: 9230.66
E-W COORD: 9679.15
WL REF ELEV: 646.22
DATE STARTED: 03/29-30/95
DATE FINISHED: 03/29-30/95
OPERATOR: S. Gingrich
GEOLOGIST: K. Galanti/D. Hoyt

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
4/6/95	21.49	624.73	NA
4/17/95	21.42	624.80	NA
4/24/95	21.45	624.77	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		HW
DIAM.	6.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT / DEPTH (feet)



SAMPLE NUMBER	RECOVERY (inches)	N-VALUE	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS
				Auger through asphalt and bedding to 1.0 foot.	
S-1	20 2"ss	66		Very dense, brown, tan, gray fine to medium sand and slag.	
S-2	12 2"ss	11		Medium dense, gray, brown, fine to medium to coarse sand and slag, saturated, to 5.0 feet.	S-2 sent for lead analysis.
S-3	15 2"ss	3		Very loose, gray to gray-white fine ash to 6.0 feet.	S-3 sent for lead and PCB analysis.
			CH	Black organic silt to 6.25 feet.	
			CL	Medium stiff, red-gray clay, some silt.	
				Auger to 17.4 feet.	
				Auger refusal at 17.4 feet. Top of bedrock at 17.4 feet.	
R-1	26.4	86.4%		Gray limestone bedrock.	
R-2	60	100%			
R-3	33.6	100%			
				Bottom of boring at 27.8 feet.	

EMCON

LEGEND FOR BORING LOGS

PROJECT: Proposed AAM Parts Coating Building Location

PROJECT NO.: 04428.LS

BORING NO.: BH-6 through BH-27

GRAPHIC SYMBOL	SOIL/ROCK CODE	DESCRIPTION OF SYMBOLS USED IN LITHOLOGIC LOG COLUMN	SYMBOL or PATTERN	DESCRIPTION OF SYMBOLS USED IN WELL CONSTRUCTION AND SAMPLE SYMBOLS
■	Asphalt	ASPHALT PAVEMENT	⧅	Cement Grout
◇	Fill	FILL MATERIAL	☒	Split-Spoon Sample
⁘	Ash	ASH FILL	◧	Bedrock Core Run
▨	CL	INORGANIC CLAY		HSP - Headspace readings
┄	CH	SILT		XRF - X-Ray Fluoresence readings, ppm
▧	SM	SILTY SAND		NR - No Response
▦	Ls	LIMESTONE		

EMCON

BORING/WELL NO. BH-6

SHEET 1 of 1

PROJECT: *Proposed AAM Paint Coating Bldg. Location*
CLIENT: *General Motors Corporation*
CONTRACTOR: *SJB Drilling Services, Inc.*
PROJECT NO: *04428.LS*
RIG: *CME-550*

GS ELEV: *646.9*
N-S COORD: *10027.18*
E-W COORD: *9926.96*
WL REF ELEV: *NA*
DATE STARTED: *9/16/94*
DATE FINISHED: *9/16/94*
OPERATOR: *K. Swinnich*
GEOLOGIST: *KB Galanti*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		NQ
DIAM.	4.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP
								Bored through first 0.5' of asphalt pavement.	
		S-1		3	6			Loose, brown to dark brown, medium to coarse Sand and fine Gravel, ash, dry.	0.2ppm
		S-2		3	4			Same as above.	0.1ppm
	5	S-3		6	2			Very loose, brown fine Sand and Silt, ash, trace fine Gravel to 5.5 feet.	NR
							CL	Black fine Silt, organic material, topsoil to 5.75 feet.	
		S-4		21	10			Light brown to red Clay, little fine Silt to 6 feet. Stiff, red Silty Clay with gray mottling, wet.	NR
	10								
	15	S-5		24	24			Very stiff, red Silty Clay to 16.5'. Changes to red Silt and fine Sand, trace Clay and fine Gravel.	NR
							SM	Top of Bedrock	Auger refusal at 17.2'.
							Ls	Light to medium gray Limestone. Fractures at 18', 19', 19.5', 19.6'.	
	20	R-1		56	95.5%				
								Bottom of boring at 22.2'.	
	25								

EMCON

BORING/WELL NO. BH-7

SHEET 1 of 1

PROJECT: *Proposed AAM Paint Coating Bldg. Location*
CLIENT: *General Motors Corporation*
CONTRACTOR: *SJB Drilling Services, Inc.*

PROJECT NO: *04428.LS*
RIG: *CME-550*

GS ELEV: *646.10*
N-S COORD: *9736.08*
E-W COORD: *9940.12*
WL REF ELEV: *NA*
DATE STARTED: *9/16/94*
DATE FINISHED: *9/16/94*
OPERATOR: *K. Swinnich*
GEOLOGIST: *KB Galanti*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		NQ
DIAM.	4.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP
								Bored through first 0.5' of asphalt pavement.	
		S-1		6	8			Loose, brown to gray fine to medium to coarse Sand and fine Gravel, dry.	NR
		S-2		9	4			Very loose, brown to orange fine Sand, Ash, Cinders, Slag, Glass, fine to coarse Gravel, moist. Fill. Same to 5.0 feet.	NR
	5	S-3		2	12		CH	Very soft, dark gray to black fine Silt, some Clay, organic material, topsoil, wet, to 6.0 feet.	NR
		S-4		15	9		CL	Stiff, gray Clay, little Silt to 7.25'. Changes to red Clay, wet.	NR
	10								
	15	S-5		22	33		SM	Hard, red Clay and Silt, trace fine Gravel. 0.1' thick layer of shale at 16.25'. Top of Bedrock	NR Auger refusal at 18.7'.
	20	R-1		52	84.9%		Ls	Light to medium gray Limestone. Fractures at 19.2', 19.3', 20.8', 20.9, 21.5'.	
								Bottom of boring at 23.7'.	
	25								

EMCON

BORING/WELL NO. BH-8

SHEET 1 of 1

PROJECT: Proposed AAM Paint Coating Bldg. Location
CLIENT: General Motors Corporation
CONTRACTOR: SJB Drilling Services, Inc.

PROJECT NO: 04428.LS
RIG: CME-550

GS ELEV: 646.38
N-S COORD: 10023.83
E-W COORD: 9765.55
WL REF ELEV: NA
DATE STARTED: 9/16/94
DATE FINISHED: 9/16/94
OPERATOR: K. Swinnich
GEOLOGIST: DJ Hoyt

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.5"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP
▨		S-1	☒	12	7			Bored through first 0.5' of asphalt pavement. Loose dark brown to black fine Sand and Gravel, pavement base to 1.0 foot.	0.1ppm
▨								Dark brown Gravel, fine Sand, Slag, oxidized material to 2.0'.	
▨		S-2	☒	12	4			Very loose, tan, brown to black fine Sand and Gravel, Ash, little Clay to 3.75'.	0.1ppm
▨						▨	CL	Red Clay.	
▨	5	S-3	☒	9	42	▨		Soft, red Clay, some fine Gravel, some black mottling.	NR
▨		S-4	☒	5	9	▨		Stiff, red Clay.	NR
								Bottom of boring at 8.0'.	
	10								
	15								
	20								
	25								

EMCON

BORING/WELL NO. BH-9

SHEET 1 of 1

PROJECT: Proposed AAM Paint Coating Bldg. Location
CLIENT: General Motors Corporation
CONTRACTOR: SJB Drilling Services, Inc.
PROJECT NO: 04428.LS
RIG: CME-550

GS ELEV: 645.50
N-S COORD: 9740.31
E-W COORD: 9751.78
WL REF ELEV: NA
DATE STARTED: 9/16/94
DATE FINISHED: 9/16/94
OPERATOR: K. Swinnich
GEOLOGIST: DJ Hoyt

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.5"	2"		
WEIGHT		140#		
FALL		30"		

DEPTH (feet)	SAMPLE NUMBER	RECOVERY (inches)	N-VALUE	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP
	S-1	8	6		Bored through first 0.5' of asphalt pavement. Loose, gray fine Sand and Gravel, pavement base to 1.0'. Orange, red, white, and black Ash, Sand, Gravel, Slag, to 2.0'.	0.1ppm
	S-2	8	2		Very loose, black, orange, red, and white Ash, Sand, Gravel, and Slag, fine and gritty, wet.	NR
5	S-3	12	4		Very loose, dark brown fine Sand and Silt, Ash, some Gravel to 5.75'.	NR
	S-4	12	24	CL	Red Clay to 6'. Very stiff, red Clay.	NR
					Bottom of boring at 8.0'.	
10						
15						
20						
25						

EMCON

BORING/WELL NO. BH-10

SHEET 1 of 1

PROJECT: Proposed AAM Paint Coating Bldg. Location
PROJECT NO: 04428.LS
CLIENT: General Motors Corporation
CONTRACTOR: SJB Drilling Services, Inc.
RIG: CME-550

GS ELEV: 646.28
N-S COORD: 9879.06
E-W COORD: 9826.48
WL REF ELEV: NA
DATE STARTED: 9/16/94
DATE FINISHED: 9/16/94
OPERATOR: K. Swinnich
GEOLOGIST: DJ Hoyt

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.5"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP
▨		S-1	☒	8	6			Bored through first 0.5' of asphalt pavement. Loose, gray to dark gray fine Sand and Gravel, pavement base to 1.0'. Orange-white Ash, Sand, Gravel, Slag, Fill material to 2.0'.	0.1ppm
▨		S-2	☒	12	4			Very loose, brown, orange, and white Ash, Sand, Slag, Cinders to 3.5'.	0.1ppm
▨	5	S-3	☒	12	5		CH	Dark brown Silt, some Clay and fine Sand, topsoil to 4.0'. Medium stiff, dark brown Silt, some Clay, trace fine Gravel, topsoil to 5.5'.	NR
▨		S-4	☒	10	16	▨	CL	Red Clay to 6'. Very stiff, red Clay.	NR
								Bottom of boring at 8.0'.	
	10								
	15								
	20								
	25								

EMCON

BORING/WELL NO. BH-11

SHEET 1 of 1

PROJECT: *Proposed AAM Paint Coating Bldg. Location*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Earth Dimensions, Inc.*

PROJECT NO: *04428.LS*
RIG: *Mobil B-61*

GS ELEV: *646.84*
N-S COORD: *10055.20*
E-W COORD: *9689.75*
WL REF ELEV: *NA*
DATE STARTED: *10/24/94*
DATE FINISHED: *10/24/94*
OPERATOR: *R. Windsor*
GEOLOGIST: *KB Galanti*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP	REMARKS XRF
▨		S-1	☒	8	16	■		Pavement base, medium dense, brown fine to coarse gravel and sand, 1" layer of red clay at bottom.	0.2	NR
▨		S-2	☒	8	12			Medium dense, dark brown silty Clay to 3.5', moist.	NR	NR
▨	5	S-3	☒	12	3			White, brown, black ashy fill, coarse sand and Gravel, slag to 4'. Very loose, white, red, brown medium to coarse Sand, ash fill, slag to 5.75', wet.	NR	245
▨		S-4	☒	12	7	▨	CL	Red Clay, little silt, moist. Medium stiff, gray-red Clay, little silt, moist.	NR	NR
								Bottom of boring at 8.0'.		
	10									
	15									
	20									
	25									

EMCON

BORING/WELL NO. BH-12

SHEET 1 of 1

PROJECT: Proposed AAM Paint Coating Bldg. Location
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.
PROJECT NO: 04428.LS
RIG: Mobil B-61

GS ELEV: 646.87
N-S COORD: 10070.45
E-W COORD: 9859.74
WL REF ELEV: NA
DATE STARTED: 10/24/94
DATE FINISHED: 10/24/94
OPERATOR: R. Windsor
GEOLOGIST: KB Galanti

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP	REMARKS XRF
								Pavement base to 1.0'.		
		S-1		6	30			Medium dense, gray, red, tan, black fine to coarse Sand, Ash, fine Gravel with trace slag, dry.	NR	534
		S-2		12	4			Very loose orange, tan, fine to coarse Sand, Ash, trace slag to 3.75', dry.	NR	2272
							CH	Brown Silt with little Clay, topsoil, moist to 4.0'.		
	5	S-3		18	9		CL	Stiff red Clay with little silt, moist. 1" thick stiff gray Clay with roots at 5.5'.	NR	NR
		S-4		15	14			Stiff, red clay with little silt, moist	NR	NR
								Bottom of boring at 8.0'.		
	10									
	15									
	20									
	25									

EMCON

BORING/WELL NO. BH-13

SHEET 1 of 1

PROJECT: Proposed AAM Paint Coating Bldg. Location
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.
PROJECT NO: 04428.LS
RIG: Mobil B-61

GS ELEV: 648.25
N-S COORD: 9957.63
E-W COORD: 9663.61
WL REF ELEV: NA
DATE STARTED: 10/24/94
DATE FINISHED: 10/24/94
OPERATOR: R. Windsor
GEOLOGIST: KB Galanti

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP	REMARKS XRF
								Pavement base to 1.0'.		
		S-1		6	35			Dense brown fine to coarse Sand, some fine Gravel, dry.	NR	NR
		S-2		6	37			Medium dense, brown, tan, green fine to medium Sand, little fine Gravel with trace Silt, wet.	NR	NR
	5	S-3		18	8			Loose, brown, black, tan, orange fine to coarse Sand and Gravel, Ash, trace slag, moist. Dark gray Clay, little silt at end of spoon.	NR	5
		S-4		3	4			Medium stiff, tan, brown, black fine Sand and organic Silt, Ash, slag, wet, to 8.0'.	NR	2559
							CH	Soft, black organic silt, saturated to 9.0'.		
		S-5		12	7		CL	Medium stiff gray-red Clay and little silt, wet.	NR	264
	10							Bottom of boring at 10.0'.		
	15									
	20									
	25									

EMCON

BORING/WELL NO. BH-14

SHEET 1 of 1

PROJECT: *Proposed AAM Paint Coating Bldg. Location*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Earth Dimensions, Inc.*

PROJECT NO: *04428.LS*
RIG: *Mobil B-61*

GS ELEV: *646.30*
N-S COORD: *9959.07*
E-W COORD: *9762.14*
WL REF ELEV: *NA*
DATE STARTED: *10/24/94*
DATE FINISHED: *10/24/94*
OPERATOR: *R. Windsor*
GEOLOGIST: *KB Galanti*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP	REMARKS XRF
▨						■		Pavement base to 1.0'.		
▨		S-1	☒	6	20	●		Medium dense, gray, brown, orange, black fine to coarse Sand and Gravel Ash, slag, dry.	NR	174
▨		S-2	☒	12	4	●		Very loose black, brown, orange, tan fine to coarse Sand and fine Gravel, Ash, little slag, dry.	NR	1633
▨	5	S-3	☒	18	7	▨	CL	Medium stiff, gray silty Clay with little fine Sand to 4.0'. Same to 5.0'. Changes to medium stiff red Clay, little Silt, moist to 6.0'.	NR	NR
								Bottom of boring at 6.0'.		
	10									
	15									
	20									
	25									

EMCON

BORING/WELL NO. BH-15

SHEET 1 of 1

PROJECT: Proposed AAM Paint Coating Bldg. Location	**PROJECT NO:** 04428.LS	**GS ELEV:** 646.34
CLIENT: General Motors Corporation		**N-S COORD:** 9962.64
CONTRACTOR: Earth Dimensions, Inc.	**RIG:** Mobil B-61	**E-W COORD:** 9859.02
		WL REF ELEV: NA
		DATE STARTED: 10/24/94
		DATE FINISHED: 10/24/94
		OPERATOR: R. Windsor
		GEOLOGIST: KB Galanti

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP	REMARKS XRF
▨						■		Pavement base to 1.0'.		
▨		S-1	☒	12	12	⁘		Medium dense, red, orange, tan, black fine to coarse Sand and Gravel, Ash, dry.	NR	NR
▨		S-2	☒	16	3	⁘		Very loose brown, orange, tan fine to coarse Sand and Gravel with Ash, slag, and glass, wet to 3.8'	NR	197
▨						▨	CL	Soft, gray to red Clay, little silt to 4.0'.		
▨	5	S-3	☒	12	5	▨		Medium stiff, gray to red Clay with trace silt, moist.	NR	NR
								Bottom of boring at 6.0'.		
	10									
	15									
	20									
	25									

EMCON

BORING/WELL NO. BH-16

SHEET 1 of 1

PROJECT: Proposed AAM Paint Coating Bldg. Location
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.

PROJECT NO: 04428.LS
RIG: Mobil B-61

GS ELEV: 647.27
N-S COORD: 9966.87
E-W COORD: 9959.41
WL REF ELEV: NA
DATE STARTED: 10/24/94
DATE FINISHED: 10/24/94
OPERATOR: R. Windsor
GEOLOGIST: KB Galanti

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP	REMARKS XRF
▧						■		Pavement base to 1.0'.		
▧		S-1	☒	6	19	⁘		Medium dense, brown, black, orange, tan fine to coarse Sand and Gravel, Ash, dry.	NR	193
▧		S-2	☒	12	6	⁘		Loose brown, orange, tan, black fine to coarse Sand and Gravel, Ash, trace slag fill to 3.75'.	NR	839
▧								Black Silt, topsoil, moist to 4.0'.		
▧	5	S-3	☒	2	5	▨	CL	Medium stiff, light gray to red Clay with trace silt, moist	NR	846
▧		S-4	☒	22	16	▨		Stiff, red clay, trace silt, moist.	NR	NR
								Bottom of boring at 8.0'.		
	10									
	15									
	20									
	25									

EMCON

BORING/WELL NO. BH-17

SHEET 1 of 1

PROJECT: *Proposed AAM Paint Coating Bldg. Location* **PROJECT NO:** *04428.LS*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Earth Dimensions, Inc.* **RIG:** *Mobil B-61*

GS ELEV: *648.95*
N-S COORD: *9857.82*
E-W COORD: *9652.75*
WL REF ELEV: *NA*
DATE STARTED: *10/24/94*
DATE FINISHED: *10/24/94*
OPERATOR: *R. Windsor*
GEOLOGIST: *KB Galanti*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP	REMARKS XRF
								Pavement base to 0.5'.		
		S-1	☒	4	50/2"			Medium dense, brown fine to coarse Sand with some fine Gravel, moist.	NR	181
		S-2	☒	6	32			Dense, brown, green, gray fine to coarse Sand, some fine Gravel with wood pieces, dry.	0.1	NR
	5	S-3	☒	12	68			Very dense brown, fine to coarse Sand, wood, wet. Changes to green fine to coarse Sand with some fine Gravel.	NR	NR
		S-4	☒	2	12			Wood caught in spoon. Poor recovery.	NR	122
							CH	Soft, black, organic Silt with glass fragments to 9.0'.		
		S-5	☒	15	5		CL	Medium stiff, gray-red Clay, wet.	NR	4653
	10							Bottom of boring at 10.0'.		
	15									
	20									
	25									

EMCON

BORING/WELL NO. BH-18

SHEET 1 of 1

PROJECT: Proposed AAM Paint Coating Bldg. Location
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.

PROJECT NO: 04428.LS
RIG: Mobil B-61

GS ELEV: 646.04
N-S COORD: 9859.33
E-W COORD: 9752.27
WL REF ELEV: NA
DATE STARTED: 10/24/94
DATE FINISHED: 10/24/94
OPERATOR: R. Windsor
GEOLOGIST: WS Weatherford

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP	REMARKS XRF
▨						■		Pavement base to 1.0'.		
▨		S-1	☒	8	9	⁘		Loose, brown, tan, orange, black fine to coarse Sand, Ash, fine Gravel, moist. Very loose, black, orange, brown, tan fine to coarse sand with ash and trace slag, wet.	NR	84
▨		S-2	☒	8	3	⁘			NR	604
▨	5	S-3	☒	8	7	⁘		Loose, brown white fine to medium Sand and ash to 5.25'.	NR	575
						▨	CL	Medium stiff, gray-red Clay, moist.		
								Bottom of boring at 6.0'.		
	10									
	15									
	20									
	25									

EMCON

BORING/WELL NO. BH-19

SHEET 1 of 1

PROJECT: Proposed AAM Paint Coating Bldg. Location
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.
PROJECT NO: 04428.LS
RIG: Mobil B-61

GS ELEV: 646.63
N-S COORD: 9869.52
E-W COORD: 9952.84
WL REF ELEV: NA
DATE STARTED: 10/24/94
DATE FINISHED: 10/24/94
OPERATOR: R. Windsor
GEOLOGIST: WS Weatherford

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP	REMARKS XRF
▨						■		Pavement base to 1.0'.		
▨		S-1	☒	6	21	△		Medium dense, brown, fine to coarse Gravel, dry to 2.0'.	NR	NR
▨		S-2	☒	8	4	⁘		Very loose, gray, brown, orange, tan fine to coarse Sand, Ash, some Silt and glass fragments, moist, to 4.0'.	NR	3182
▨	5	S-3	☒	24	11	▨	CL	Stiff, red to gray Clay, moist.	NR	NR
								Bottom of boring at 6.0'.		
	10									
	15									
	20									
	25									

EMCON

BORING/WELL NO. BH-20

SHEET 1 of 1

PROJECT: *Proposed AAM Paint Coating Bldg. Location*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Earth Dimensions, Inc.*

PROJECT NO: *04428.LS*
RIG: *Mobil B-61*

GS ELEV: *648.15*
N-S COORD: *9758.95*
E-W COORD: *9651.87*
WL REF ELEV: *NA*
DATE STARTED: *10/24/94*
DATE FINISHED: *10/24/94*
OPERATOR: *R. Windsor*
GEOLOGIST: *WS Weatherford*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP	REMARKS XRF
								Pavement base to 0.5'.		
		S-1	☒	8	28			Medium dense, white, brown, green fine to coarse Sand with some fine Gravel.	NR	NR
		S-2	☒	12	82			Very dense, brown, green, gray, tan fine to coarse Sand, some fine silt, dry.	NR	NR
	5	S-3	☒	8	8			Loose green, brown, tan, white, red fine to coarse Sand with some slag, dry, to 6.0'.	NR	NR
		S-4	☒	8	3			Loose gray, brown, tan, red fine to coarse Sand, Ash with some fine Gravel and slag.	NR	1278
		S-5	☒	12	7			Medium dense, gray, brown, tan, red fine to coarse Sand, Ash, some fine Gravel, slag to 9.0'		
	10						CL	Medium stiff brownish red Clay, wet.	NR	NR
								Bottom of boring at 10.0'.		
	15									
	20									
	25									

EMCON

BORING/WELL NO. BH-21

SHEET 1 of 1

PROJECT: Proposed AAM Paint Coating Bldg. Location
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.

PROJECT NO: 04428.LS
RIG: Mobil B-61

GS ELEV: 646.13
N-S COORD: 9769.65
E-W COORD: 9850.96
WL REF ELEV: NA
DATE STARTED: 10/24/94
DATE FINISHED: 10/24/94
OPERATOR: R. Windsor
GEOLOGIST: WS Weatherford

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP	REMARKS XRF
▨						■		Pavement base to 1.0'.		
▨		S-1	☒	6	32	⁘		Dense, dark brown,tan, fine to coarse Sand, Ash with medium Gravel, dry to 2.0'.	NR	411
▨		S-2	☒	12	8	⁘		Loose, white, black, red, brown, fine to coarse Sand, Ash, moist.	NR	305
▨						⁘		Very loose, white, black, red, brown fine to coarse Sand, Ash to 5.25'.		
▨	5	S-3	☒	8	2	▨	CL	Very soft brown to red Clay, with trace slag, moist.	NR	NR
								Bottom of boring at 6.0'.		
	10									
	15									
	20									
	25									

EMCON

BORING/WELL NO. BH-22

SHEET 1 of 1

PROJECT: Proposed AAM Paint Coating Bldg. Location
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.

PROJECT NO: 04428.LS

RIG: Mobil B-61

GS ELEV: 646.73
N-S COORD: 9651.19
E-W COORD: 9656.87
WL REF ELEV: NA
DATE STARTED: 10/24/94
DATE FINISHED: 10/24/94
OPERATOR: R. Windsor
GEOLOGIST: WS Weatherford

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP	REMARKS XRF
								Pavement base to 1.0'.		
		S-1	☒	8	42			Dense, brown, red, orange, green fine to coarse Sand, Ash with medium Gravel, dry, to 2.0'.	NR	124
		S-2	☒	6	6			Loose orange, tan, brown, black fine to coarse Sand, Ash with some slag, moist.	NR	892
	5	S-3	☒	6	2			Very loose black, orange, red, brown, tan, gray fine to coarse Sand and Gravel, Ash with some slag, wet.	NR	435
		S-4	☒	18	2			Very loose brown, orange fine to coarse Sand, Ash, fine Gravel to 7.5', wet.	NR	203
							CL	Soft, gray-red Clay, moist.		
								Bottom of boring at 8.0'.		
	10									
	15									
	20									
	25									

EMCON

BORING/WELL NO. BH-23

SHEET 1 of 1

PROJECT: *Proposed AAM Paint Coating Bldg. Location*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Earth Dimensions, Inc.*

PROJECT NO: *04428.LS*
RIG: *Mobil B-61*

GS ELEV: *645.38*
N-S COORD: *9654.51*
E-W COORD: *9757.78*
WL REF ELEV: *NA*
DATE STARTED: *10/24/94*
DATE FINISHED: *10/24/94*
OPERATOR: *D Gramza*
GEOLOGIST: *WS Weatherford*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP	REMARKS XRF
								PAvement base to 1.0'.		
		S-1	☒	8	11			Medium dense, brown, white, orange, gray fine to coarse Sand, Ash with some medium Gravel, dry to 2.0'.	NR	NR
								No recovery. Collect second spoon, no recovery.		
		S-2	☒	0	1				NR	NR
								Very loose brown, tan fine to coarse Sand, Ash, with fine Gravel, some slag to 5.75'		
	5	S-3	☒	6	2				NR	382
							CL	Soft red Clay, wet.		
								Bottom of boring at 6.0'.		
	10									
	15									
	20									
	25									

EMCON

BORING/WELL NO. BH-24

SHEET 1 of 1

PROJECT: Proposed AAM Paint Coating Bldg. Location
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.

PROJECT NO: 04428.LS
RIG: Mobil B-61

GS ELEV: 645.75
N-S COORD: 9657.54
E-W COORD: 9857.88
WL REF ELEV: NA
DATE STARTED: 10/25/94
DATE FINISHED: 10/25/94
OPERATOR: D Gramza
GEOLOGIST: WS Weatherford

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP	REMARKS XRF
▨						■		Pavement base to 1.0'.		
▨		S-1	☒	12	24			Medium dense, brown, greeen, orange, fine to coarse Sand, Ash with some coarse Gravel and some slag, dry.	NR	459
▨		S-2	☒	20	15			Medium dense black, white, gray, orange coarse Sand, Ash with fine to coarse Gravel and some slag, moist.	NR	637
▨	5	S-3	☒	12	21			Dense gray fine to coarse Sand, Ash with some slag to 5.75'.	NR	291
							CL	Stiff, gray Clay, moist.		
								Bottom of boring at 6.0'.		
	10									
	15									
	20									
	25									

EMCON

BORING/WELL NO. BH-25

SHEET 1 of 1

PROJECT: Proposed AAM Paint Coating Bldg. Location
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.

PROJECT NO: 04428.LS
RIG: Mobil B-61

GS ELEV: 646.30
N-S COORD: 9661.00
E-W COORD: 9957.23
WL REF ELEV: NA
DATE STARTED: 10/25/94
DATE FINISHED: 10/25/94
OPERATOR: D Gramza
GEOLOGIST: WS Weatherford

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP	REMARKS XRF
								Pavement base to 1.0'.		
		S-1		6	35			Medium dense, lt. brown, white, green, gray fine to coarse Sand with coarse Gravel.	NR	NR
		S-2		9	50/3"			Dense brown, green, gray, fine to coarse Sand with some red, green medium to coarse Gravel, moist.	NR	NR
	5	S-3		12	4			Very loose, white, black, green fine to coarse Sand and Ash with some silt, wet.	NR	735
		S-4		12	10			Very loose, white, black, green fine to coarse Sand and Ash to 7.0'.	NR	NR
							CL	Stiff red Clay, wet.		
								Bottom of boring at 8.0'.		
	10									
	15									
	20									
	25									

EMCON

BORING/WELL NO. BH-26

SHEET 1 of 1

PROJECT: *Proposed AAM Paint Coating Bldg. Location*
CLIENT: *General Motors Corporation*
CONTRACTOR: *Earth Dimensions, Inc.*

PROJECT NO: *04428.LS*

RIG: *Mobil B-61*

GS ELEV: *645.38*
N-S COORD: *9562.82*
E-W COORD: *9860.95*
WL REF ELEV: *NA*
DATE STARTED: *10/25/94*
DATE FINISHED: *10/25/94*
OPERATOR: *D Gramza*
GEOLOGIST: *WS Weatherford*

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP	REMARKS XRF
								Pavement base to 1.0'.		
		S-1	☒	6	27			Medium dense, brown, tan fine to coarse Sand with some medium Gravel, dry to 2.0'.	NR	NR
		S-2	☒	12	14			Medum dense red, brown, gray fine to coarse Sand, Ash with medium Gravel, moist.	NR	688
	5	S-3	☒	12	4			Very loose brown, gray fine to coarse Sand, Ash with little slag to 5.5', wet.	NR	708
							CL	Soft gray, red Clay, moist.		
								Bottom of boring at 6.0'.		
	10									
	15									
	20									
	25									

EMCON

BORING/WELL NO. BH-27

SHEET 1 of 1

PROJECT: Proposed AAM Paint Coating Bldg. Location
CLIENT: General Motors Corporation
CONTRACTOR: Earth Dimensions, Inc.

PROJECT NO: 04428.LS
RIG: Mobil B-61

GS ELEV: 645.93
N-S COORD: 9563.45
E-W COORD: 9961.22
WL REF ELEV: NA
DATE STARTED: 10/25/94
DATE FINISHED: 10/25/94
OPERATOR: D Gramza
GEOLOGIST: WS Weatherford

GROUNDWATER DATA (feet)

DATE	GW DEPTH	GW ELEV	INTAKE
NA	NA	NA	NA

	CASING	SAMPLE	TUBE	CORE
TYPE	HSA	SS		
DIAM.	3.25"	2"		
WEIGHT		140#		
FALL		30"		

WELL CONSTRUCT	DEPTH (feet)	SAMPLE NUMBER	SAMPLE & TYPE	RECOVERY (inches)	N-VALUE	LOG	UNIFIED	FIELD DESCRIPTION (Modified Burmister)	REMARKS HSP	REMARKS XRF
								Pavement base to 1.0'.		
		S-1	☒	9	21			Medium dense, lt. brown, green fine to coarse Sand with coarse Gravel, some brown silt, dry to 2.0'.	NR	NR
		S-2	☒	14	3			Very loose brown, green, white, black fine to coarse Sand, Ash with some silt and slag, moist.	NR	NR
	5	S-3	☒	12	4			Very loose, white, black, white, brown fine to coarse Sand, Ash with some slag, wet, to 6.0'.	NR	413
		S-4	☒	12	6		CH	Loose black, gray Silt, little fine Sand, topsoil, to 7.5', wet.	NR	14
							CL	Medium stiff, gray Clay with trace organics, wet.		
								Bottom of boring at 8.0'.		
	10									
	15									
	20									
	25									

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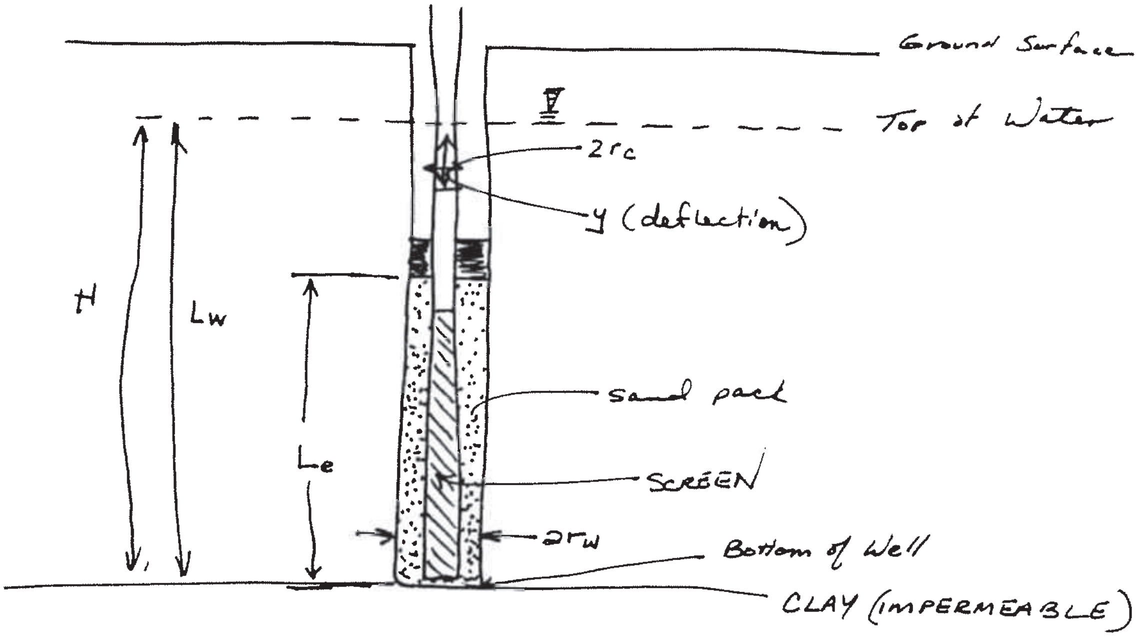
DATE 04853
SHEET NO. 1 OF 2

From Bouer & Rice



$$K = \frac{r_c^2 \ln\left(R_e/r_w\right)}{2L_e} \frac{1}{t} \ln \frac{y_0}{y_t}$$

$$\boxed{r_{ce} = \left[(1-n)r_c^2 + nr_w^2\right]^{1/2}}$$

r_c = radius of well casing
R_e = effective radius
r_w = radius of sandpack
H = thickness of water from bottom of aquifer to static water level
y = deflection of H_2O Level
y_0 = y intercept @ $t=0$

y_t = deflection of H_2O @ time t

L_w = height of water in well

r_{ce} = corrected radius of well for water level deflection measurement in screened zone
n = porosity of sand pack. Typically $n = 0.3$.

For $H = L_w$:

$$\ln R_e/r_w = \left[\frac{1.1}{\ln(L_w/r_w)} + \frac{C}{L_e/r_w} \right]^{-1}$$

for $H > L_w$:

$$\ln R_e/r_w = \left[\frac{1.1}{\ln L_w/r_w} + \frac{A + B \ln\left[(H - L_w)/r_w\right]}{L_e/r_w} \right]^{-1}$$

APPENDIX E

HYDRAULIC CONDUCTIVITY CALCULATIONS

SUMMARY OF HYDRAULIC CONDUCTIVITY VALUES

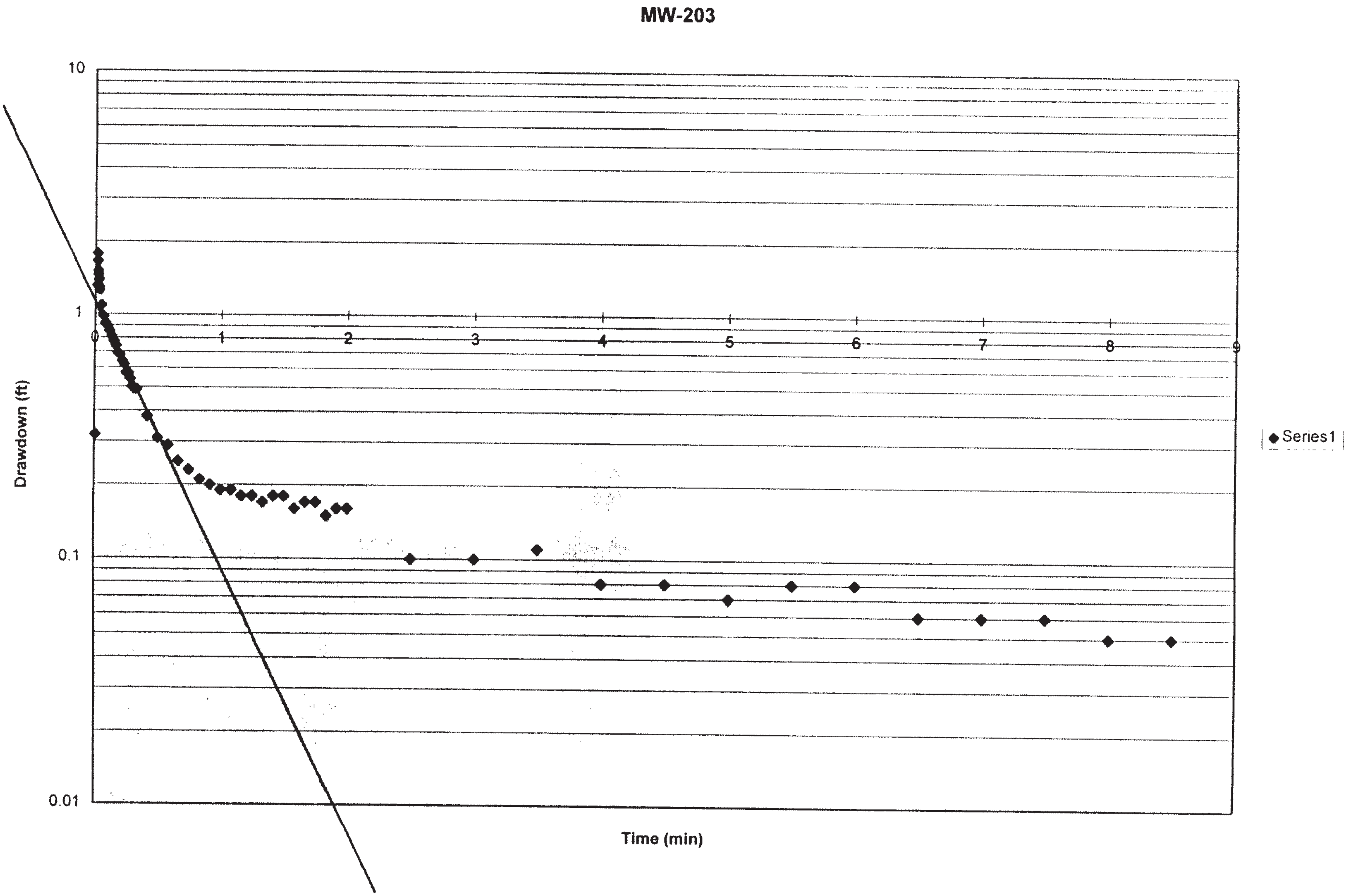
MONITORING WELL	K VALUE
MW-200	Instantaneous recharge, test not completed.
MW-201	4.14×10^{-4} cm/sec
MW-202	8.7×10^{-3} cm/sec
MW-203	2.265×10^{-2} cm/sec
MW-204	1.13×10^{-3} cm/sec
MW-205	7.147×10^{-3} cm/sec
MW-206	1.968×10^{-2} cm/sec
MW-207	1.642×10^{-2} cm/sec
RW-95-1	$2.07\text{x}10^{-2}$ cm/sec

MW-203

r_c 0.0833 = radius of well casing (ft)
R 0.26 = radius of well and sand pack (ft)
R_e 2.592565 = effective radius of well (ft)
L_e 4.5 = length of the screen or open section of well (ft)
L_w 6.46 = distance from water table to bottom of screen (ft)
H_1 1.09 = drawdown at time t_1 (ft)
H_2 0.31 = drawdown at time t_2 (ft)
t_1 0.05 = time (min)
t_2 0.5 = time (min)
C 1.6 = dimensionless constant
L_e/R 17.30769 = basis for dimensionless constant

$\ln {}^{Re}/_{R} = [(1.1/\ln({}^{Lw}/_{R}))+(C/({}^{Le}/_{R}))]^{-1}$
$\ln {}^{Re}/_{R} =$ 2.299721
${}^{Re}/_{R} =$ 9.971405
$R_e =$ 2.592565

$K=[(r_c{}^{2}*\ln({}^{Re}/_{R})/2Le)*{}^{1}/_{(t2-t1)}*\ln({}^{H1}/_{H2})]$
K= 0.044587 ft/min.
K= 0.02265 cm/sec


MW-203
Drawdown (ft)
10
1
0.1
0.01
0
1
2
3
4
5
6
7
8
9
Time (min)
Series1

MW-203

Time	Depth	Drawdown
0	-3.49	0
0.0066	-3.17	0.32
0.0099	-2.18	1.31
0.0133	-1.71	1.78
0.0166	-1.83	1.66
0.02	-1.98	1.51
0.0233	-2.03	1.46
0.0266	-2.1	1.39
0.03	-2.19	1.3
0.0333	-2.23	1.26
0.05	-2.4	1.09
0.0666	-2.51	0.98
0.0833	-2.57	0.92
0.1	-2.6	0.89
0.1166	-2.64	0.85
0.1333	-2.68	0.81
0.15	-2.72	0.77
0.1666	-2.75	0.74
0.1833	-2.8	0.69
0.2	-2.81	0.68
0.2166	-2.85	0.64
0.2333	-2.87	0.62
0.25	-2.92	0.57
0.2666	-2.92	0.57
0.2833	-2.95	0.54
0.3	-2.99	0.5
0.3166	-3	0.49
0.3333	-3	0.49
0.4167	-3.11	0.38
0.5	-3.18	0.31
0.5833	-3.2	0.29
0.6667	-3.24	0.25
0.75	-3.26	0.23
0.8333	-3.28	0.21
0.9167	-3.29	0.2
1	-3.3	0.19
1.0833	-3.3	0.19
1.1667	-3.31	0.18
1.25	-3.31	0.18
1.3333	-3.32	0.17
1.4166	-3.31	0.18
1.5	-3.31	0.18
1.5833	-3.33	0.16
1.6667	-3.32	0.17
1.75	-3.32	0.17
1.8333	-3.34	0.15
1.9167	-3.33	0.16
2	-3.33	0.16
2.5	-3.39	0.1
3	-3.39	0.1
3.5	-3.38	0.11

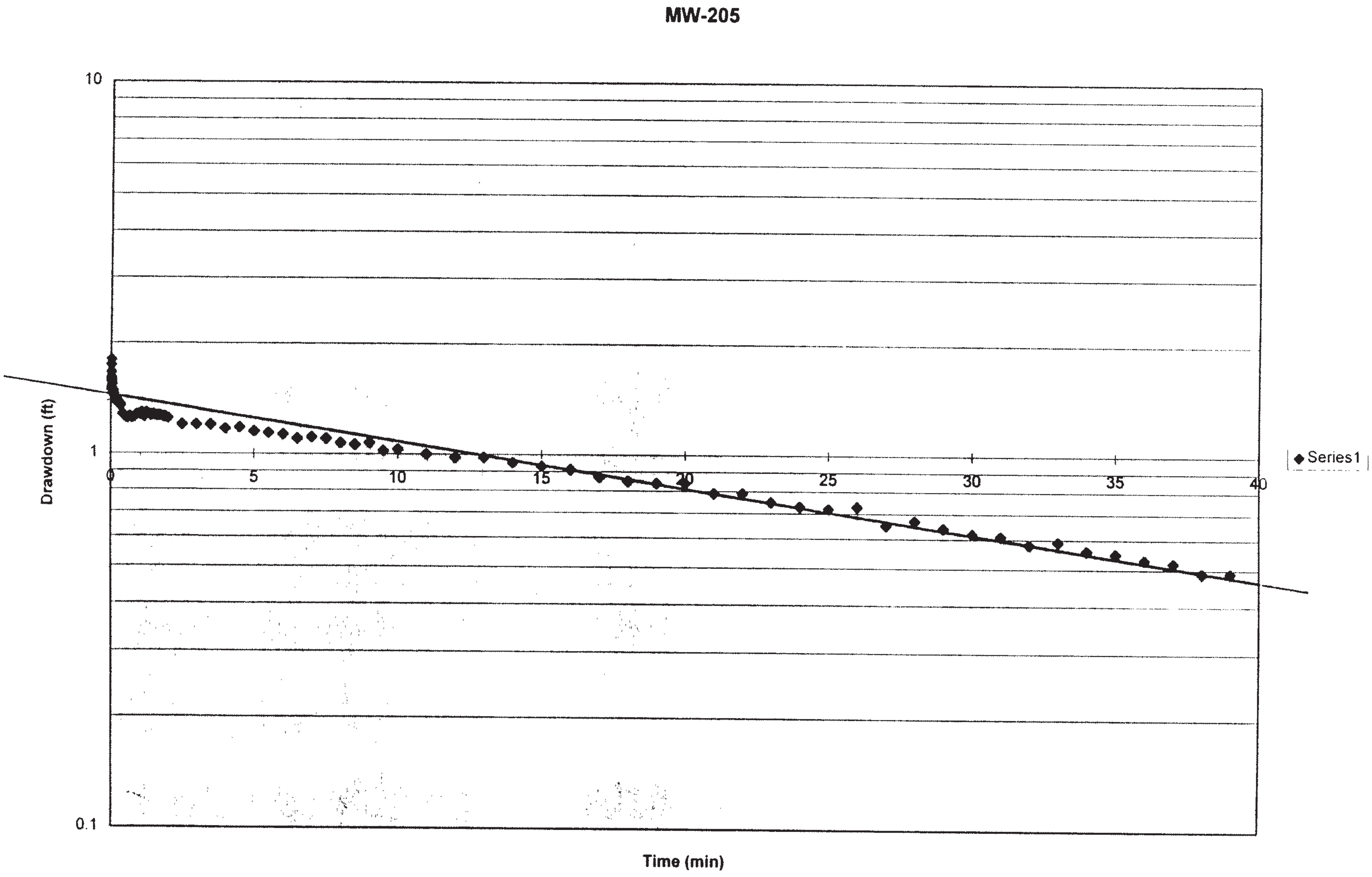
4	-3.41	0.08
4.5	-3.41	0.08
5	-3.42	0.07
5.5	-3.41	0.08
6	-3.41	0.08
6.5	-3.43	0.06
7	-3.43	0.06
7.5	-3.43	0.06
8	-3.44	0.05
8.5	-3.44	0.05

MW-205

r_c 0.0833 = radius of well casing (ft)
R 0.26 = radius of well and sand pack (ft)
R_e 1.228115 = effective radius of well (ft)
L_e 1.5 = length of the screen or open section of well (ft)
L_w 2.69 = distance from water table to bottom of screen (ft)
H_1 1.45 = drawdown at time t_1 (ft)
H_2 0.98 = drawdown at time t_2 (ft)
t_1 0.1 = time (min)
t_2 13 = time (min)
C 1 = dimensionless constant
L_e/R 5.769231 = basis for dimensionless constant

$\ln {}^{Re}/_{R} = [(1.1/\ln({}^{Lw}/_{R}))+(C/({}^{Le}/_{R}))]^{-1}$
$\ln {}^{Re}/_{R} =$ 1.552554
${}^{Re}/_{R} =$ 4.72352
$R_e =$ 1.228115

$K=[(r_c{}^{2}*\ln({}^{Re}/_{R})/2Le)*{}^{1}/_{(t2\text{-}t1)}*\ln({}^{H1}/_{H2})]$
K= 0.014068 ft/min.
K= 0.007147 cm/sec


MW-205
Drawdown (ft)
10
1
0.1
Time (min)
0
5
10
15
20
25
30
35
40
◆ Series1

MW-205

Time	Depth	Drawdown
0	1.34	0
0.0066	3.08	1.74
0.0099	2.83	1.49
0.0133	3.14	1.8
0.0166	2.85	1.51
0.02	3	1.66
0.0233	2.91	1.57
0.0266	2.95	1.61
0.03	2.92	1.58
0.0333	2.92	1.58
0.05	2.88	1.54
0.0666	2.83	1.49
0.0833	2.81	1.47
0.1	2.79	1.45
0.1166	2.78	1.44
0.1333	2.77	1.43
0.15	2.77	1.43
0.1666	2.74	1.4
0.1833	2.74	1.4
0.2	2.74	1.4
0.2166	2.73	1.39
0.2333	2.73	1.39
0.25	2.71	1.37
0.2666	2.72	1.38
0.2833	2.71	1.37
0.3	2.7	1.36
0.3166	2.7	1.36
0.3333	2.69	1.35
0.4167	2.62	1.28
0.5	2.6	1.26
0.5833	2.59	1.25
0.6667	2.6	1.26
0.75	2.59	1.25
0.8333	2.6	1.26
0.9167	2.62	1.28
1	2.62	1.28
1.0833	2.63	1.29
1.1667	2.6	1.26
1.25	2.63	1.29
1.3333	2.62	1.28
1.4166	2.61	1.27
1.5	2.62	1.28
1.5833	2.61	1.27
1.6667	2.61	1.27
1.75	2.61	1.27
1.8333	2.6	1.26
1.9167	2.6	1.26
2	2.59	1.25
2.5	2.54	1.2
3	2.54	1.2
3.5	2.54	1.2

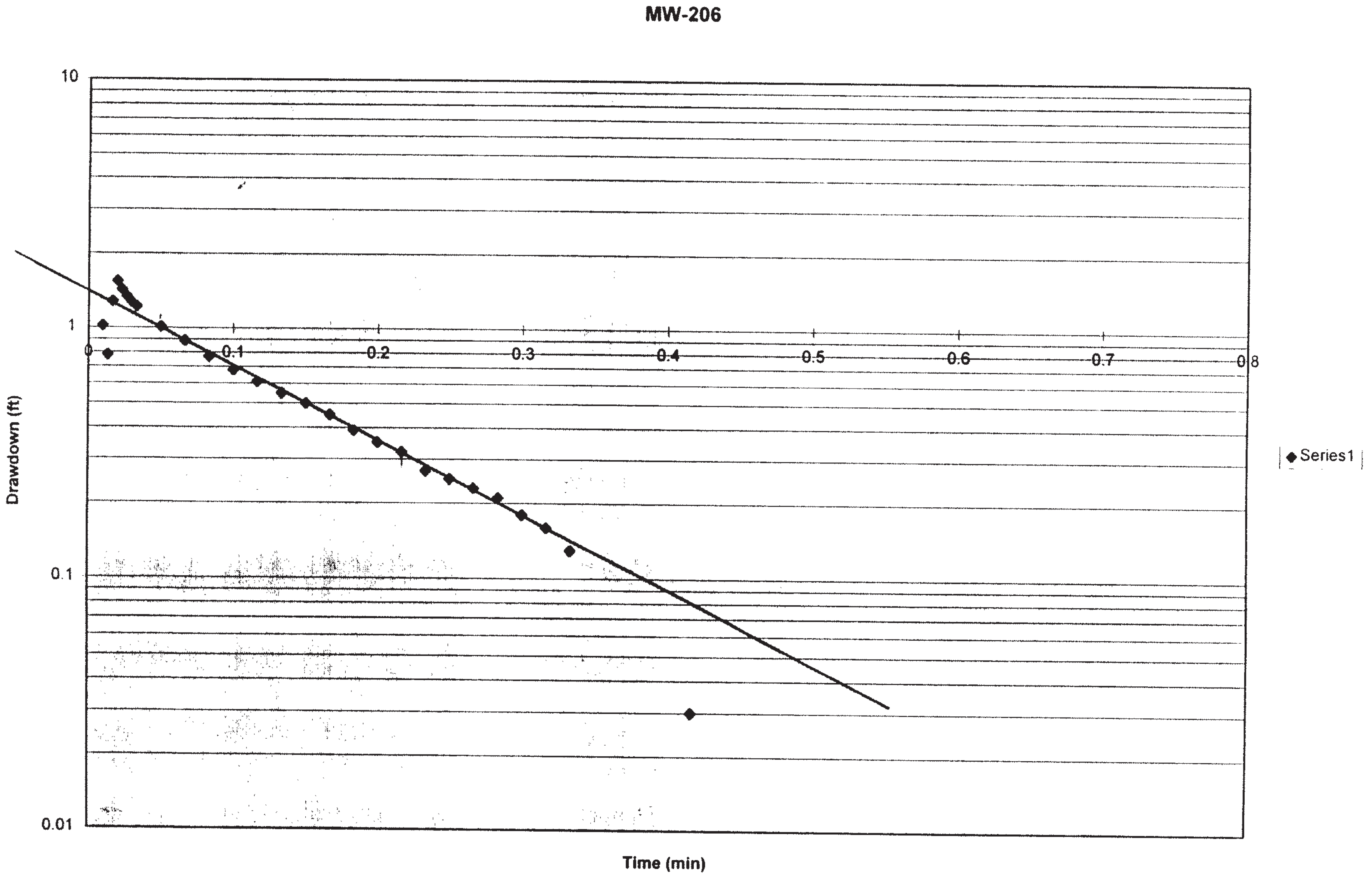
4	2.51	1.17
4.5	2.52	1.18
5	2.49	1.15
5.5	2.48	1.14
6	2.47	1.13
6.5	2.44	1.1
7	2.45	1.11
7.5	2.44	1.1
8	2.41	1.07
8.5	2.4	1.06
9	2.41	1.07
9.5	2.36	1.02
10	2.37	1.03
11	2.34	1
12	2.32	0.98
13	2.32	0.98
14	2.29	0.95
15	2.27	0.93
16	2.25	0.91
17	2.21	0.87
18	2.19	0.85
19	2.18	0.84
20	2.18	0.84
21	2.13	0.79
22	2.13	0.79
23	2.09	0.75
24	2.07	0.73
25	2.06	0.72
26	2.07	0.73
27	1.99	0.65
28	2.01	0.67
29	1.98	0.64
30	1.96	0.62
31	1.95	0.61
32	1.92	0.58
33	1.93	0.59
34	1.9	0.56
35	1.89	0.55
36	1.87	0.53
37	1.86	0.52
38	1.83	0.49
39	1.83	0.49

MW-206

r_c 0.0833 = radius of well casing (ft)
R 0.26 = radius of well and sand pack (ft)
R_e 2.676505 = effective radius of well (ft)
L_e 4.8 = length of the screen or open section of well (ft)
L_w 6.47 = distance from water table to bottom of screen (ft)
H_1 1.01 = drawdown at time t_1 (ft)
H_2 0.32 = drawdown at time t_2 (ft)
t_1 0.05 = time (min)
t_2 0.2166 = time (min)
C 1.6 = dimensionless constant
L_e/R 18.46154 = basis for dimensionless constant

$\ln {}^{Re}/_{R} = [(1.1/\ln({}^{Lw}/_{R}))+(C/({}^{Le}/_{R}))]^{-1}$
$\ln {}^{Re}/_{R} =$ 2.331585
${}^{Re}/_{R} =$ 10.29425
$R_e =$ 2.676505

$K=[(r_c{}^{2}*\ln({}^{Re}/_{R})/2Le)*{}^{1}/_{(t2-t1)}*\ln({}^{H1}/_{H2})]$
K= 0.038741 ft/min.
K= 0.01968 cm/sec


MW-206
10
1
0.1
0.01
Drawdown (ft)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Time (min)
Series1

MW-206

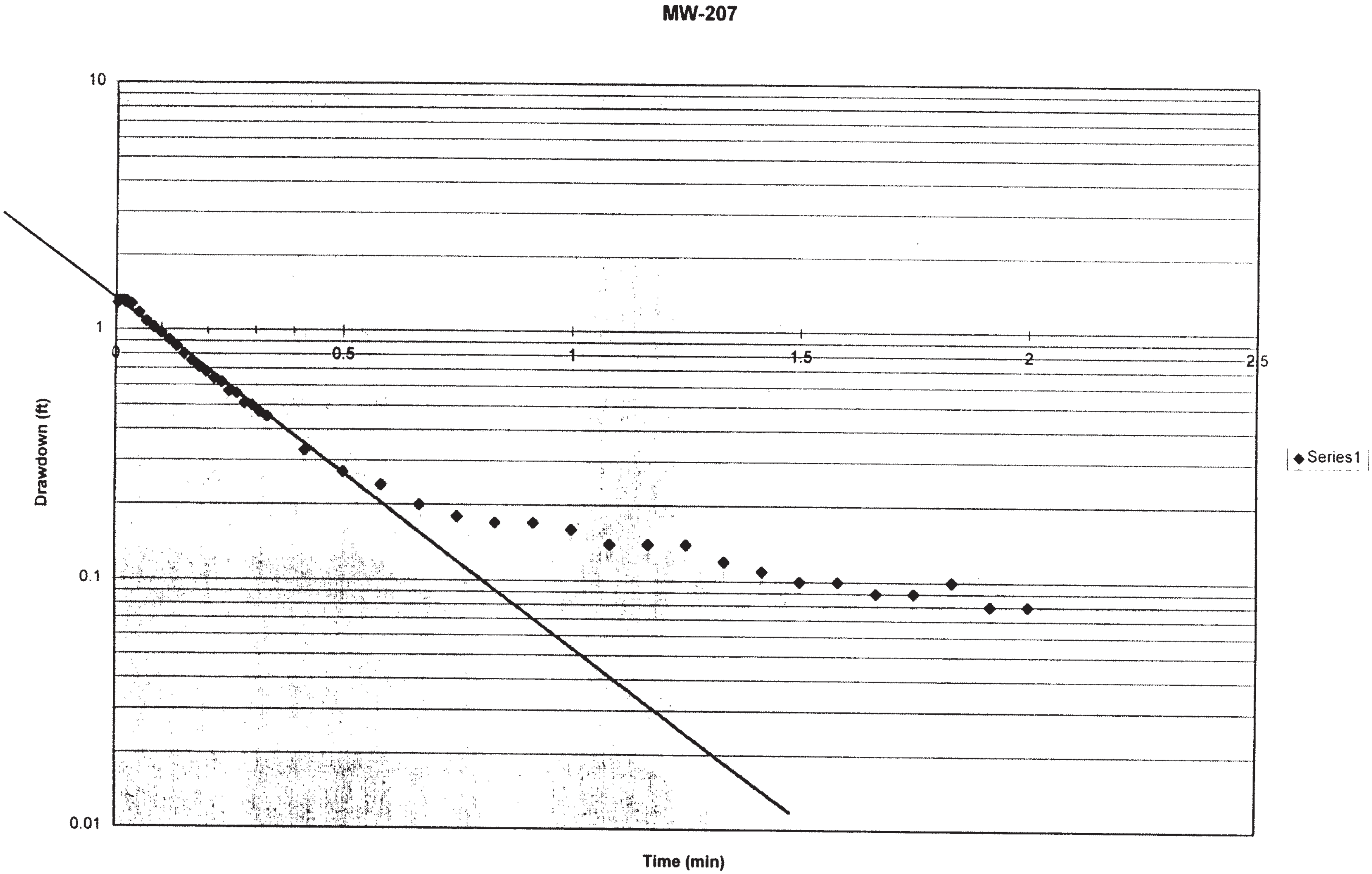
Time	Depth	Drawdown
0	3.73	0
0.0099	4.75	1.02
0.0133	4.51	0.78
0.0166	5.01	1.28
0.02	5.28	1.55
0.0233	5.16	1.43
0.0266	5.07	1.34
0.03	5	1.27
0.0333	4.95	1.22
0.05	4.74	1.01
0.0666	4.62	0.89
0.0833	4.5	0.77
0.1	4.41	0.68
0.1166	4.34	0.61
0.1333	4.28	0.55
0.15	4.23	0.5
0.1666	4.18	0.45
0.1833	4.12	0.39
0.2	4.08	0.35
0.2166	4.05	0.32
0.2333	4	0.27
0.25	3.98	0.25
0.2666	3.96	0.23
0.2833	3.94	0.21
0.3	3.91	0.18
0.3166	3.89	0.16
0.3333	3.86	0.13
0.4167	3.76	0.03
0.5	3.73	0
0.5833	3.72	-0.01
0.6667	3.73	0
0.75	3.73	0

MW-207

r_c 0.0833 = radius of well casing (ft)
R 0.26 = radius of well and sand pack (ft)
R_e 1.498281 = effective radius of well (ft)
L_e 3 = length of the screen or open section of well (ft)
L_w 3.15 = distance from water table to bottom of screen (ft)
H_1 1.02 = drawdown at time t_1 (ft)
H_2 0.27 = drawdown at time t_2 (ft)
t_1 0.0833 = time (min)
t_2 0.5 = time (min)
C 1.5 = dimensionless constant
L_e/R 11.53846 = basis for dimensionless constant

$\ln {}^{Re}/_{R} = [(1.1/\ln({}^{Lw}/_{R}))+(C/({}^{Le}/_{R}))]^{-1}$
$\ln {}^{Re}/_{R} =$ 1.751392
${}^{Re}/_{R} =$ 5.762619
$R_e =$ 1.498281

$K=[(r_c{}^{2}*\ln({}^{Re}/_{R})/2Le)*{}^{1}/_{(t2\text{-}t1)}*\ln({}^{H1}/_{H2})]$
K= 0.032318 ft/min.
K= 0.016418 cm/sec


MW-207
Drawdown (ft)
10
1
0.1
0.01
0
0.5
1
1.5
2
2.5
Time (min)
Series1

MW-207

Time	Depth	Drawdown
0	3.84	0
0.0033	5.12	1.28
0.0066	5.15	1.31
0.0099	5.15	1.31
0.0133	5.15	1.31
0.0166	5.15	1.31
0.02	5.13	1.29
0.0233	5.14	1.3
0.0266	5.12	1.28
0.03	5.11	1.27
0.0333	5.11	1.27
0.05	5.01	1.17
0.0666	4.92	1.08
0.0833	4.86	1.02
0.1	4.81	0.97
0.1166	4.75	0.91
0.1333	4.7	0.86
0.15	4.64	0.8
0.1666	4.59	0.75
0.1833	4.55	0.71
0.2	4.52	0.68
0.2166	4.48	0.64
0.2333	4.46	0.62
0.25	4.41	0.57
0.2666	4.4	0.56
0.2833	4.35	0.51
0.3	4.34	0.5
0.3166	4.31	0.47
0.3333	4.29	0.45
0.4167	4.17	0.33
0.5	4.11	0.27
0.5833	4.08	0.24
0.6667	4.04	0.2
0.75	4.02	0.18
0.8333	4.01	0.17
0.9167	4.01	0.17
1	4	0.16
1.0833	3.98	0.14
1.1667	3.98	0.14
1.25	3.98	0.14
1.3333	3.96	0.12
1.4166	3.95	0.11
1.5	3.94	0.1
1.5833	3.94	0.1
1.667	3.93	0.09
1.75	3.93	0.09
1.8333	3.94	0.1
1.9167	3.92	0.08
2	3.92	0.08
2.5	3.84	0

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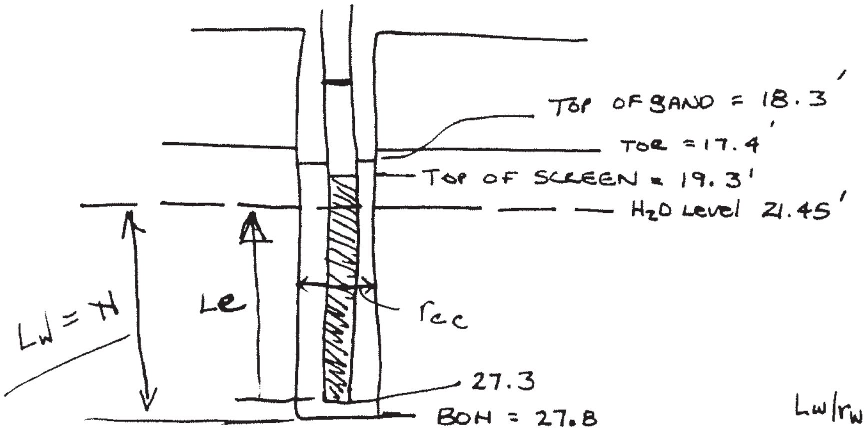


$r_c = 0.0833'$
$L_w = 6.35'$
$L_e =$ [illegible]' 5.85'
$r_w = 0.521'$
SWL = 21.45'
BOH = 27.80'

$L_w/r_w = 12.19$
$L_e/r_w = 11.23$ [illegible]
$C = 1.6$

$y_0 = 1.1$
$t = 75$ sec $y_t = 0.02$
$y_0/y_t = 55$

In sand pack:

$$r_{cc} = \left[(1-n)r_c^2 + n r_w^2\right]^{1/2}$$

$$r_{cE} = \left[(1-0.3)(0.0833)^2 + (0.3)(0.521)^2\right]^{1/2}$$

$r_{cc} =$ [illegible] $0.294'$

$$\ln R_e/r_w = \left[\frac{1.1}{\ln(12.19)} + \frac{1.6}{11.23}\right]^{-1}$$

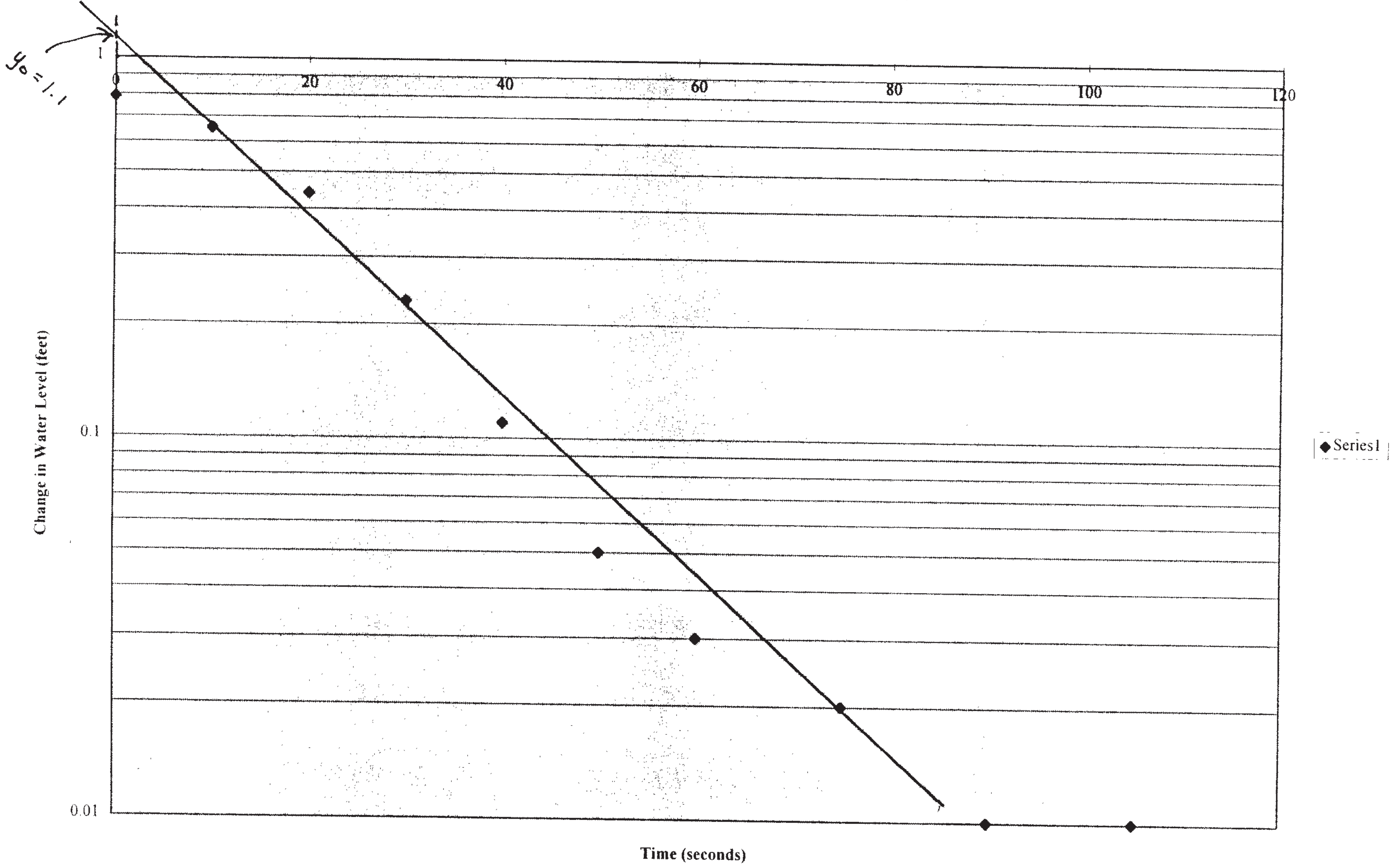
$\ln R_e/r_w = 1.72$

$$K = \frac{r_{cc}^2 \ln R_e/r_w}{2L_e} \frac{1}{t} \ln y_0/y_t$$

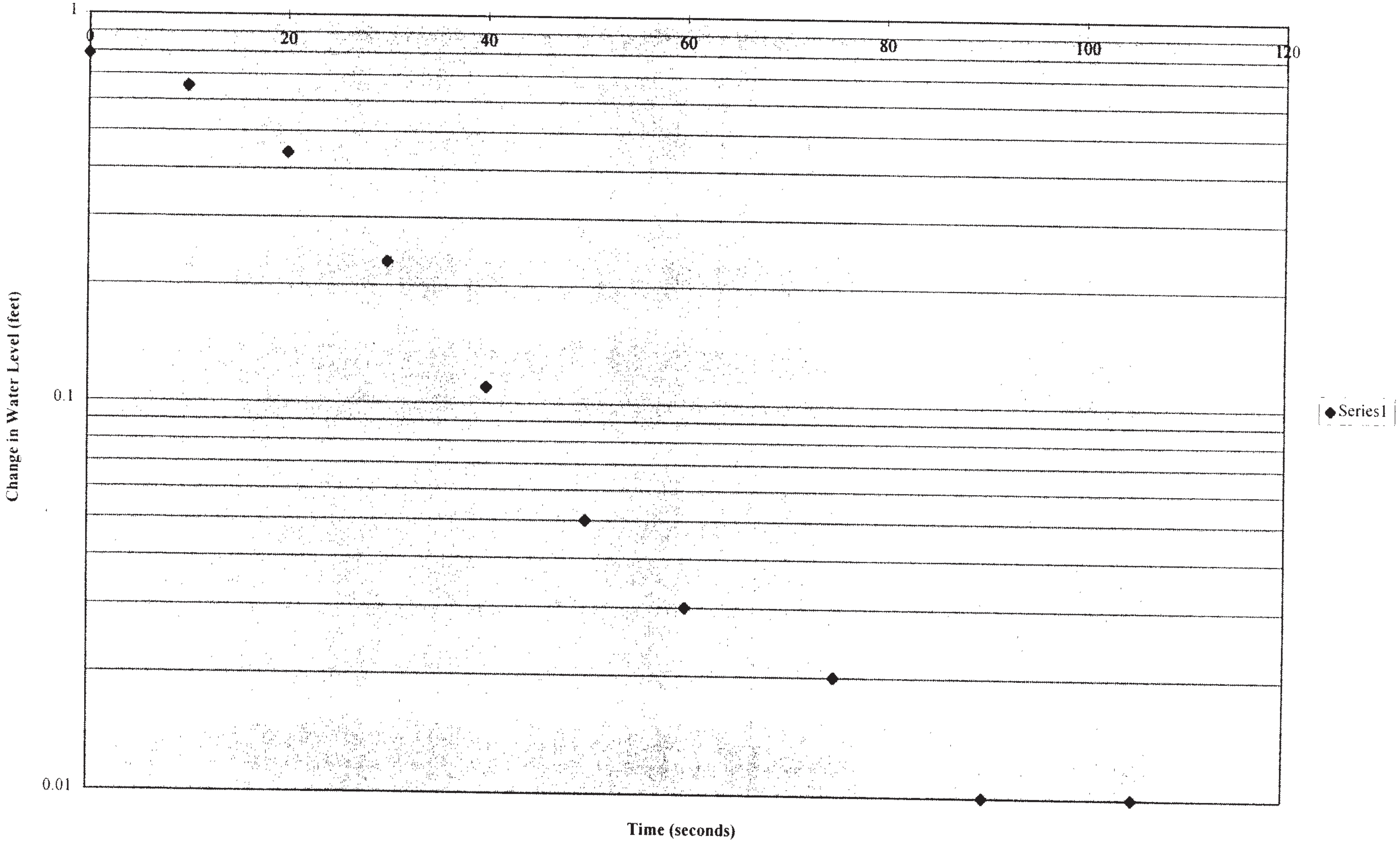
$$K = \frac{(0.294')^2(1.72)}{2(5.85)} \frac{1}{75} \ln 55$$

$$\boxed{\begin{array}{c} K = 6.79 \times 10^{-4} \text{ ft/sec} \\ \text{OR} \\ K = 2.07 \times 10^{-2} \text{ cm/sec} \end{array}}$$

RW-95-1 K-Testing Data (Raising Head Test)



RW-95-1 K-Testing Data (Raising Head Test)



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DATE

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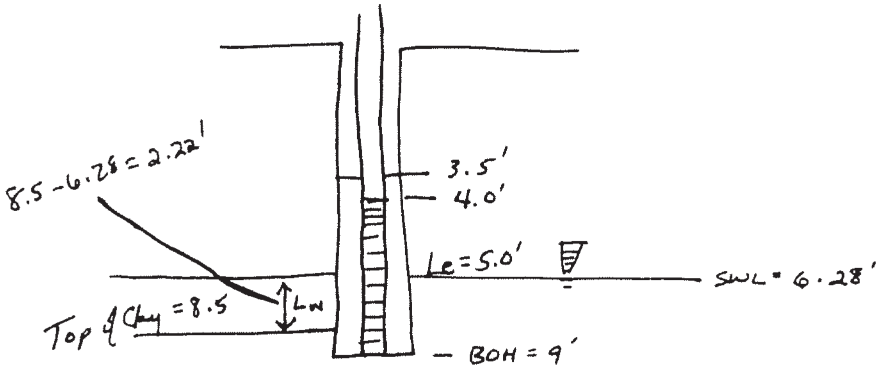
MW-201



$r_c = 0.0833'$

$r_w = 0.27'$

$L_w = 2.22'$

$L_e = 5.00'$

$L_e/r_w = 18.5$

$n = 0.3$

$y_o = 0.26$

$y_t = 0.04$

600=

$y_o/y_t = 6.5$

$L_w/r_w = 8.2$

$C = 1.6$

$$r_{cc} = \left[(1-n)\, r_c^2 + n r_w^2\right]^{1/2}$$

$$r_{cc} = \left[(0.7)(0.833)^2 + (0.3)(0.27)^2\right]^{1/2}$$

$$r_{cc} = 0.163'$$

$$\ln R_e/r_w = \left[\frac{1.1}{\ln(8.2)} + \frac{1.6}{18.5}\right]^{-1}$$

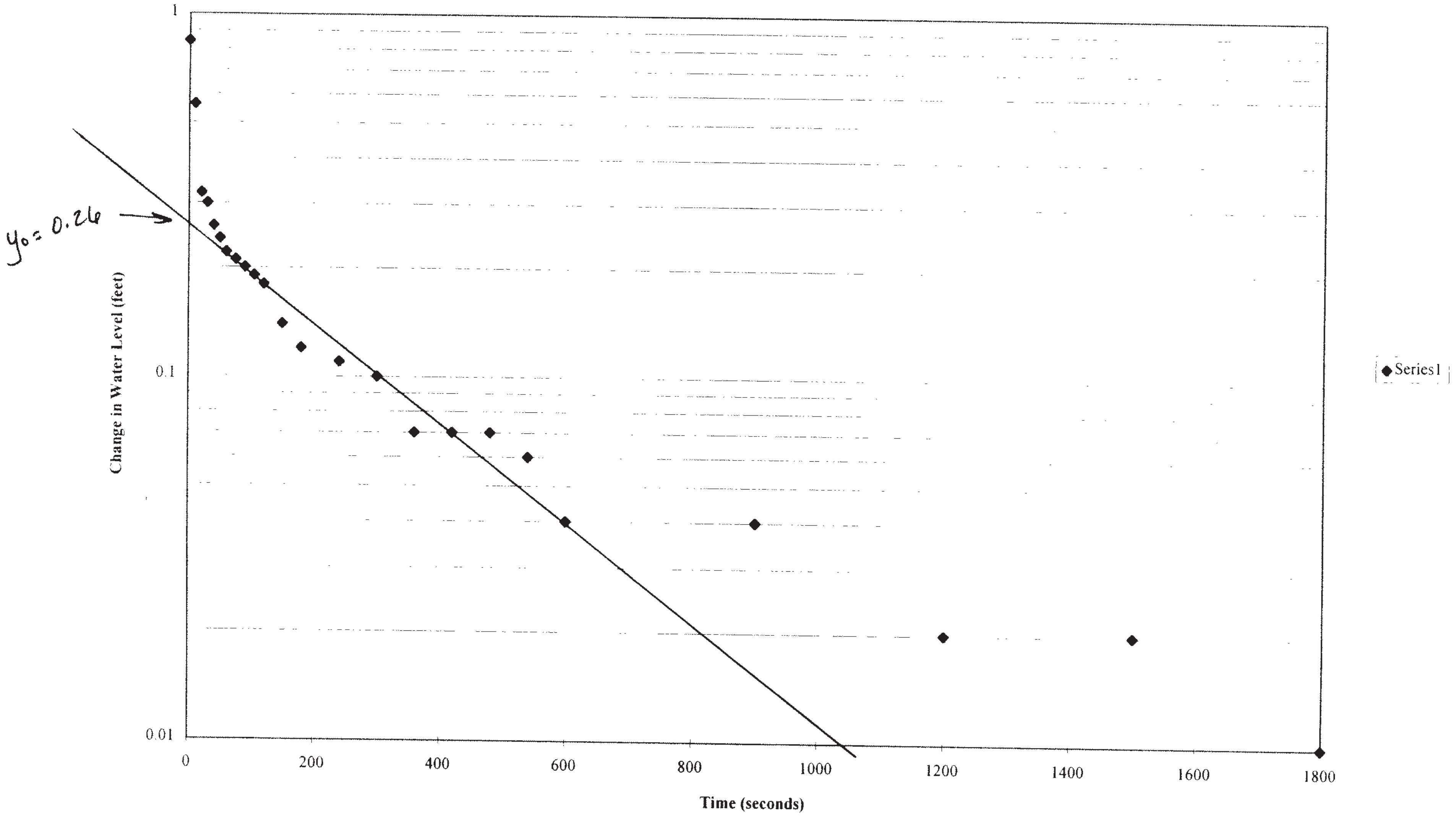
$$= 1.64$$

$$K = \frac{(r_{cc})^2 \ln R_e/r_w}{2 L_e} \frac{1}{t} \ln y_o/y_t$$

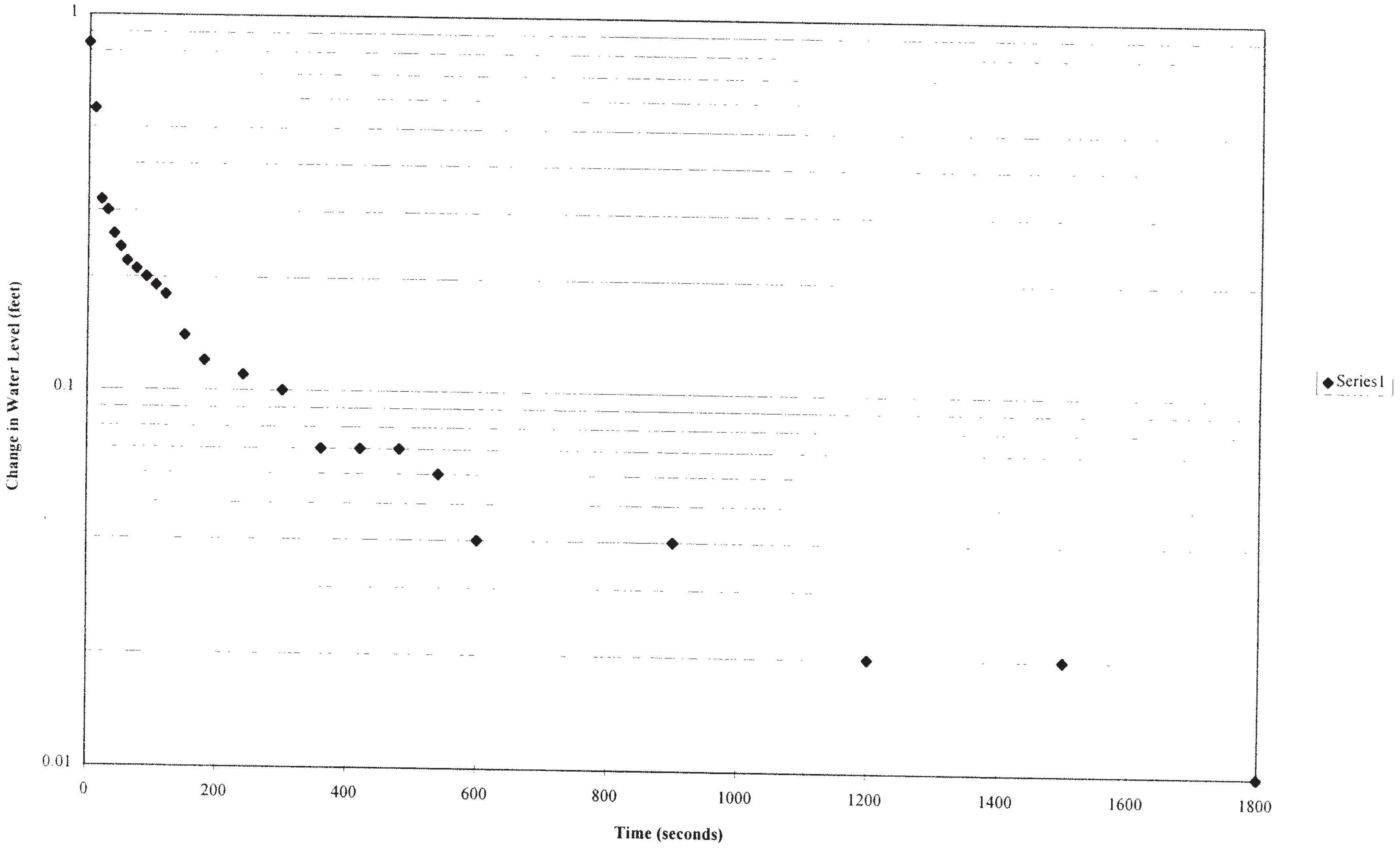
$$= \frac{(0.163)^2 (1.64)}{2(5)} \frac{1}{600} \ln(6.5)$$

$$\boxed{\begin{array}{l} K = 1.36 \times 10^{-5} \text{ ft/sec} \\ \quad \text{OR} \\ K = 4.14 \times 10^{-4} \text{ cm/sec} \end{array}}$$

MW-201 K-Testing Data (Raising Head Test)



MW-201 K-Testing Data (Raising Head Test)



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SUBJECT ______

EMCON

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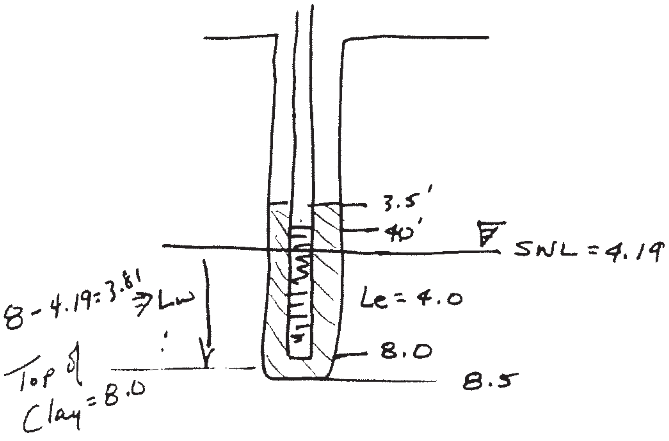
MW - 202



$\Delta y = 4.19' \rightarrow 5.10'$

$r_c = 0.0833'$

$r_w = 0.27'$

$L_w = 3.81$

$L_e = 4.0$

$L_e/r_w = 14.8$ $L_w/r_w = 14.1$

$n = 0.3$

$y_0 = 0.2$

$y_t = 0.02 @ t =$

$y_0/y_t = 10$

$C = 1.75$

Water Rise in Sand Pack:

$$r_{cc} = \left[(1-n) r_c^2 + n r_w^2\right]^{1/2}$$

$$r_{cc} = \left[(0.7)(0.0833)^2 + (0.3)(0.27)^2\right]^{1/2}$$

$$r_{cc} = 0.163'$$

$$\ln R_e/r_w = \left[\frac{1.1}{\ln(14.1)} + \frac{1.75}{14.8}\right]^{-1}$$

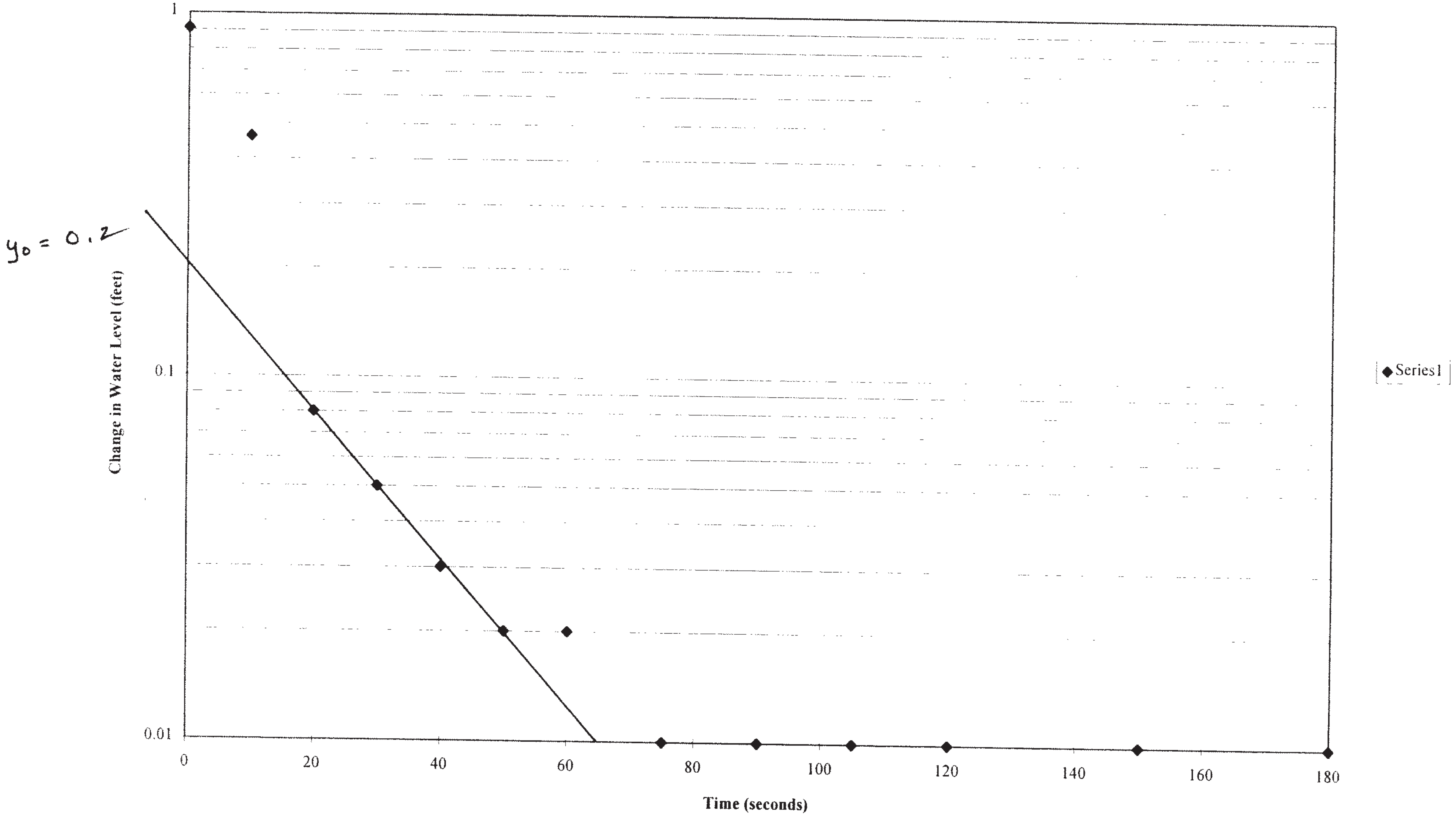
$$= 1.87$$

$$K = \frac{(r_{cc})^2 \ln R_e/r_w}{2 L_e} \frac{1}{t} \ln y_0/y_t$$

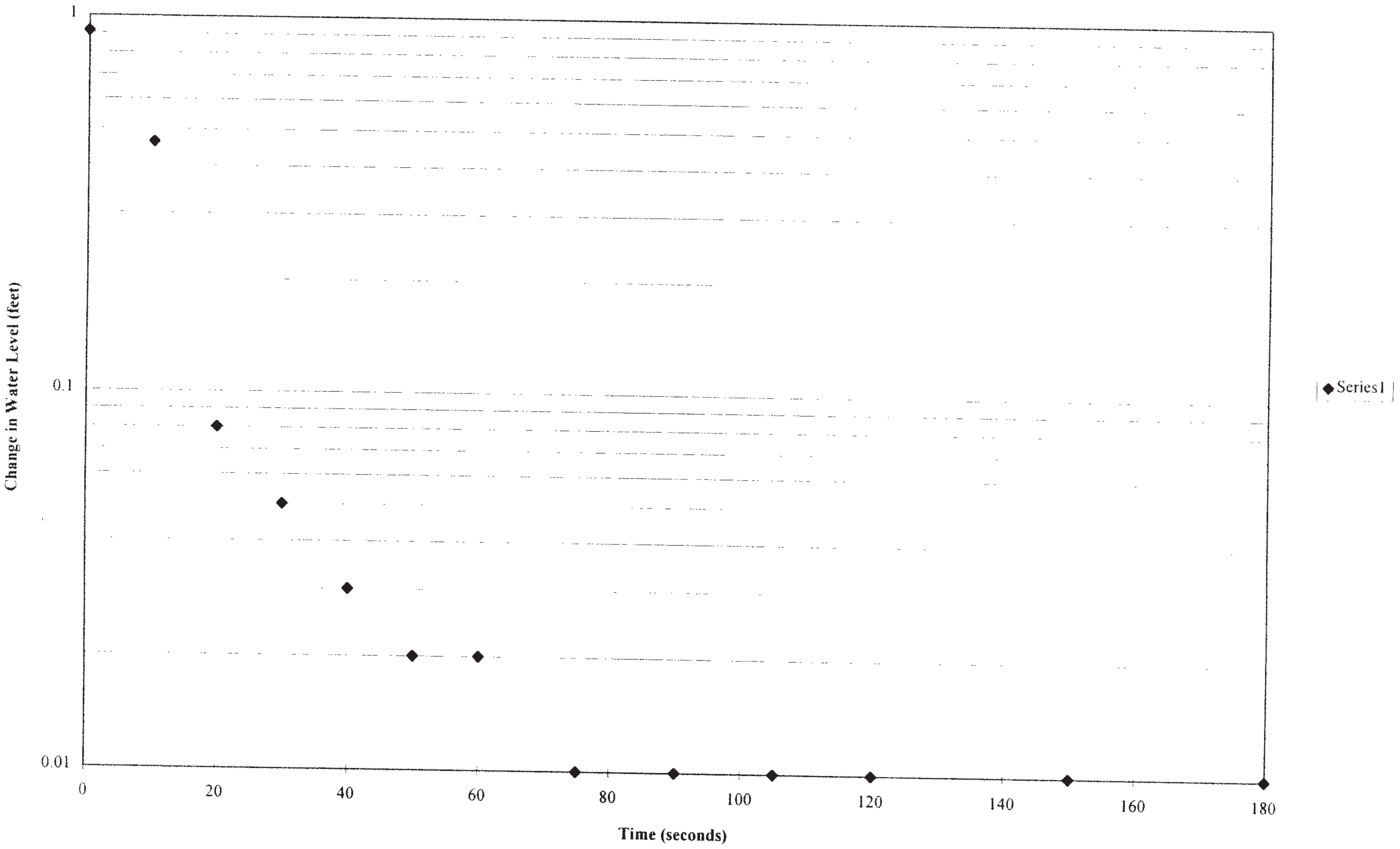
$$= \frac{(0.163)^2 (1.87)}{2(4)} \frac{1}{50} \ln 10$$

$$\boxed{\begin{array}{c} K = 2.86 \times 10^{-4} \text{ ft/sec} \\ \text{or} \\ K = 8.7 \times 10^{-3} \text{ cm/sec} \end{array}}$$

MW-202 K-Testing Data (Raising Head Test)



MW-202 K-Testing Data (Raising Head Test)



BY DJH DATE 5/25/95

CHKD. BY ______ DATE ______

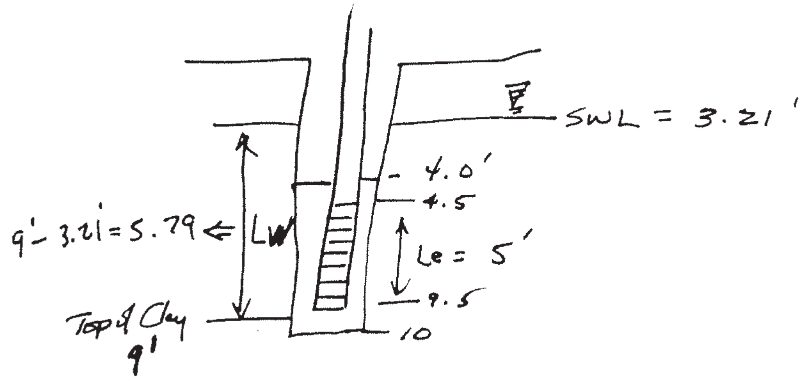
SUBJECT ______

EMCON

DATE ______

SHEET NO. 1 OF 3

MW - 203



$r_c = 0.0833'$

$r_w = 0.27'$

$y_o = 0.68$

$L_w = 5.79$

$L_e = 5'$

@ $t = 75$ sec $y_t = 0.14$

$L_e/r_w = 18.5$ $L_w/r_w = 21.4$ $C = 1.82$

$y_o/y_t = 4.86$

$$\ln R_e/r_w = \left[\frac{1.1}{\ln(21.4)} + \frac{1.82}{18.5} \right]^{-1}$$

$$= 2.186$$

$$K = \frac{(0.0833)^2 \ln R_e/r_w}{2(5)} \frac{1}{75} \ln 4.86$$

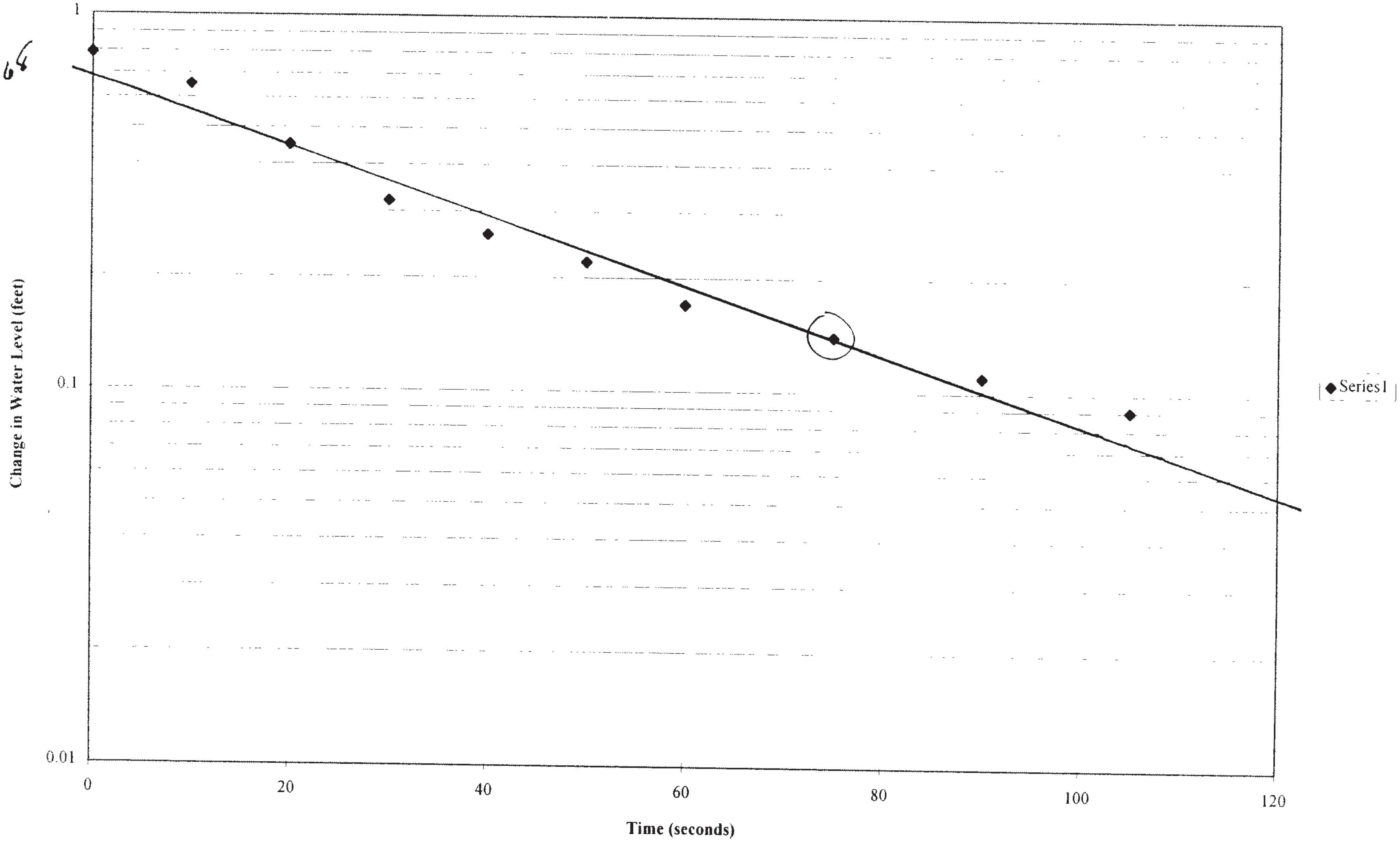
$K = 3.198 * 10^{-5}$ ft/sec

or

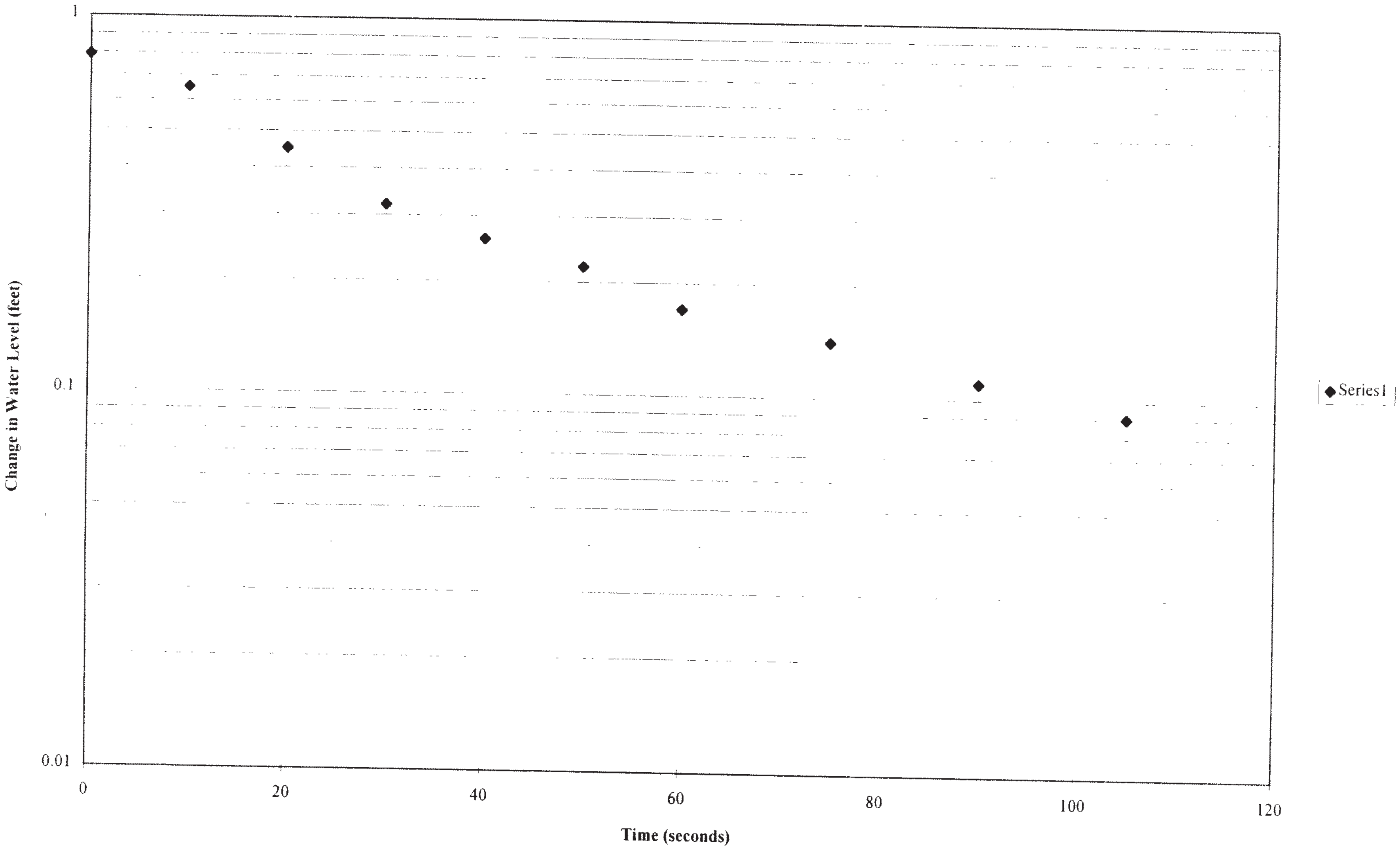
$K = 9.75 * 10^{-4}$ cm/sec

MW-203 K-Testing Data (Raising Head Test)

$y_0 = 0.68$



MW-203 K-Testing Data (Raising Head Test)



BY DJH DATE 5/25/95

CHKD. BY ______ DATE ______

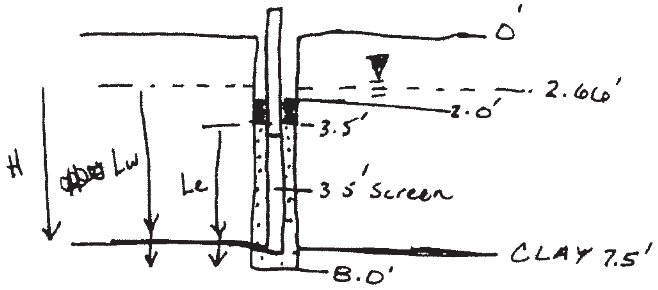
SUBJECT ______

EMCON

DATE ______

SHEET NO. 1 OF 3

MW-204



$y = 0.84'$ (total deflection)

Static H_2O ⇒ 2.66

Top of Clay ⇒ 7.5'

Bottom of Hole ⇒ 8'

$r_c = 0.0833'$

$r_w = 0.27'$

$y_0 = 0.5$

$L_w =$ [redacted] ~~[illegible]~~ 4.84'

$L_e =$ [redacted] ~~[illegible]~~ 4.00'

@ $t = 150$ sec $y_t = 0.02$

$C = 1.8$

$L_w = H$

[redacted] ~~[illegible]~~' $L_e/r_w = 14.8$

$$\ln R_e/r_w = \left[\frac{1.1}{\ln(4.84/0.27)} + \frac{1.8}{14.8} \right]^{-1}$$

= ~~[illegible]~~ 1.989

$$K = \frac{(0.0833)^2 \ln R_e/r_w}{2(4.00')} \frac{1}{150 \text{sec}} \ln \frac{0.5}{0.02}$$

$$K = \frac{~~0.0145~~}{8} \left(\frac{1}{150}\right) \ln 25$$

$K = 3.70 \times 10^{-5}$ ft/sec

~~[illegible]~~

~~K = [illegible] ft/sec * 30.48 cm/ft~~

~~3.29 × 10^-5~~

~~OR~~

~~K = [illegible] × 10^-3 cm/sec~~

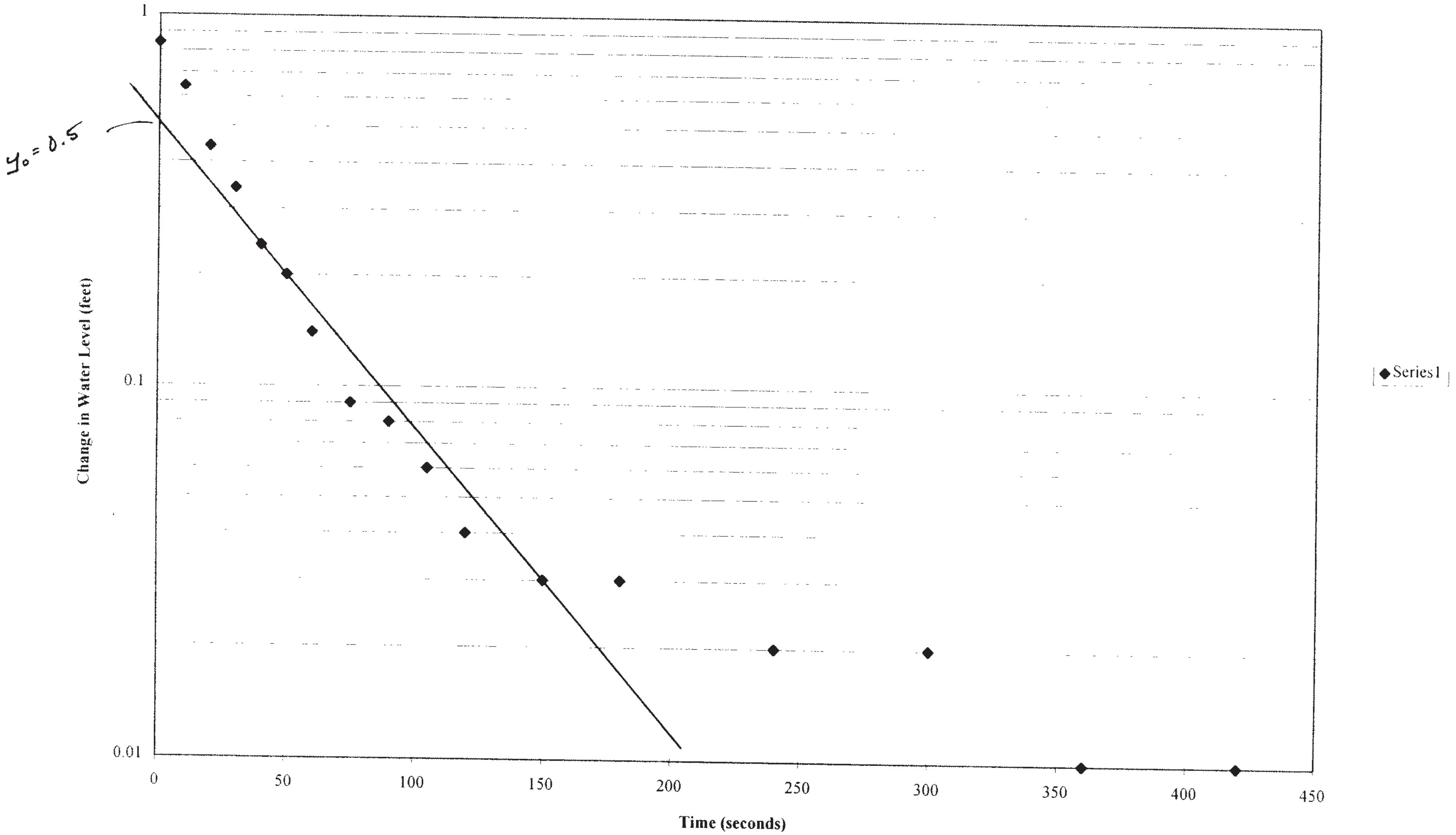
~~1×10^-3~~

$K = 3.70 \times 10^{-5}$ ft/sec

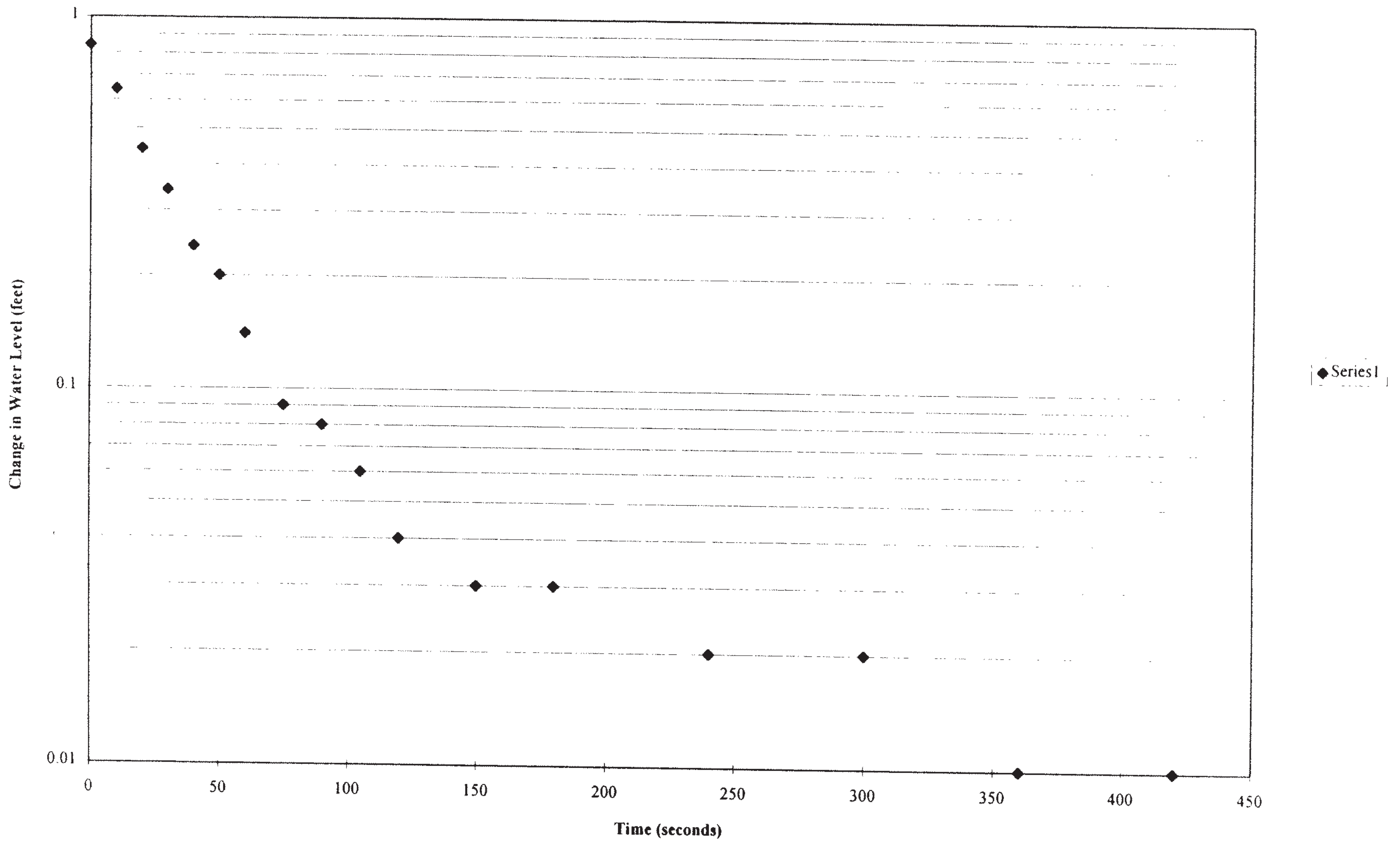
OR

$K = 1.13 \times 10^{-3}$ cm/sec

MW-204 K-Testing Data (Raising Head Test)



MW-204 K-Testing Data (Raising Head Test)



APPENDIX F

DATA VALIDATION REPORTS

Data Validation Services
Cobble Creek Road P. O. Box 208
North Creek, N. Y. 12853
Phone 518-251-4429

February 6, 1997

Kathy Galanti
Wehran Emcon
1775 Baseline Rd. Ste 220
Grand Island, NY 14072

RE: Validation of General Motors Site Data Packages
Northeast Analytical Report of 12-3-96

Dear Ms. Galanti:

Review has been completed for the data package processed for congener specific PCBs by Northeast Analytical. High Resolution GC/Green Bay methodologies were used. Samples reviewed are soil sample MW-207 S-3 and aqueous sample MW-207. A duplicate of the soil was also processed.

Data validation was performed with guidance from the most current editions of the USEPA CLP National Functional Guidelines for Organic Data Review, as best applied to the method. The following items were reviewed:

- Data Completeness
- Custody Documentation
- Holding Times
- Duplicate Correlations
- Preparation/Calibration Blanks
- Control Spike/Laboratory Control Samples
- Calibration Standards
- Sample Result Verification

Unless noted specifically within this test, all items above were found acceptable. Any outlying parameters or recommended edits/qualifications to sample reported results are discussed in the following section.

Congener PCB Analyses

Analysis was performed for individual congener pattern/identification by laboratory method NEA608CAP. The reported results for the samples, which are nondetection at the laboratory method CRQL, are substantiated by the raw data.

There was a delay of seven days between sample collection and laboratory receipt. The samples were extracted within the required technical holding times, and results are unaffected by the delay.

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,

Judy Harry

Judy Harry

Data Validation Services
Cobble Creek Road P. O. Box 208
North Creek, N. Y. 12853
Phone 518-251-4429

November 29, 1996

Kathy Galanti
Wehran Emcon
1775 Baseline Rd. Ste 220
Grand Island, NY 14072

RE: Validation of General Motors Site Data Packages
Upstate SDG Nos. EMC12, EMC13, EMC14, and EMC15
Northeast Analytical Report of 7-18-96

Dear Ms. Galanti:

Review has been completed for the data packages SDGs EMC12 through EMC15 generated by Upstate Labs, pertaining to samples collected at the General Motors Site. Six aqueous and five soil samples were processed for total lead; all but one of those soils, an additional soil, and an additional aqueous sample were analysed for PCBs. Dissolved lead analysis was performed on four of the aqueous samples. Matrix spikes/duplicates were processed for both parameters. Methodologies utilized are those of the 1991 NYSDEC ASP CLP. Three samples were processed for congener specific PCBs by Northeast Analytical.

Data validation was performed with guidance from the most current editions of the USEPA CLP National Functional Guidelines for Organic and Inorganic Data Review, and the EPA SOPs HW-2 and HW-6. The following items were reviewed:

* Data Completeness
* Custody Documentation
* Holding Times
* Surrogate Recoveries
* Matrix Spike Recoveries/Duplicate Correlations
* Preparation/Calibration Blanks
* Control Spike/Laboratory Control Samples
* Calibration Standards
* Instrument IDLs
* Method Compliance
* Sample Result Verification

Those items showing deficiencies are discussed in the following sections of this report. All others were found to be acceptable as outlined in the above-mentioned validation procedures, and as applicable for the methodology. Unless noted specifically in the following text, reported results are substantiated by the raw data, and generated in compliance with protocol requirements.

In summary, sample processing was primarily conducted with compliance to protocol requirements and with adherance to quality criteria. The reported **detected** values for some samples are considered estimated and/or tentative in identification because the sample individual isomer responses do not match well with the standard responses. This is due to extensive sample interferences, and possible weathering of the sample. In addition, the reporting of detected values Upstate Labs was performed in an inconsistent manner as relates to the dual column results (see resubmission communications).

Certain edits to, and qualification of, reported results are indicated. These issues are discussed in the following analytical sections.

Copies of laboratory case narratives and resubmission communications are attached, and should be reviewed in conjunction with this narrative. A compliancy chart and laboratory NYSDEC Sample Preparation and Analysis Summary Forms (some of which were included in resubmission documentation) are also included with this report.

General

Samples in EMC15 were received by Upstate Labs four days after collection. Technical holding times were met, and sample reported results are unaffected.

It is noted that the sample Wash Water contained significant levels of target compounds Aroclor 1248 and lead. The end-user of the data should consider the nature of this sample in association with the other project samples.

PCB-8080 Analyses

Pease see the resubmitted report Form 1A for soil sample MW-205-S-1. The reported results (all nondetection) have been edited to "8.9 U ug/kg". Originally reported values reflected an incorrect moisture content. The sample ID should also have reflectd the "S-1" suffix to avoid confusion with the aqueous sample MW-205.

As noted above, certain reported detected values are considered estimated ("J" flag). They are the following: MW206-S4, MW-203, and MW-206.
In addition, the reported results for Aroclor 1260 in MW206-S4 and Aroclor 1242 in MW-412 should also be considered tentative ("N" flag) due to poor individual isomer correlation.

The reported value for Aroclor 1248 in Drum 1 should be edited to be 11,000 ug/kg (better of the two column results).

Report forms in SDG EMC15 were resubmitted to include client sample ID.

Surrogate recoveries were acceptable (where not diluted beyond detection), with no qualifications indicated.

Matrix spike/duplicate determinations for Aroclor 1248 were performed on MW-205 S1, Wash Water, Drum1, MW-207(S-3), and MW207. Accuracy and precision for MW207(S-3), MW207, and MW-205 were acceptable. Accuracy and precision evaluations for Wash Water and Drun 1 were not possible because of the excessive sample concentration relative to the amount of spike added. Spiked blank recoveries were also good.

The Aroclor 1248 continuing calibration standard processed on 9/24/96 at 5:05 was inadvertantly reported as Aroclor 1242 on the associated standard summary form. The forms 1 for the matrix spikes of MW207(S-3) do not reflect moisture content. These issues do not affect sample results.

Congener PCB Analyses

Analysis was performed for individual congener pattern identification by laboratory method NEA608CAP, with confirmation by GC/MS.

As noted in the data package, the reported identifications of Aroclor 1242/1248 in samples MW-203 and MW-206 S4 should be considered tentative, due to matrix interference prohibiting conclusive identification. The reported value should be considered estimated, possibly biased high (qualifiers "N" and "J" apply).

Surrogate recoveries were acceptable. No sample matrix accuracy and precision determinations were requested or performed. Spiked blank recoveries were acceptable for soil and aqueous matrices.

Total Lead Analyses

Due to low recoveries of the low level standards CRA (42%, 58%, and 45%), reported lead values for MW203D, MW205D, MW206D, and MW207D should be considered estimated (no corrective action was required of the laboratory). Sample MW206D also showed outlying post-digest spike recovery (121%).

Matrix spikes were performed on MW205-T, Drum-1-T, Water-T, MW206(S-3), MW207-T, and MW207(S-3). Aqueous accuracy and precision values were good. Soil accuracy evaluations were not available due to the high sample concentration relative to spike amount added. The soil precision values were below action levels for qualification, but it should be noted that the soil samples consistently showed about to a two fold variance between sample and duplicate values.

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,

Judy Harry

Att.

COMPLIANCY CHART

Project: Wehran Emcon --GM Site

SDG Nos. Upstate SDGs EMC 12,13, EMC 14, and EMC15

Protocol: EPA 8080-Modified

Rec. Date	Sample ID	Matrix	PCB	TPb	DPb	Noncompliancy
07-03-96	WATER	Aqueous	OK	OK	NR	
07-03-96	DRUM1	Soil	OK	OK	NR	
07-03-96	DRUM2	Soil	OK	OK	NR	
07-15-96	MW-205,S-1	Soil	OK	OK	NR	
07-15-96	MW-206,S-3	Soil	OK	OK	NR	
07-15-96	MW-206,S-4	Soil	NR	OK	NR	
07-18-96	MW-203	Aqueous	OK	NR	NR	
07-18-96	MW-205	Aqueous	OK	OK	OK	
07-18-96	MW-206	Aqueous	OK	OK	OK	
07-18-96	MW-412	Aqueous	OK	OK	OK	
09-13-96	MW-207,S-3	Soil	OK	NR	NR	
09-13-96	MW-207	Aqueous	OK	OK	NR	
09-13-96	MW-414	Aqueous	OK	OK	OK	

Narrative

1.0 Summary

This report presents the laboratory test results for five water/soil samples collected from Buffalo, New York. The samples were analyzed for Total Lead & Polychlorinated Biphenyls.

This report is divided into two packages. The Sample Data Summary Package (Volume 1) presents a summary of the test results and quality control data. This abbreviated format is useful to engineers and environmental scientists. The Sample Data Package (Volumes 2-3) is a comprehensive report containing instrument raw data. It is formatted for validation by an independent third party.

2.0 Chain of Custody

The samples were collected by Wehran EMCON on July 2 and 11, 1996 and delivered to Upstate Laboratories, Inc., Syracuse, New York. The Chain of Custody documentation is copied in Volumes 1 & 2.

3.0 Methodology

The analyses were performed using test methods developed by the U.S. Environmental Protection Agency (EPA) under RCRA and reorganized by the New York State Department of Environmental Conservation (NYSDEC) into the Analytical Services Protocol (ASP). The specific method numbers are:

Parameter	Method
PCBs	8080
Pb	239.2 CLP-M

"Analytical Services Protocol", New York State Department of Environmental Protection, 12/91 revision.

4.0 Internal Validation

The following observations are offered.

<u>Holding Time</u> : All criteria were satisfied following the NYSDEC ASP, revision 1991.

<u>Trace Metals</u>

Calibration : All criteria were satisfied.

Method Blanks : All criteria were satisfied.

Reference Samples : All criteria were satisfied.

Matrix Spike : Although not designated on Chain of Custody, matrix spikes were performed on both water & sediment matrices. A high % recovery in the soil MS soil (MW-206 S-3)is attributed to the matrix of the sample.

Duplicates : The %RSD was high for the soil sample MW-206 S-3. A large dilution contributed to lower precision.

PCBs

Calibration : All criteria were satisfied.

Method Blanks : All criteria were satisfied.

Reference Samples : All criteria were satisfied.

Matrix Spike : No site specific MS/MSD were designated on the Chain of Custody Record. Laboratory arbitrarily picked samples to spike. Although a matrix spike was performed on the water sample (Storm Sewer Wash Water), no MSD was performed due to insufficient sample volume.

Surrogates : Surrogates were diluted out for Drum 1 and MW-206 S-4.

Approved

Anthony J. Scala, Director

Narrative

1.0 Summary

This report presents the laboratory test results for four water samples collected from Buffalo, New York. The samples were analyzed for Total/Dissolved Lead & Polychlorinated Biphenyls.

This report is divided into two packages. The Sample Data Summary Package (Volume 1) presents a summary of the test results and quality control data. This abbreviated format is useful to engineers and environmental scientists. The Sample Data Package (Volumes 2-3) is a comprehensive report containing instrument raw data. It is formatted for validation by an independent third party.

2.0 Chain of Custody

The samples were collected by Wehran EMCON on July 16, 1996 and hand delivered to Upstate Laboratories, Inc., Syracuse, New York. The Chain of Custody documentation is copied in Volumes 1 & 2.

3.0 Methodology

The analyses were performed using test methods developed by the U.S. Environmental Protection Agency (EPA) under RCRA and reorganized by the New York State Department of Environmental Conservation (NYSDEC) into the Analytical Services Protocol (ASP). The specific method numbers are:

Parameter	Method
PCBs	8080
Pb	239.2 CLP-M

"Analytical Services Protocol", New York State Department of Environmental Protection, 12/91 revision.

4.0 Internal Validation

The following observations are offered.

Holding Time : All criteria were satisfied following the NYSDEC ASP, revision 1991.

Trace Metals

Calibration : All criteria were satisfied.

Method Blanks : All criteria were satisfied.

Reference Samples : All criteria were satisfied.

Matrix Spike	: Although not designated on Chain of Custody, matrix spike was performed on MW-205. : Post-digestion spike was out (MW206D).
Duplicates	: All criteria were satisfied.

Note : MSAs were conducted on samples MW203T, MW205T, and MW-206T.

PCBs

Calibration	: All criteria were satisfied.
Method Blanks	: All criteria were satisfied.
Reference Samples	: All criteria were satisfied.
Matrix Spike/ MSD	: No MS/MSD was performed due to insufficient sample volume and no site specific MS was designated on the Chain of Custody Record.
Surrogates	: There are high recoveries for DCB.

Approved

Anthony J. Scala, Director

FILE:BNEMCNPB

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		VOA GC/MS Method #	BNA GC/MS Method #	Herbs GC Method #	PCBs Method #	Metals	Other
Storm Sewer Wash Water	18596058	–	–	–	8080	Total Lead	–
Sorm Sewer Sediment Drum 1	18596059	–	–	–	8080	Total Lead	% Solids
Sorm Sewer Sediment Drum 2	18596060	–	–	–	8080	Total Lead	% Solids
MW–205, S–1	19796094	–	–	–	8080	Total Lead	% Solids
MW–206, S–3	19796095	–	–	–	–	Total Lead	% Solids
MW–206, S–4	19796096	–	–	–	8080	–	% Solids

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		VOA GC/MS Method #	BNA GC/MS Method #	Herbs GC Method #	PCBs Method #	Metals	Other
MW–203	20096037	–	–	–	8080	Total/Diss. Lead	–
MW–205	20096038	–	–	–	8080	Total/Diss. Lead	–
MW–206	20096039	–	–	–	8080	Total/Diss. Lead	–
MW–412	20096040	–	–	–	8080	–	–

Narrative

1.0 Summary

This report presents the laboratory test results for three water/soil samples collected from Buffalo, New York. The samples were analyzed for Total/Dissolved Lead & Polychlorinated Biphenyls.

This report is divided into two packages. The Sample Data Summary Package (Volume 1) presents a summary of the test results and quality control data. This abbreviated format is useful to engineers and environmental scientists. The Sample Data Package (Volumes 2-3) is a comprehensive report containing instrument raw data. It is formatted for validation by an independent third party.

2.0 Chain of Custody

The samples were collected by Wehran EMCON on September 9 & 11, 1996 and hand delivered to Upstate Laboratories, Inc., Syracuse, New York. The Chain of Custody documentation is copied in Volumes 1 & 2.

3.0 Methodology

The analyses were performed using test methods developed by the U.S. Environmental Protection Agency (EPA) under RCRA and reorganized by the New York State Department of Environmental Conservation (NYSDEC) into the Analytical Services Protocol (ASP). The specific method numbers are:

Parameter	Method
PCBs	8080
Pb	239.2 CLP-M

"Analytical Services Protocol", New York State Department of Environmental Protection, 12/93 revision.

4.0 Internal Validation

The following observations are offered.

Holding Time : All criteria were satisfied.

Trace Metals

Calibration : All criteria were satisfied.

Method Blanks : All criteria were satisfied.

Reference Samples (LCS) : All criteria were satisfied.

Matrix Spike : MS % recovery was outside control limits for MW-207, S-3 (soil) sample.

Duplicates : Soil R%D for location MW207, S-3 was outside control limits due to high concentrations of lead in the sample.

Note: Dissolved lead sample was filtered and preserved at laboratory upon receipt.

PCBs

Calibration : All criteria were satisfied.

Method Blanks : All criteria were satisfied.

Reference Samples : All criteria were satisfied.

Matrix Spike/ Spike Duplicate : Matrix spikes were performed on MW-207 (water) & MW-207, S-3 (soil).

Surrogates : DCB showed high recovery.

Approved

Anthony J. Scala, Director

FILE:BNEMCNPB

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		VOA GC/MS Method #	BNA GC/MS Method #	VOA GC Method #	PCBs Method #	Metals	Other
MW-207, S-3	25796010	–	–	–	8080	Total Lead	% Solids
MW-207	25796011	–	–	–	8080	Total/Diss. Lead	–
MW-207 MS/MSD/DUPE	25796011	–	–	–	8080	Total/Diss. Lead	–
MW-414	25796012	–	–	–	8080	Total Lead	–

Data Validation Services
Cobble Creek Road P. O. Box 208
North Creek, NY 12853
Phone and Fax (518) 251-4429

October 29, 1996

Anthony Scala
Upstate Laboratories
6034 Corporate Drive
East Syracuse, NY 13057

RE: Wehran Emcon --GM Site data packages; SDGs EMC12-13 and EMC14

Dear Mr. Scala:

Review of the above-mentioned data packages is in progress. The following items are needed prior to completion of the validation report:

A. SDG EMC12-13

1. Only one of the required "NYSDEC Sample Preparation and Analysis Summary Forms" was provided. Please also provide those for the PCB and metals analyses (pgs. B-215 and B-217 of the ASP).

2. The PCB continuing calibration summary form for the Aroclor 1248 standards analysed 7/25/96 (8:27am and 4:15 pm) on column HP-5 is not present in the data package. Please forward for review. (This would follow page 505 of the data package).

3. Although the raw data for the moisture/solids content of soil sample MW-205 (19796094) shows 75% solids, the PCB and lead sample results were reported with a solids content of 85%. Please produce corrected sample result report forms. The matrix spikes of the sample also use 85%; resubmission of those associated report forms is not necessary, because accuracy and precision values would not change with the common factor correction.

4. Please discuss the procedure/policy used for reporting of the PCB results from the primary and confirmation columns. There does not appear to be consistency in which column results (608 or HP-5) were reported for a given sample or given Aroclor mixture, and no explanation is present in the data package. Although column DB-608 appears to be the primary column, HP-5 results are often reported (although not lower in value). In fact, the results for Aroclor 1248 in the matrix spikes of Drum 1 and MW-205 report the HP-5 results onto the Forms 1, and the 608 results onto the Forms 3.

B. SDG EMC14

1. Only one of the required "NYSDEC Sample Preparation and Analysis Summary Forms" was provided. Please also provide those for the PCB and metals analyses (pgs. B-215 and B-217 of the ASP).

2. Please discuss the procedure/policy used for reporting of the PCB results from the primary and confirmation columns. There does not appear to be consistency in which column results (608 or HP-5) were reported for a given sample or given Aroclor mixture, and no explanation is present in the data package. Although column DB-608 appears to be the primary column, HP-5 results are often reported (although not lower in value).

Thank you in advance for an expedited reply to this request. Please also copy Kathy Galanti at Emcon with all communications. Please do not hesitate to contact me if you have questions or comments regarding this letter.

Very truly yours,

Judy Harry

cc: Kathy Galanti

Data Validation Services
Cobble Creek Road P. O. Box 208
North Creek, NY 12853
Phone and Fax (518) 251-4429

November 1, 1996

Anthony Scala
Upstate Laboratories
6034 Corporate Drive
East Syracuse, NY 13057

RE: Wehran Emcon --GM Site data packages; SDGs EMC12,13, EMC14, and EMC15

Dear Mr. Scala:

Review of the above-mentioned data packages is in progress. The following items are needed prior to completion of the validation report:

A. SDG EMC12,13

1. The raw data provided for the lead analysis sequence of 7/23/96 was incomplete. The analyses which are Sequence Nos. 9 through 15, inclusive, were not included. Please forward for review.

B. SDG EMC15

1. The PCB report "Forms 1" for the samples in this delivery group do not reflect client sample ID (laboratory IDs are provided instead). Please edit these report forms to reflect the sample ID (manual edits are acceptable).
2. Only one of the required "NYSDEC Sample Preparation and Analysis Summary Forms" was provided. Please also provide those for the PCB and metals analyses (pgs. B-215 and B-217 of the ASP).

Thank you in advance for an expedited reply to this request. Please also copy Kathy Galanti at Emcon with all communications. Please do not hesitate to contact me if you have questions or comments regarding this letter.

Very truly yours,

Judy Harry

cc: Kathy Galanti

Upstate Laboratories inc.

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New Jersey (201) 703-1324

November 6, 1996

Ms. Judy Harry
Data Validation Services
P.O. Box 208
Cobble Creek Road
North Creek, New York 12853

Re: Wehran EMCON / GM Project
SDG EMC12, EMC13 & EMC14, ULI No. 18596058, 19796094
Response to Data Validation Letter of 10-29-96

Dear Ms. Harry:

This letter is in response to your FAX of 10-29-96.

A. SDG EMC12-13

Item 1. Attached, please find the B-215 and B-217 Forms.

Item 2. Attached, please find the PCB CC summary Form for column HP-5.

Item 3. Attached, please find corrected PCB and Metals Form Is.

Item 4. The procedure used to report PCB results for this site is not the same procedure the laboratory usually uses. It appears the chemist selected the results from the analytical column that ran best that day. However, the values are close to each other on both columns and the data is usable as reported. Should you wish the Form 1s be amended, please do not hesitate to call.

B. SDG EMC14

Item 1. Attached, please find the B-215 and B-217 Forms.

Item 2. See Item 4 above.

Should further questions arise, please feel free to contact me.

Sincerely,

UPSTATE LABORATORIES, INC.

A. Robert Martin
Manager

cc: Kathy Galanti, EMCON, letter only
A. Scala, ULI, letter only

FILE: M103196A

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
PESTICIDE/PCB
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Leached	Date Extracted	Date Analyzed
18596058	Water	7/2/96	7/3/96	–	7/3/96	7/23/96
18596059	Soil	7/2/96	7/3/96	–	7/3/96	7/20/96
18596060	Soil	7/2/96	7/3/96	–	7/3/96	7/20/96
19796094	Soil	7/11/96	7/15/96	–	7/17/96	7/25/96
19796096	Soil	7/11/96	7/15/96	–	7/17/96	7/25/96

PCB

UPSTATE LABORATORIES, INC.
CONTINUING CALIBRATION

S44-0-66 Revised 11/95

Instrument No. 9.0

Column HP-5 ID 0.53mm

Initial Calbr. Date: 3/7/96

Run No. 3 Continuing Calibr. Date 7/25/96 Time 8:27 AM

Aroclor	Peak	RT Windows			Actual (ppb)	Found (ppb)	% Diff.
		RT	From	To			
1248	1	2.51	2.43	2.57	500	560	12
	2	2.71	2.63	2.77			
	3	3.67	3.59	3.73			
	4	4.46	4.37	4.51			
	5						
	6						
	7						
	8						
	9						
	10						

Run No. 14 Continuing Calibr. Date 7/25/96 Time 4:15 PM

Aroclor	Peak	RT Windows			Actual (ppb)	Found (ppb)	% Diff.
		RT	From	To			
1248	1	2.51	2.43	2.57	500	560	12
	2	2.71	2.63	2.77			
	3	3.67	3.59	3.73			
	4	4.46	4.37	4.51			
	5						
	6						
	7						
	8						
	9						
	10						

Criteria:

Methods 8080 & 80	If the CC is >15% of the predicted response, a new 5 point curve is prepared.
EPA Method 608	The laboratory reference sample (RS) serves as a continuing calibration standard

Prepared by: ______________________

Date: ______________________

1A
PCB ANALYSIS DATA SHEET

NYSDEC SAMPLE NO. MW-205

Lab Name: Upstate Labs Inc. Contract: EMCON-GRAND ISLAND

Lab Code: 10170 Case No.: SAS No.: SDG No.: EMC13

Matrix Soil Lab Sample ID: 19796094

Sample wt.: 30 (g) Lab File ID: PA2926

% Moisture: 3 ~~2~~5 Decanted: NO Date Received: 7/15/96

Extraction: Son Dis Date Extracted: 7/17/96

Conc Extract Vol.: 10000 (uL) Date Analyzed: 7/25/96

Injection Vol.: 3 (uL) Time Analyzed: 10:59

GPC Cleanup: No pH: Dilution Factor 1

Instr. ID: ULI 9.0 Sulfur Cleanup: Yes

CAS NO.	COMPOUND	CONCENTRATION UNITS ug/Kg	Q
12674-11-2	Aroclor 1016	~~7.8~~ 8.9	U
11104-28-2	Aroclor 1221	~~7.8~~ 8.9	U
11141-16-5	Aroclor 1232	~~7.8~~ 8.9	U
53469-21-9	Aroclor 1242	~~7.8~~ 8.9	U
12672-29-6	Aroclor 1248	~~7.8~~ 8.9	U
11097-69-1	Aroclor 1254	~~7.8~~ 8.9	U
11096-82-5	Aroclor 1260	~~7.8~~ 8.9	U

BA 10/30/96

ENVIROFORMS/INORGANIC CLP

1
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
MW-205

Lab Name: Upstate Laboratories, Inc Contract:

Lab Code: 10170 Case No.: SAS No.: SDG No.: EMC12

Matrix (soil/water): SOIL Lab Sample ID: 19796094

Level (low/med): LOW Date Received: 07/15/96

% Solids: 75.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium				
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron				
7439-92-1	Lead	387		*	F
7439-95-4	Magnesium				
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium				
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium				
7440-28-0	Thallium				
7440-31-5	Tin				
7440-62-2	Vanadium				
7440-66-6	Zinc				
	Cyanide				

olor Before: BLACK Clarity Before: OPAQUE Texture: COARSE

olor After: YELLOW Clarity After: CLEAR Artifacts: YES

ents:
ONTAINED LARGE AND SMALL STONES.

FORM I - IN

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
PESTICIDE/PCB
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Leached	Date Extracted	Date Analyzed
20096037	Water	7/16/96	7/18/96	–	7/19/96	8/1/96
20096038	Water	7/16/96	7/18/96	–	7/19/96	8/1/96
20096039	Water	7/16/96	7/18/96	–	7/19/96	8/1/96
20096040	Water	7/16/96	7/18/96	–	7/19/96	8/1/96

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
INORGANIC ANALYSES

Laboratory Sample ID	Matrix	Parameters Requested	Date Rec'd at Lab	Date Analyzed
20096037	Water	Total & Dissolved Lead	7/18/96	8/8/96
20096038	Water	Total & Dissolved Lead	7/18/96	8/8/96
20096039	Water	Total & Dissolved Lead	7/18/96	8/8/96

Upstate Laboratories inc.

hipping: 6034 Corporate Dr. • E Syracuse, NY 13057-1017 • (315) 437-0255 • Fax (315) 437-1209
Mailing: Box 289 • Syracuse, NY 13206
Albany (518) 459-3134
Binghamton (607) 724-0478
Buffalo (716) 649-2533
Rochester (716) 436-9070
New Jersey (201) 703-1324

November 6, 1996

Ms. Judy Harry
Data Validation Services
P.O. Box 208
Cobble Creek Road
North Creek, New York 12853

Re: Wehran EMCON / GM Project
SDG EMC12, EMC13 & EMC15, ULI No. 25796010
Response to Data Validation Letter of 11-1-96

Dear Ms. Harry:

This letter is in response to your FAX of 11-1-96.

A. SDG EMC12-13

Item 1. Attached, please find the missing pages.

B. SDG EMC15

Item 1. Attached, please find corrected PCB "Forms I".

Item 2. Attached, please find the B-215 and B-217 Forms.

Should further questions arise, please feel free to contact me.

Sincerely,

UPSTATE LABORATORIES, INC.

A. Robert Martin
Manager

cc: Kathy Galanti, EMCON, letter only
A. Scala, ULI, letter only

FILE: M103196A

NY Lab ID 10170 NJ Lab ID 73750 PA Lab ID 68375

1A
PCB ANALYSIS DATA SHEET

NYSDEC SAMPLE NO. ~~EMCO 257-010~~ MW-207, S-3

Lab Name: Upstate Labs Inc.
Contract: EMCON
Lab Code: 10170
Case No.:
SAS No.:
SDG No.: EMC15
Matrix Soil
Lab Sample ID: EMCO 257-010
Sample wt.: 30 (g)
Lab File ID: PA3069
% Moisture: 11
Decanted: NO
Date Received:
Extraction: Son Dis
Date Extracted: 9/16/96
Conc Extract Vol.: 10000 (uL)
Date Analyzed: 9/24/96
Injection Vol.: 3 (uL)
Time Analyzed: 16:09
GPC Cleanup: No
pH:
Dilution Factor 1
Instr. ID: ULI 9.0
Sulfur Cleanup: Yes

CAS NO.	COMPOUND	CONCENTRATION UNITS ug/Kg	Q
12674-11-2	Aroclor 1016	7.5	U
11104-28-2	Aroclor 1221	7.5	U
11141-16-5	Aroclor 1232	7.5	U
53469-21-9	Aroclor 1242	7.5	U
12672-29-6	Aroclor 1248	7.5	U
11097-69-1	Aroclor 1254	7.5	U
11096-82-5	Aroclor 1260	7.5	U

1A
PCB ANALYSIS DATA SHEET

MW-207e
NYSDEC SAMPLE NO. ~~EMCO 257-011~~

Lab Name: Upstate Labs Inc. Contract: EMCON

Lab Code: 10170 Case No.: SAS No.: SDG No.: EMC15

Matrix Water Lab Sample ID: EMCO 257-011

Sample wt.: 1000 (mL) Lab File ID: PA3073

% Moisture: N/A Decanted: NO Date Received:

Extraction: Sep Fun Date Extracted: 9/16/96

Conc Extract Vol.: 10000 (uL) Date Analyzed: 9/24/96

Injection Vol.: 3 (uL) Time Analyzed: 13:38

GPC Cleanup: No pH: Dilution Factor 1

Instr. ID: ULI 9.0 Sulfur Cleanup: Yes

CAS NO.	COMPOUND	CONCENTRATION UNITS ug/L	Q
12674-11-2	Aroclor 1016	.20	U
11104-28-2	Aroclor 1221	.20	U
11141-16-5	Aroclor 1232	.20	U
53469-21-9	Aroclor 1242	.20	U
12672-29-6	Aroclor 1248	.20	U
11097-69-1	Aroclor 1254	.20	U
11096-82-5	Aroclor 1260	.20	U

1A
PCB ANALYSIS DATA SHEET

NYSDEC SAMPLE NO. MW-414 2 ~~EMCO 257-012~~

Lab Name: Upstate Labs Inc. Contract: EMCON

Lab Code: 10170 Case No.: SAS No.: SDG No.: EMC15

Matrix Water Lab Sample ID: EMCO 257-012

Sample wt.: 1000 (mL) Lab File ID: PA3073

% Moisture: N/A Decanted: NO Date Received:

Extraction: Sep Fun Date Extracted: 9/16/96

Conc Extract Vol.: 10000 (uL) Date Analyzed: 9/24/96

Injection Vol.: 3 (uL) Time Analyzed: 13:57

GPC Cleanup: No pH: Dilution Factor 1

Instr. ID: ULI 9.0 Sulfur Cleanup: Yes

CAS NO.	COMPOUND	CONCENTRATION UNITS ug/L	Q
12674-11-2	Aroclor 1016	.20	U
11104-28-2	Aroclor 1221	.20	U
11141-16-5	Aroclor 1232	.20	U
53469-21-9	Aroclor 1242	.20	U
12672-29-6	Aroclor 1248	.20	U
11097-69-1	Aroclor 1254	.20	U
11096-82-5	Aroclor 1260	.20	U

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
INORGANIC ANALYSES

Laboratory Sample ID	Matrix	Parameters Requested	Date Rec'd at Lab	Date Analyzed
25796010	Soil	Total Lead		
25796011	Water	Total & Dissolved Lead	9/13/96	9/13/96
25796012	Water	Total Lead	9/13/96	9/13/96
			9/13/96	9/13/96

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
PESTICIDE/PCB
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Leached	Date Extracted	Date Analyzed
25796010	Soil	9/9/96	9/13/96	–	9/16/96	9/24/96
25796011	Water	9/11/96	9/13/96	–	9/16/96	9/24/96
25796012	Water	9/13/96	9/13/96	–	9/16/96	9/24/96

Data Validation Services

Cobble Creek Road P. O. Box 208
North Creek, N. Y. 12853
Phone 518-251-4429

July 19, 1996

Kathy Galanti
Wehran Emcon
1775 Baseline Rd. Ste 220
Grand Island, NY 14072

RE: Validation of General Motors Site Data Packages
Upstate SDG Nos. EMC10 and EMC11
Northeast Analytical Report of 4-22-96

Dear Ms. Galanti:

Review has been completed for the data packages SDGs EMC10 and EMC11 generated by Upstate Labs, pertaining to samples collected at the General Motors Site. Twelve samples were processed for total lead; eight of these and two others were analysed for PCBs. Matrix spikes/duplicates were processed for both parameters. Methodologies utilized are those of the 1991 NYSDEC ASP CLP. Two samples were processed for congener specific PCBs by Northeast Analytical.

Data validation was performed with guidance from the most current editions of the USEPA CLP National Functional Guidelines for Organic and Inorganic Data Review, and the EPA SOPs HW-2 and HW-6. The following items were reviewed:

* Data Completeness
* Custody Documentation
* Holding Times
* Surrogate Recoveries
* Matrix Spike Recoveries/Duplicate Correlations
* Preparation/Calibration Blanks
* Control Spike/Laboratory Control Samples
* Calibration Standards
* Instrument IDLs
* Method Compliance
* Sample Result Verification

Those items showing deficiencies are discussed in the following sections of this report. All others were found to be acceptable as outlined in the above-mentioned validation procedures, and as applicable for the methodology. Unless noted specifically in the following text, reported results are substantiated by the raw data, and generated in compliance with protocol requirements.

In summary, sample processing was primarily conducted with compliance to protocol requirements and with adherance to quality criteria. Exceptions include PCB standard retention times. Certain edits to, and qualification of, reported results are indicated. These issues are discussed in the following analytical sections.

Copies of laboratory case narratives are attached to this narrative, and should be reviewed in conjunction with this narrative. A compliancy chart and laboratory NYSDEC Sample Preparation and Analysis Summary Forms are also included with this report.

General

Soil/sediment samples SED-01, SED-02, SED-03, and MH-2 had very low solids content, at 5.4%, 5.5%, 2.9%, and 11%, respectively. With values this low, sample nonhomogeneity is suspected because of the likelihood that the sample aliquots analysed are not representative. The reported results for these four samples should therefore be considered grossly estimated, with borderline usability.

PCB-8080 Analyses

Please see the above discussion regarding solids content of four samples.

Sample surrogate recoveries were within recommended range, with the exception of the recoveries of TCX in samples SW-1, SW-2, and SW-3, which recovered low (39% to 58%). No qualification of sample results is recommended for surrogate recovery.

Samples MW203 and MW406 were reanalysed at client's request to verify reported PCB identifications. The reanalyses, which were still within holding time, are preferable to the intially reported results. However, it should be noted that the sample inidividual isomer responses do not match well with the standard responses. This is true for the Aroclor 1242 and Aroclor 1260 identifications, but most particularly with the 1242, with variances (in what would ideally be 1:1 ratios) of up to 1:25. Review of the samples' responses indicate that the presence of PCB isomers is very likely, but the identification of the Aroclor mixture(s) is extremely difficult due to sample interferences and possible weathering. Although the isomer correlations are poor, the laboratory was compliant in reporting the mixtures. The identification of the presence of Aroclor 1260 is reasonable (based upon detected peaks and isomer ratio correlation), but the identification of Aroclor 1242 should be considered tentative ("N" validation flag).

The samples reanalyses, of 4/19/96, were associated with standards for Aroclor 1260 which produced responses outside the required retention time windows. The standard run early in the sequence (9:19 am) was acceptable. That run later (6:09 pm) produced late elutions. The samples were run at about 4 pm. Aroclor 1260 was reported for the sample reanalyses. When the system is "out of control" in this manner, it makes specific peak identification difficult, especially in the cases where samples contain numerous extraneous peaks, as do these. The analyst used overlap tracings and pattern recognition to aid in identification of this analyte (it is noted that the tracings where labeled in reverse in some instances--results are unaffected).

No sample matrix spike or duplicate determinations were performed. Spiked blanks produced recoveries of Aroclor 1248 at 65% (aqueous) and 100% (soil).

Congener PCB Analyses

Analysis was performed for individual congener pattern identification, per a laboratory method MEA608CAP.

As noted in the data package, the reported identification of Aroclor 1248 in sample MW-203 should be considered tentative, due to matrix interference prohibiting conclusive identification.

Surrogate recoveries were acceptable. No accuracy and precision determinations were requested or performed.

Total Lead Analyses

Please see the above discussion regarding solids content of four samples.

Matrix spikes were performed on SW-2 (aqueous), BL-96-2 (soil), and MH-2 S-2(soil). All accuracy and precision values were acceptable except the duplicate precision for BL-96-2, which was 53%RPD. No qualification to sample reported results is indicated.

The reported lead contents of SW-1, SW-2, SW-3, and MH-2 S-2 are at levels similar to those in associated blanks, and lead should not be considered a sample constituent for these samples.

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,

Judy Harry

Judy Harry

COMPLIANCY CHART

Project: Wehran Emcon --GM SITE

SDG Nos. Upstate SDG Nos. EMC10 and EMC11

Protocol: EPA-8080 and 239.2 CLP-M

Rec. Date	Sample ID	Matrix	PCB	Pb	Noncompliancy
04-01-96	BL-96-2,S-2	Soil	NR	OK	
04-01-96	BL-96-6,S-2	Soil	NR	OK	
04-01-96	BL-96-7,S-2	Soil	NR	OK	
04-05-96	SED-1	Soil	OK	OK	
04-05-96	SED-2	Soil	OK	OK	
04-05-96	SED-3	Soil	OK	OK	
04-05-96	MH-2	Soil	OK	OK	
04-05-96	SW-1	Aqueous	OK	OK	
04-05-96	SW-2	Aqueous	OK	OK	
04-05-96	SW-3	Aqueous	OK	OK	
04-05-96	MH-2	Aqueous	OK	OK	
04-05-96	MW-203	Aqueous	NO	NR	1
04-05-96	MW-406	Aqueous	NO	NR	1
		Aqueous			
04-05-96	BL-96-8	Soil	OK	NR	
04-05-96	MW203	Aqueous	OK	NR	

1. Aroclor 1260 standard retention times outside allowable window

Narrative

1.0 Summary

This report presents the laboratory test results for fourteen water/soil/sediment samples collected from Buffalo, New York. The samples were analyzed for Total Lead & Polychlorinated Biphenyls.

This report is divided into two packages. The Sample Data Summary Package (Volume 1) presents a summary of the test results and quality control data. This abbreviated format is useful to engineers and environmental scientists. The Sample Data Package (Volumes 2-4) is a comprehensive report containing instrument raw data. It is formatted for validation by an independent third party.

2.0 Chain of Custody

The samples were collected by Wehran EMCON on March 28, April 3 and 4, 1996 and hand delivered to Upstate Laboratories, Inc., Syracuse, New York. The Chain of Custody documentation is copied in Volumes 1 & 2.

3.0 Methodology

The analyses were performed using test methods developed by the U.S. Environmental Protection Agency (EPA) under RCRA and reorganized by the New York State Department of Environmental Conservation (NYSDEC) into the Analytical Services Protocol (ASP). The specific method numbers are:

Parameter	Method
PCBs	8080
Pb	239.2 CLP-M

"Analytical Services Protocol", New York State Department of Environmental Protection, 12/91 revision.

4.0 Internal Validation

The following observations are offered.

<u>Holding Time</u> : All criteria were satisfied following the NYSDEC ASP, revision 1991.

<u>Trace Metals</u>

Calibration : All criteria were satisfied.

Method Blanks : All criteria were satisfied.

Reference Samples : All criteria were satisfied.

Matrix Spike : Although not designated on Chain of Custody, matrix spikes were performed on both water & sediment matrices. A high % recovery in the soil

MS soil is attributed to the matrix of the sample.

Duplicates : The %RSD was high for the soil sample BL96-2D. A large dilution contributed to lower precision.

PCBs

Calibration : All criteria were satisfied.

Method Blanks : All criteria were satisfied.

Reference Samples : All criteria were satisfied.

Matrix Spike : No MS were performed due to insufficient sample volume and no site specific MS was designated on the Chain of Custody Record.

Surrogates : TCX was outside of contract limits for samples SW-1, SW-2, & SW-3.

Note : MW-406 & MW-203 were treated a second time for sulfur interference and re-analyzed.

Note : Samples SED-1, SED-2, & SED-3 were called sludge, soil, & sediment in different places in the text. They are sediment matrices.

Note : Sample BL-96-1, S-3 was extracted and placed on hold per Chain of Custody Record.

Approved

Anthony J. Scala, Director

Narrative

1.0 Summary

This report presents the laboratory test results for one water sample collected from Buffalo, New York. The sample was analyzed for Total Lead.

This report is divided into two packages. The Sample Data Summary Package (Volume 1) presents a summary of the test results and quality control data. This abbreviated format is useful to engineers and environmental scientists. The Sample Data Package (Volume 2) is a comprehensive report containing instrument raw data. It is formatted for validation by an independent third party.

2.0 Chain of Custody

The samples were collected by EMCON on May 21, 1996 and hand delivered to Upstate Laboratories, Inc., Syracuse, New York. The Chain of Custody documentation is copied in Volumes 1 & 2.

3.0 Methodology

The analyses were performed using test methods developed by the U.S. Environmental Protection Agency (EPA) under RCRA and reorganized by the New York State Department of Environmental Conservation (NYSDEC) into the Analytical Services Protocol (ASP). The specific method number is:

Parameter	Method
Pb	239.2 CLP-M

"Analytical Services Protocol", New York State Department of Environmental Protection, 12/91 revision.

4.0 Internal Validation

The following observations are offered.

Holding Time	: All criteria were satisfied following the NYSDEC ASP, revision 1991.
Calibration	: All criteria were satisfied.
Method Blanks	: All criteria were satisfied.
Reference Samples	: All criteria were satisfied.
Matrix Spike	: Although not designated on Chain of Custody, a matrix spike was performed on the sample.
Duplicates	: Although not designated on Chain of Custody, a duplicate was performed on the sample.

Approved

Anthony J. Scala, Director

CASE NARRATIVE

LAB NAME: NORTHEAST ANALYTICAL, INC.

LAB CODE: NYS ELAP #11078

NUMBER OF SAMPLES : 2

DATE SAMPLES RECEIVED : 4/5/96

NUMBER OF QA/QC SAMPLES : 5

LAB METHOD : NEA608CAP

QA/QC, SAMPLE, SHIPMENT, ANALYTICAL COMMENTS:

① Samples were shipped to Lab and arrived in good condition
② All samples were extracted within prescribed hold time
③ All samples were analyzed within prescribed hold time
④ No problems were encountered during sample extraction

TECHNICAL AND ADMINISTRATIVE COMMENTS:

① All QC samples met stated limits
② No problems were encountered during sample analysis.
③ Sample MW-203 had many (Approx. 100) non-PCB analytes that responded on ECD, with several that co-eluted with PCB target peaks. Only a tentatively identification of A1248 can be made for this sample
(over)

LAB MANAGER: R.E. Wagner **DATE:** 4/22/96

CASE NARRATIVE

LAB NAME: NORTHEAST ANALYTICAL, INC.

LAB CODE: NYS ELAP #11078

NUMBER OF SAMPLES :__________

DATE SAMPLES RECEIVED :__________

NUMBER OF QA/QC SAMPLES :__________

LAB METHOD :__________

QA/QC, SAMPLE, SHIPMENT, ANALYTICAL COMMENTS:

TECHNICAL AND ADMINISTRATIVE COMMENTS:

③ (cont.) The following identified PCB peaks should be considered tentatively identified and could be biased high: 14, 22, 31, 37, 45, 46, 52, 54, 56, 57, 60, 63, 67, 73, 79, 80, 83, 84, 85, 89, 92, 100, 103.

LAB MANAGER: R.E. Wag **DATE:** 4/22/96

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		VOA GC/MS Method #	BNA GC/MS Method #	VOA GC Method #	PCBs Method #	Metals	Other
S-2	09296037	-	-	-	-	Total Pb	% Solids
S-2	09296038	-	-	-	-	Total Pb	% Solids
S-2	09296039	-	-	-	-	Total Pb	% Solids
S-3	09296040	-	-	-	-	ON HOLD	–
SED-1	09696094	-	-	-	8080	Total Pb	% Solids
SED-2	09696095	-	-	-	8080	Total Pb	% Solids
SED-3	09696096	-	-	-	8080	Total Pb	% Solids
MH-2	09696097	-	-	-	8080	Total Pb	% Solids
SW-1	09696098	-	-	-	8080	Total Pb	–
SW-2	09696099	-	-	-	8080	Total Pb	–
SW-3	09696100	-	-	-	8080	Total Pb	–
MH-2	09696101	-	-	-	8080	Total Pb	–
MW-203	09696102	-	-	-	8080	–	–
MW-406	09696103	-	-	-	8080	–	–

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		VOA GC/MS Method #	BNA GC/MS Method #	VOA GC Method #	Pest PCBs Method #	Metals	Other
MH-2, S-2	14396058	–	–	–	–	Total Lead	–

Data Validation Services
Cobble Creek Road P. O. Box 208
North Creek, N. Y. 12853
Phone 518-251-4429

August 31, 1995

Kathy Galanti
Wehran Emcon
1775 Baseline Rd. Ste 220
Grand Island, NY 14072

RE: Validation of General Motors Site Data Packages
Upstate SDG Nos. EMC01 through EMC07 and EMC09

Dear Ms. Galanti:

Review has been completed for the data packages generated by Upstate Labs, pertaining to samples collected at the General Motors Site. Soil and aqueous samples were processed for total lead and/or PCB parameters. Some of these were analysed for TCLP lead. Field blanks and matrix spikes/duplicates were processed for all parameters. Methodologies utilized are those of the 1991 NYSDEC ASP CLP.

Data validation was performed in accordance with the the most current editions of the USEPA CLP National Functional Guidelines for Organic and Inorganic Data Review. The following items were reviewed:

- Data Completeness
- Custody Documentation
- Holding Times
- Surrogate Recoveries
- Matrix Spike Recoveries/Duplicate Correlations
- Preparation/Calibration Blanks
- Control Spike/Laboratory Control Samples
- Calibration Standards
- Instrument IDLs
- Method Compliance
- Sample Result Verification

Those items showing deficiencies are discussed in the following sections of this report. All others were found to be acceptable as outlined in the above-mentioned validation procedures, and as applicable for the methodology. Unless noted specifically in the following text, reported results are substantiated by the raw data, and generated in compliance with protocol requirements.

In summary, sample processing for lead was primarily conducted with compliance to protocol requirements and with adherance to quality criteria. PCB processing included numerous outlying standard responses. Certain edits to, and qualification of, reported results are indicated. These issues are discussed in the following analytical sections.

Copies of laboratory case narratives are attached to this narrative, and should be reviewed in conjunction with this narrative. A compliancy chart and laboratory NYSDEC Sample Preparation and Analysis Summary Forms are also included with this report.

Data Completeness

Resubmissions include corrections to sample reported results and previously omitted raw data.

Sample Custody/Condition at Receipt

Certain of the sample shipments were received with cooler temperatures as high as 21 degrees Centigrade. Others were not packed on ice, but were received by the laboratory the same day as they were collected. Some samples were held up to five days before shipment (see resubmission communications). Because the project analytes (total lead and PCB) are not susceptible to degradation at these conditions, no impact on sample reported results is indicated.

PCB Analyses

Please see resubmission communications regarding corrections to sample reported results. They are as follows:

Sample ID	Aroclor	Actual Value
NWT-E2	1248	27 ug/kg
NWT-B2	1248	27,000
SE-E3	1248	180,000
SET-A1	1260	170

Those sample surrogates which were not diluted beyond evaluation, or elevated by interferences, were acceptable.

Aqueous matrix spike blanks (MSBs) of Aroclor 1248 were acceptable, with values from 62% to 140%. Sample matrix spike recoveries for MW297 and for nonproject samples were acceptable (55% to 97%). The duplicate correlation for the matrix spikes of MW297 was high, at 46%RPD (recommended limit is 20%RPD).

Soil MSB data for the IRM/Saginaw delivery group are unavailable due to spiking error; those for the IRM SDG are acceptable. Soil sample matrix spike results for MH-1 and NWT-B2 are not useful for evaluation because of the sample concentration relative to the spike concentration (sample results are about 30 times and 500 times the spike amount added, respectively).

Although initial calibration standards are performed at levels as low as the sample reported detection limits, the daily calibration standards are analysed at 20 times the reported detection limits, which is too high to provide confidence in detection of low levels on a given day. Therefore all project sample reported detection limits for nondetected PCBs should be considered estimated.

The detection limit for Aroclor 1016 in sample SE-E3 should be additionally considered as estimated due to interference from the elevated level of Aroclor 1248 in the sample.

The daily calibration standards associated with the IRM/Saginaw SDG produced noncompliant outlying correlations for all detected Aroclor mixtures (many were above 30% Difference, and as high as 71%Difference; above the required 20%Difference limit from the expected response). The laboratory should have made corrective action and repeated the sample analyses under compliant conditions. The responses were elevated above those expected. All sample analyses in the IRM/Saginaw SDG were associated with outlying standards, and therefore all those sample detected PCB values should be considered estimated. Although certain of the standards associated with samples in the IRM SDG were noncompliant with elevated responses, those analytes were not detected in the samples, and reported results for those samples in that SDG are unaffected.

The unacceptable system conditions of SDG IRM/Saginaw are additionally indicated by the variance in the quantitative values between the two columns. Most detected PCB results, including those in spiked blanks, showed about 30 to 40% difference in values obtained on the two columns (this is shown by the "P" flag).

All reported Aroclor values with the "P" flag should be considered estimated The Aroclor 1260 result for MH-1 should have been flagged as "P" (the dual column percent difference in 30%D).

Identification of specific Aroclor mixtures is often difficult due to interferences and weathering, which can alter the relative ratio of individual isomers. Often the best match to a standard is reported, although a good match is not possible. Review of the relative response of the isomers, as compared to standards, was done during validation. The ideal ratios would be 1:1 for all isomers. Some samples produced ratios of more than 1:10, and identification becomes questionable. Due to poor individual isomer correlation, the following Aroclor mixture identifications should be considered tentative:

Sample ID	Aroclor
MH-1	1248
MW-203	1242

Samples NW-C3, NWT-B2, NWT-E2, and SE-E3 showed extremely high levels of PCBs (requiring dilutions of 500 to 1000). The solvency of the extraction may have been exceeded, and the reported results should be considered estimated, possibly biased low.

Sample Forms 1 should show extract volumes, injection volumes, etc.
Surrogate Forms 2 should flag outlying values.
Matrix spike Forms 3 should report as dry weight, and should flag outlying values.
Blank Forms 4 should include a listing of the matrix spikes extracted with the samples.
Forms 10B should have been provided for matrix spike blanks.

Total Lead Analyses

Samples BL-95-13-S2 and BL-95-26-S2 were initially analysed in SDG EMC02, and reanalysed and reported in SDG EMC07. Determined values were significantly different. BL-95-13-S2 was 897 and 3680 ppm; BL-95-26-S2 was 12,300 and 2710 ppm. The reason for this variance is likely sample nonhomogeneity, and the sample results should be considered grossly estimated. The implication of this variance as relates to all project samples should be considered during the usability evaluation of the project data. Sample results should be used with caution.

The dissolved fraction of MW-1 produced detectable levels of lead (4.4 ug/L); none was detected in the unfiltered fraction. Therefore the lead result for both fractions of this sample should be rejected.

Matrix spikes were performed on TP1-AA, BL-95-13-S2, RW-95-1-S3, BL-95-8-S2, BL-95-12-S1, MW200-S2, BL-95-12-S2, MH-2, and MW204-T. The following spike outliers were observed. The reported results of all samples in the same SDGs as the spikes showing depressed recovery of lead should be considered estimated. The detected reported results for all samples in the same SDGs as the spikes showing elevated recovery of lead should be considered estimated (nondetected results are unaffected by elevated recoveries).

SDG No.	Sample Spiked	Recovery
EMC01*	TP1-AA	179%
EMC03	RW-95-1-S3	53%
EMC04**	BL-95-12-S1	-5.5% by ICP (OK by furnace) (only samples with "P" method qualified).
EMC06	MW204-T	128%

*This recovery would have been 99% if calculated against the duplicate sample, indicating possible sample nonhomogeneity.

**This recovery would have been 94% if calculated against the duplicate sample, indicating possible sample nonhomogeneity.

Due to outlying spike recovery, all samples processed by ICP ("P" method) in SDG EMC04 should have been flagged as "N" by the laboratory.

Duplicate correlations which are outside recommended limits are as follows:

SDG No.	Sample ID	Duplicate Correlation
EMC01	TP1-AA	32 %RPD
EMC02	BL-95-8-S2	58%RPD by ICP, 52%RPD by furnace
EMC03	RW-95-1-S3	44%RPD
EMC04	BL-95-12-S1	91%RPD

No qualification to sample reported results is indicated by these correlations.

The equipment blanks associated with SDGs EMC01 and EMC04 produced detectable levels of ead, but all sample values are greater than ten times the blank level, and there is no effect on sample reported results.

Sample BL-95-4-S3 produced a low post-digest spike recovery, at 73.3% (below limit of 85%). The sample should have therefore been processed by Method of Standard Addition (MSA); the reported result should be considered estimated.

Sample MW200D produced low (83%) post-digest spike recovery, and the reported result should be considered estimated due to possible matrix interference.

The "M" flags for samples in EMC06 should be removed (they are not applicable).

Samples BL-95-16-S2, BL-95-16-S3, MW200S2 were processed by ICP, although the levels were not sufficiently high for the methodology (greater than five times the ICP IDL at the instrument level). The reported results for these samples should be considered estimated.

Due to elevated recovery of the CRIs (standards spiked at two times CRDL), 142% and 129% (above advisory limit of 120%), the reported result for RW-95-1-S3 should be considered estimated. In addition, this sample value was not sufficiently high a concentration (five times the IDL) to be run by ICP.

Due to elevated recovery of the CRIs (standards spiked at two times CRDL), 130% and 137% (above advisory limit of 120%), the reported results for BL-95-10-S3, BL-95-1-S2, BL-95-4-S3, BL-3-S2, and BL-3-S3 should be considered estimated.

Serial dilution determinations for 95-26-S2, BL-95-9-S3, and BL-95-6-S2 produced acceptable correlation.

No aqueous Laboratory Control Samples and preparation blank were done for association with the equipment blanks. The aqueous samples were digested with the soils.

No Form 2B for the CRI analyses in EMC05 or EMC06 were provided. Review of the raw data shows good recovery (93% and 83%).

TCLP Lead

Matrix spikes and duplicates were performed on the TCLP extracts of samples BL-95-8-S2 and BL-95-22-S2. Accuracy and precision results were acceptable, with the exception of the spike recovery of BL-95-22-S2, which was performed by ICP, and only 58%. Therefore the lead values in the TCLP extracts which were analysed by ICP ("P" method) should be considered estimated.

ICP serial dilution of BL-95-11-S2 was acceptable.

No leachate blank was reported, and none appears on the digestion log as being digested with the sample leachates. Therefore any contamination that may have been introduced during the leaching process is not evaluated. Sample leachate results should be viewed with this fact in mind.

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,

Judy H

Judy Harry

COMPLIANCY CHART

Project: Wehran-Emcon General Motors

SDG Nos. Upstate SDGs. EMC01, EMC02, EMC03, EMC04, EMC05, EMC06, EMC07, and EMC09

Protocol: SW846

Rec. Date	Sample ID	Matrix	Pb	PCB	Noncompliancy
03-24-95	TP-1AA	Soil	OK	NR	
03-24-95	TP-1A	Soil	OK	NR	
03-24-95	TP-2AA	Soil	OK	NR	
03-24-95	TP-2A	Soil	OK	NR	
03-24-95	EquipBlk 1	Aqueous	NO	NR	1
03-27-95	SET-D1	Soil	OK	NR	
03-27-95	NWT-D2	Soil	OK	NR	
03-27-95	SET-B2	Soil	OK	NR	
03-27-95	NWT-A1	Soil	OK	NR	
03-28-95	BL-95-8-S2	Soil	OK	NR	
03-28-95	BL-95-8-S3	Soil	OK	NR	
03-28-95	BL-95-7-S2	Soil	OK	NR	
03-28-95	BL-95-7-S3	Soil	OK	NR	
03-28-95	BL-95-5-S2	Soil	OK	NR	
03-28-95	BL-95-5-S3	Soil	OK	NR	
03-28-95	BL-95-6-S2	Soil	OK	NR	
03-28-95	BL-95-6-S3	Soil	OK	NR	
03-28-95	BL-95-13-S4	Soil	OK	NR	
03-28-95	BL-95-13-S2	Soil	OK	NR	
03-28-95	BL-95-16-S2	Soil	NO	NR	2
03-28-95	BL-95-16-S3	Soil	NO	NR	2
03-28-95	BL-95-26-S2	Soil	OK	NR	
03-28-95	BL-95-13(S2)	Soil	OK	NR	
03-28-95	BL-95-26(S2)	Soil	OK	NR	
03-29-95	RW-95-1 S3	Soil	NO	NR	2
03-29-95	BL-95-9 S2	Soil	OK	NR	
03-29-95	BL-95-9 S3	Soil	OK	NR	
03-29-95	BL-95-14 S1	Soil	OK	NR	
03-29-95	MW-201 S2	Soil	OK	NR	
03-29-95	MW-201 S3	Soil	OK	NR	
03-31-95	BL-95-3 S2	Soil	OK	NR	
03-31-95	BL-95-3 S3	Soil	OK	NR	
03-31-95	MW-200 S2	Soil	NO	NR	2

Rec. Date	Sample ID	Matrix	Pb	PCB	Noncompliancy
03-31-95	MW-200 S3	Soil	OK	NR	
03-31-95	BL-95-2 S2	Soil	OK	NR	
03-31-95	BL-95-2 S1	Soil	OK	NR	
03-31-95	BL-95-4 S2	Soil	OK	NR	
03-31-95	BL-95-4 S3	Soil	NO	NR	3
03-31-95	MW-299 S3	Soil	OK	NR	
03-31-95	BL-95-15 S1	Soil	OK	NR	
03-31-95	MW-204 S3	Soil	OK	NR	
03-31-95	MW-298 S3	Soil	OK	NR	
03-31-95	BL-95-12 S1	Soil	OK	NR	
03-31-95	BL-95-12 S2	Soil	OK	NR	
03-31-95	BL-95-14 S2	Soil	OK	NR	
03-31-95	BL-95-15 S2	Soil	OK	NR	
03-31-95	BL-95-10 S2	Soil	OK	NO	5
03-31-95	BL-95-10 S3	Soil	OK	NO	5
03-31-95	BL-95-11 S1	Soil	OK	NR	
03-31-95	BL-95-11 S2	Soil	OK	NR	
03-31-95	BL-95-1 S1	Soil	OK	NR	
03-31-95	BL-95-1 S2	Soil	OK	NO	5
03-31-95	MW-204 S2	Soil	OK	NO	5
03-31-95	BL-95-22 S2	Soil	OK	NR	
03-31-95	BL-95-20 S2	Soil	OK	NO	5
03-31-95	RW-95-1 S2	Soil	OK	NR	
03-31-95	Equip.Blk 2	Aqueous	NO	NO	1,5
03-31-95	Equip.Blk 3	Aqueous	NO	NO	1,5
04-12-95	MH-2	Aqueous	OK	NO	5
04-20-95	EBT	Aqueous	OK	NR	
04-21-95	MW-1	Aqueous	OK	NR	
04-20-95	MW-5	Aqueous	OK	NR	
04-21-95	MW-200	Aqueous	OK	NR	
04-21-95	MW-201	Aqueous	OK	NR	
04-21-95	MW-202	Aqueous	OK	NR	
04-20-95	MW-203	Aqueous	OK	NR	
04-20-95	MW-204	Aqueous	OK	NR	
04-20-95	MW-404	Aqueous	OK	NR	
04-20-95	MW-408	Aqueous	OK	NR	
04-20-95	RW951	Aqueous	OK	NR	
03-27-95	SET-A1	S oil	NR	NO	5
03-27-95	NWT E2	Soil	NR	NO	5
03-27-95	NWT-B2	Soil	NR	NO	5
03-28-95	NW-C3	Soil	NR	NO	5
03-28-95	SE-C3	Soil	NR	NO	5

Rec. Date	Sample ID	Matrix	Pb	PCB	Noncompliancy
03-28-95	SE-C2	Soil	NR	NO	5
03-31-95	RW 95 1	Soil	NR	NO	5
03-31-95	BL-95-2	Soil	NR	NO	5
03-31-95	BL-95-3	Soil	NR	NO	5
03-31-95	MW 200	Soil	NR	NO	5
03-31-95	BL-95-4	Soil	NR	NO	5
03-31-95	BL-95-12	Soil	NR	NO	5
03-31-95	MW=297	Soil	NR	NO	5
04-12-95	MH-1	Soil	NR	NO	5
04-12-95	MH-2	Soil	NR	NO	5
04-20-95	MW-1	Aqueous	NR	NO	5
04-20-95	MW-5	Aqueous	NR	NO	5
04-20-95	MW-200	Aqueous	NR	NO	5
04-20-95	MW-201	Aqueous	NR	NO	5
04-20-95	MW-202	Aqueous	NR	NO	5
04-20-95	MW-203	Aqueous	NR	NO	5
04-20-95	MW-204	Aqueous	NR	NO	5
04-21-95	RW-95-1	Aqueous	NR	NO	5
04-21-95	RW-95-2	Aqueous	NR	NO	5

Rec. Date	Sample ID	Matrix	TCLP Pb	Noncompliancy
07-28-95	BL-95-8-S2	Soil	NO	4
07-28-95	BL-95-6-S3	Soil	NO	4
07-28-95	BL-95-26-S2	Soil	NO	4
07-29-95	BL-95-9-S3	Soil	NO	4
07-31-95	BL-95-11-S2	Soil	NO	4
07-31-95	BL-95-22-S2	Soil	NO	4
07-28-95	BL-95-8-S2	Soil	NO	4

1. No aqueous preparation blank or LCS performed.
2. Analysis should be performed by furnace, no ICP.
3. Sample analysis should have been performed by MSA.
4. No TCLP leachate blank processed with samples.
5. PCB standards with outlying responses.

Data Validation Services

Cobble Creek Road P. O. Box 208
North Creek, NY 12853
Phone and Fax (518) 251-4429

Facsimile Transmission

TO: Wendy Wagner

COMPANY: Upstate Labs

FAX NUMBER: 315 437-1209

FROM: Judy Harry

DATE: 7-25-95

No. of pages, including cover: 1

Review is in progress for Emcon data packages pertaining to the GM IRM project. Prior to completion of the validation report, the raw data associated with the moisture/solids determinations is needed for review. Please forward the moisture/solids data associated with all project soil samples, so that the solids content incorporated into reported results can be verified.

Please copy Kathy Galanti at Emcon with all communications. Thank you for your prompt attention to this matter.

Data Validation Services

Cobble Creek Road P. O. Box 208
North Creek, NY 12853
Phone and Fax (518) 251-4429

Facsimile Transmission

TO: Wendy Wagner 9.

COMPANY: Upstate Labs

FAX NUMBER: 315 437-1209

FROM: Judy Harry

DATE: 8-7-95

No. of pages (including cover): 1

I received the solids raw data for the Wehran Emcon GM project, which you shipped to me last week. Thank you. The raw data for the samples in SDG EMCO1 were not with the submitted documentation. Please forward a copy for review.

In addition, please also address the following issues:

Regarding the PCB data for the GM IRM/Saginaw package, it is observed on the extraction logs that soil sample matrix spikes (on MH-1) and soil MSBs were processed with the soil samples. However, no summary or raw data pertaining to soil spike recoveries/duplicate correlation is provided in that package. Please provide summary Forms 3, 1, and 10, and appropriate raw data for the soil accuracy and precision data that accompanied the sample processing.

Similarly, although the extraction log shows that (non-project) aqueous sample matrix spikes were prepared with the project samples in that same SDG, no summary/raw data were provided to show sample accuracy and precision. Please provide.

Evaluation of the PCB data for NWT-E2 (SDG GM/IRM) shows responses which warrent a reportable level of Aroclor 1248. Please re-review this sample and comment.

Please confirm that the reported PCB results for NWT-B2, SE-E3, and SET-A1 contain transcription errors (of one to three significant figures).

Thank you for prompt attention to this matter. Please also copy Kathy Galanti at Emcon with all communications.

Data Validation Services

Cobble Creek Road P. O. Box 208
North Creek, NY 12853
Phone and Fax (518) 251-4429

Facsimile Transmission

TO: Wendy Wagner

COMPANY: Upstate Labs

FAX NUMBER: 315 437-1209

FROM: Judy Harry

DATE: 8-21-95

No. of pages (including cover): 1

COMMENTS: RE: Emcon GC Project

Thank you for your response to my previous resubmission request. In addition to the information provided, it is appropriate for the lab to issue a Form 1 and Form 10B reflecting the change to the reported results for NWT-E2. This allows for review of determined values (Form 10B) and complete documentation for the data package (Forms 1 and 10B). Corrected Forms 1 for the three samples NWT-B2, SE-E3, and SET-A1 should also be provided. Please forward these to myself and Kathy Galanti at our earliest convenience.

Thanks,

J.

Upstate Laboratories inc.

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July 31, 1995

Judy Harry
Data Validation Services
Cobble Creek Rd.
P.O. Box 208
North Creek, NY 12853

Re: EMCON - GM/IRM Project

Dear Judy:

Per your FAX, to Wendy Wagner on 7/25/95, please find enclosed the % solids data required to complete your validation. The following is a cross-reference table of ULI and client ID numbers.

ULI ID	Client ID
08695001	SET-A1
08695002	NWT-E2
08695003	SET-D1
08695004	NWT-D2
695005	NWT-B2
695006	SET-B2
08695007	NWT-A1
08795001	NW-C3
08795002	SE-E3
08795003	SE-C2
08795004	BL-95-8 S2
08795005	BL-95-8 S3
08795006	BL-95-7 S2
08795007	BL-95-7 S3
08795008	BL-95-5 S2
08795009	BL-95-5 S3
08795010	BL-95-6 S2
08795011	BL-95-6 S3
08795012	BL-95-13 S4
08795013	BL-95-13 S2
08795014	BL-95-16 S2
08795015	BL-95-16 S3
08795016	BL-95-26 S2
08895018	RW-95-1 S3
08895019	BL-95-9 S2
08895020	BL-95-9 S3
08895021	BL-95-14 S1
08895022	MW-201 S2
08895023	MW-201 S3
09095007	BL-95-3 S2
09095008	BL-95-3 S3
09095009	MW-200 S2
09095010	MW-200 S3
09095011	BL-95-2 S2
09095012	BL-95-2 S1
09095013	BL-95-4 S2
09095014	BL-95-4 S3
09095015	MW-299 S3
09095018	RW-95-1 S3
09095019	BL-95-2 S2
09095020	BL-95-3 S2
09095021	MW-200 S2
09095022	BL-95-4 S2
09095023	BL-95-12 S3
09095024	BL-95-15 S1
09095025	MW-204 S3
09095026	MW-298 S3
09095118	BL-95-1 S1
09095119	BL-95-12 S2
09095120	BL-95-14 S2
09095121	BL-95-15 S2
09095122	BL-95-10 S2
09095123	BL-95-10 S3
09095124	BL-95-11 S1
09095125	BL-95-11 S2
09095126	BL-95-1 S1
09095127	BL-95-1 S2
09095128	MW-204 S2
09095131	BL-95-22 S2
09095132	BL-95-20 S2
09095133	MW-297 S2
09095157	RW-95-1 S2
10295009	MH-1
10295011	MH-2

Should you have any questions, please feel free to give me a call.

Sincerely,

UPSTATE LABORATORIES, INC.

Brian S Brundidge

Brian S. Brundidge
Quality Control Division

BSB
cc: Wendy Wagner, file
BSB/B073195A

Upstate Laboratories inc.

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August 16, 1995

Ms. Judy Harry
Data Validation Services
P.O. Box 208
Cobble Creek Road
North Creek, New York 12853

Re: Wehran EMCON GM Project
Data Validation

Dear Ms. Harry:

This letter is in response to your FAX of 8-7-95.

In Attachment 1, please find the percent solid data for SDG EMC01.

In Attachment 2, please find the MS/MSD and MSB information you requested. As stated in the case narrative, recovery data could not be calculated for the MSB because the analyst forgot to spike PCB into the MSB. Also, recovery data could not be calculated for the MS and MSD because the sample had high concentration of background PCB.

In Attachment 3, please find non-project specific QC data and raw data for water samples.

Responding to your evaluation of NWT-E2 (SDG GM/IRM), we concur with your conclusion that reportable levels of PCB are present in this sample. An error was made in the laboratory and a positive value for Aroclor 1248 should have been reported as follows:

Site	ULI ID. No.	ug/kg d.w.	Aroclor
NWT-E2	08695002	27	Aroclor 1248

Your observation that the PCB values reported for NWT-B2, SE-E3 and SET-A1 are slightly different from the raw data is also correct. The analyst transcribed values from the Turbochrom report which were calculated from a response factor using the sum of area counts rather a response factor for each individual area count. The values that should be reported are:

Site	ULI ID. No.	ug/kg d.w	Aroclor
NWT-B2	08695005	27,000.	Aroclor 1248
SE-E3	08695002	180,000.	Aroclor 1248
SET-A1	08695001	170.	Aroclor 1260

Please let us know if you require an amended report in addition to this letter. Should further questions arise, please feel free to contact me.

Sincerely,

UPSTATE LABORATORIES, INC.

A. Robert Martin
Manager

cc: Kathy Galanti, EMCON, letter only
A. Scala, ULI, letter only
D. Pastuf, letter only

ARM/M081595A

3E1/3F1
PESTICIDE MATRIX SPIKE BLANK (REFERENCE SAMPLE) RECOVERY

Lab Name: Upstate Laboratories, Inc. Contract: EMCON – General Motors

Lab Code: 10170 Case No.: – SAS No.: – SDG No.: –

Matrix Spike – NYSDEC Sample No.: PA1659RS

COMPOUND	SPIKE ADDED	MSB CONC.	MS % REC #	QC (1) LIMITS REC.
Aroclor 1016	–	–	–	50–114
Aroclor 1221	–	–	–	15–178
Aroclor 1232	–	–	–	10–215
Aroclor 1242	–	–	–	39–150
Aroclor 1248	0.0	0.0	0	38–158
Aroclor 1254	–	–	–	29–131
Aroclor 1260	–	–	–	8–127

(1) Method 8080, Table 3

\# Column to be used to flag recovery and RPD values with an asterisk

Spike Recovery: 0 out of 1 outside limits

COMMENTS:

For ULI use only:
Record No.: B052595A

3E/3F
PESTICIDE MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Name: Upstate Laboratories, Inc. Contract: EMCON – General Motors

Lab Code: 10170 Case No.: – SAS No.: – SDG No.: –

Matrix Spike – NYSDEC Sample No.: MH-1 (ULI ID 10295009)

COMPOUND	SPIKE ADDED	SAMPLE CONC.	MS CONC.	MS % REC #	MSD CONC.	MSD % REC #	% RPD	QC (2) RPD LIMITS	QC (1) LIMITS REC.
roclor 1016	–	–	–	–	–	–	–	20	50–114
roclor 1221	–	–	–	–	–	–	–	20	15–178
roclor 1232	–	–	–	–	–	–	–	20	10–215
roclor 1242	–	–	–	–	–	–	–	20	39–150
roclor 1248	33.0	940	710.0	*	580.0	*	*	20	38–158
roclor 1254	–	–	–	–	–	–	–	20	29–131
roclor 1260	–	–	–	–	–	–	–	20	8–127

* MS/MSD samples for MH-1 were not recoverable because of high PCB concentrations

(1) Method 8080, Table 3
(2) ULI In-house control limits
\# Column to be used to flag recovery and RPD values with an asterisk

RPD: * out of 1 outside limits

Spike Recovery: * out of 2 outside limits

COMMENTS:

For ULI use only:
Record No.: B052595A

FORM III – CLP – PEST

PCB

UPSTATE LABORATORIES, INC.
MATRIX SPIKE FORM

QC Group Number PA1612

EPA Methods 608 and 8080 ULI S60-0-03

Matrix Spikes:

Date Leached –

Date Extracted 3/29/95

Instrument No. 50

Date Analyzed 3/30/95

Stock Solution No. 4013

Sample Spiked 057 : 059

Matrix Spikes:

Matrix WATER

Units ug/L

Calibration Curve:

Instrument No. 50

Date Analyzed 3/1/95

Aroclor	Spike Added	Sample Conc.	MS Conc.	MS % Rec. 3)	Quality Control Limits In-House water	soil	oil	QC Limits 1) 2)
Aroclor 1016					-	-	-	50 - 114
Aroclor 1221					-	-	-	15 - 178
Aroclor 1232					-	-	-	10 - 215
Aroclor 1242					-	-	-	39 - 150
Aroclor 1248	1	0	0.97	97	51 - 130	-	-	38 - 158
Aroclor 1254					-	-	D - 146	29 - 131
Aroclor 1260					-	46 - 135	-	8 - 127

Aroclor	Spike Added	MSD Conc.	MSD % Rec. 3)	% RPD 3)	QC Limits Precision w	s	o	Quality Control Limits In-House water	soil	oil	QC Limits 1) 2)
Aroclor 1016					–	–	–	-	-	-	50 - 114
Aroclor 1221					–	–	–	-	-	-	15 - 178
Aroclor 1232					–	–	–	-	-	-	10 - 215
Aroclor 1242					–	–	–	-	-	-	39 - 150
Aroclor 1248					68	–	–	51 - 130	-	-	38 - 158
Aroclor 1254					–	–		-	-	D - 146	29 - 131
Aroclor 1260					–	46	–	-	46 - 135	-	8 - 127

Footnotes:

1) QC Acceptance Criteria, Table 3, Method 8080, "Test Methods for Evaluating Solid Waste", SW-846, 3rd ED., Revision 1, November 1990

2) QC Acceptance Criteria, Table 3, Method 608, Guidelines Establishing Test Procedures for Analysis of Pollutants Under the Clean Water Act, 40 CFR Part 136, October 26, 1984

3) Flag recoveries outside of control limits with an "*"

Prepared by: ____________ Date: ________

Keypunched : ____________ Date:

PCB

UPSTATE LABORATORIES, INC.
MATRIX SPIKE FORM

QC Group Number PA 1655

EPA Methods 608 and 8080 ULI S60-0-03

Matrix Spikes:
Date Leached -
Date Extracted 4/12/95
Instrument No. 50
Date Analyzed 4/13/95
Stock Solution No. 4360
Sample Spiked 101-027

Matrix Spikes:
Matrix Water
Units ug/L

Calibration Curve:
Instrument No. 50
Date Analyzed 3/14/95

Aroclor	Spike Added	Sample Conc.	MS Conc.	MS % Rec. 3)	Quality Control Limits In-House			CC Limits 1) 2)
					water	soil	oil	
Aroclor 1016					-	-	-	50 - 114
Aroclor 1221					-	-	-	15 - 178
Aroclor 1232					-	-	-	10 - 215
Aroclor 1242					-	-	-	39 - 150
Aroclor 1248	1	0	0.89	89	51 - 130	-	-	38 - 158
Aroclor 1254					-	-	D - 146	29 - 131
Aroclor 1260					-	46 - 135	-	8 - 127

Aroclor	Spike Added	MSD Conc.	MSD % Rec. 3)	% RPD 3)	QC Limits Precision			Quality Control Limits In-House			CC Limits 1) 2)
					w	s	o	water	soil	oil	
Aroclor 1016					-	-	-	-	-	-	50 - 114
Aroclor 1221					-	-	-	-	-	-	15 - 178
Aroclor 1232					-	-	-	-	-	-	10 - 215
Aroclor 1242					-	-	-	-	-	-	39 - 150
Aroclor 1248					68	-	-	51 - 130	-	-	38 - 158
Aroclor 1254					-	-		-	-	D - 146	29 - 131
Aroclor 1260					-	46	-	-	46 - 135	-	8 - 127

Footnotes:

1) QC Acceptance Criteria, Table 3, Method 8080, "Test Methods for Evaluating Solid Waste", SW-846, 3rd ED., Revision 1, November 1990

2) QC Acceptance Criteria, Table 3, Method 608, Guidelines Establishing Test Procedures for Analysis of Pollutants Under the Clean Water Act, 40 CFR Part 136, October 26, 1984

3) Flag recoveries outside of control limits with an "*"

Prepared by: ____________ Date: ________

Keypunched : ____________ Date: ________

PCB

UPSTATE LABORATORIES, INC.
MATRIX SPIKE FORM

QC Group Number PA 1677

EPA Methods 608 and 8080 ULI S60-0-03

Matrix Spikes:
Date Leached —
Date Extracted 4/19/95
Instrument No. 50
Date Analyzed 4/19/95
Stock Solution No. 4363
Sample Spiked 108-080

Matrix Spikes:
Matrix water
Units ugl

Calibration Curve:
Instrument No. 50
Date Analyzed 3/14/95

Aroclor	Spike Added	Sample Conc.	MS Conc.	MS % Rec. 3)	Quality Control Limits In-House water	soil	oil	QC Limits 1) 2)
Aroclor 1016								
Aroclor 1221					-	-	-	50 - 114
Aroclor 1232					-	-	-	15 - 178
Aroclor 1242					-	-	-	10 - 215
Aroclor 1248	1.0	0	.90	90	-	-	-	39 - 150
Aroclor 1254					51 - 130	-	-	38 - 158
Aroclor 1260					-	-	D - 146	29 - 131
					-	46 - 135	-	8 - 127

Aroclor	Spike Added	MSD Conc.	MSD % Rec. 3)	% RPD 3)	QC Limits Precision w	s	o	Quality Control Limits In-House water	soil	oil	QC Limits 1) 2)
Aroclor 1016											
Aroclor 1221					-	-	-	-	-	-	50 - 114
Aroclor 1232					-	-	-	-	-	-	15 - 178
Aroclor 1242					-	-	-	-	-	-	10 - 215
Aroclor 1248					-	-	-	-	-	-	39 - 150
Aroclor 1254					68	-	-	51 - 130	-	-	38 - 158
Aroclor 1260					-	-		-	-	D - 146	29 - 131
					-	46	-	-	46 - 135	-	8 - 127

Footnotes:

1) QC Acceptance Criteria, Table 3, Method 8080, "Test Methods for Evaluating Solid Waste", SW-846, 3rd ED., Revision 1, November 1990
2) QC Acceptance Criteria, Table 3, Method 608, Guidelines Establishing Test Procedures for Analysis of Pollutants Under the Clean Water Act, 40 CFR Part 136, October 26, 1984
3) Flag recoveries outside of control limits with an "*"

Prepared by: ____________ Date: ________

Keypunched : ____________ Date: ________

PCB

UPSTATE LABORATORIES, INC.
MATRIX SPIKE FORM

QC Group Number PA1705

EPA Methods 608 and 8080 ULI S60-0-03

Matrix Spikes:
Date Leached -
Date Extracted 3/23/95
Instrument No. 50
Date Analyzed 4/28/95
Stock Solution No. 4360
Sample Spiked 115-089

Matrix Spikes:
Matrix WATER
Units ug/L

Calibration Curve:
Instrument No. 50
Date Analyzed 3/14/95

Aroclor	Spike Added	Sample Conc.	MS Conc.	MS % Rec. 3)	Quality Control Limits In-House water	soil	oil	QC Limits 1) 2)
Aroclor 1016					-	-	-	50 - 114
Aroclor 1221					-	-	-	15 - 178
Aroclor 1232					-	-	-	10 - 215
Aroclor 1242					-	-	-	39 - 150
Aroclor 1248	1	0.80	0.80	80	51 - 130	-	-	38 - 158
Aroclor 1254					-	-	D - 146	29 - 131
Aroclor 1260					-	46 - 135	-	8 - 127

Aroclor	Spike Added	MSD Conc.	MSD % Rec. 3)	% RPD 3)	QC Limits Precision w	s	o	Quality Control Limits In-House water	soil	oil	QC Limits 1) 2)
Aroclor 1016					-	-	-	-	-	-	50 - 114
Aroclor 1221					-	-	-	-	-	-	15 - 178
Aroclor 1232					-	-	-	-	-	-	10 - 215
Aroclor 1242					-	-	-	-	-	-	39 - 150
Aroclor 1248					68	-	-	51 - 130	-	-	38 - 158
Aroclor 1254					-	-		-	-	D - 146	29 - 131
Aroclor 1260					-	46	-	-	46 - 135	-	8 - 127

Footnotes:

1) QC Acceptance Criteria, Table 3, Method 8080, "Test Methods for Evaluating Solid Waste", SW-846, 3rd ED., Revision 1, November 1990

2) QC Acceptance Criteria, Table 3, Method 608, Guidelines Establishing Test Procedures for Analysis of Pollutants Under the Clean Water Act, 40 CFR Part 136, October 26, 1984

3) Flag recoveries outside of control limits with an "*"

Prepared by: ____________ Date: ________

Keypunched : ____________ Date:

Data Validation Services

Cobble Creek Road P. O. Box 208
North Creek, NY 12853
Phone and Fax (518) 251-4429

Facsimile Transmission

TO:	Kathy Galanti
COMPANY:	Wehran Emcon
FAX NUMBER:	716-773-1828
FROM:	Judy Harry
DATE:	8-7-95
No. of pages (including cover):	2

Attached, please find a copy of a request sent to Upstate today. Additionally, I need a statement from Wehran regarding sample storage prior to shipment. In many instances, the GM samples were collected up to four days before shipment (this is not customary). Therefore, the storage conditions should be documented. This is of particular concern in that many of the samples were not packed on ice for shipment. A memo-form statement from the sampler is sufficient. Please call me if you wish to discuss this item.

All review is complete, and report generation can be finalized upon receipt of the requests of these two communications.

MEMORANDUM

TO: Judy Harry, Data Validation Services

FROM: Kathy Galanti, EMCON

RE: GM RI Sample Storage and Shipment

DATE: August 14, 1995
PROJECT: 84853-0P6.000

As you noted in the analytical data from Upstate Labs, samples collected during the GM Remedial Investigation were often sent to the lab up to four days after being collected. EMCON is aware of this and was responsible for the delay in shipment. In order to control analytical expenses and shipping costs, samples were often held in order to send the greatest number of samples in a sample data group, minimizing the number of QA/QC samples required. In the time between sampling and shipment, samples were kept cool (less than 40°C) and under appropriate custody at the EMCON office. Additi9onally, due to time constraints in the field, some samples were shipped to the lab without iced. It was not anticipated that this would be a problem since the parameters of interest were lead and PCBs only.

Please let me know if you have any more questions regarding the field activities.

ENE-G11 J:\GM\84853000.000\KBG\VAL\DAT.DOC-95\ kgalanti:1

Narrative

1.0 Summary

This report presents the laboratory test results for four soil samples and one equipment blank collected from Buffalo, New York. The samples were analyzed for total lead.

2.0 Chain of Custody

The samples were collected by Wehran EMCON on March 21, 1995 and hand delivered to Upstate Laboratories, Inc., Syracuse, New York. The Chain of Custody documentation is copied in Volume 2.

3.0 Methodology

The analyses were performed using test methods developed by the U.S. Environmental Protection Agency (EPA) and reorganized by NYSDEC into Analytical Service Protocol (ASP). The specific method numbers are:

Parameter	Method 1)
Pb	200.7 CLP-M, 239.2 CLP-M

1) NYSDEC ASP, September, 12-91, Revision

4.0 Internal Validation

The following observations are offered.

Holding Time : All criteria were satisfied following the NYSDEC ASP, revision 1991.

Inorganics:

ICP analysis : The relative % difference, for TP-1AAD, exceeded ASP criteria due to homogeneity problems.

All other criteria were satisfied.

Approved

Anthony J. Scala, Director

Narrative

1.0 ary

Thi ort presents the laboratory test results for seventeen soi oles collected from Buffalo, New York. The samples were ana for total lead.

2.0 of Custody

The es were collected by Wehran EMCON on March 24 and 27, 1995 hand delivered to Upstate Laboratories, Inc., Syracuse, New The Chain of Custody documentation is copied in Volume 2.

3.0 dology

The ses were performed using test methods developed by the U.S. ronmental Protection Agency (EPA) and reorganized by NYSDE o Analytical Service Protocol (ASP). The specific metho bers are:

Parameter	Method 1)
Pb	200.7 CLP-M, 239.2 CLP-M

NYSDEC ASP, September, 12-91, Revision

4.0 I al Validation

The f ng observations are offered.

<u>Holdi e</u> : All criteria were satisfied following the NYSDEC ASP, revision 1991.

Inorga :

ICP an s : The relative % difference, for 958S2 D, exceeded ASP criteria due to homogeneity problems.

All other criteria were satisfied.

Approved

Anthony J. Scala, Director

Narrative

1.0 Summary

This report presents the laboratory test results for eighteen soil samples collected from the Buffalo, New York. The samples were analyzed for the analytes listed in Section 3.0, below. Test results are summarized in Volume 1.

2.0 Chain of Custody

The samples were collected by EMCON, on March 24, 27, 28, 29 and 30, 1995 and hand delivered to Upstate Laboratories, Inc., Syracuse, New York, on March 27 and 31, 1995. The Chain of Custody documentation is copied in Volume 2.

3.0 Methodology

The analyses were performed using test methods developed by the U.S. Environmental Protection Agency (EPA) under RCRA and reorganized by the New York State Department of Environmental Conservation (NYSDEC) into the Analytical Services Protocol (ASP). The specific method numbers are:

Parameter	Method (3)
PCBs	8080

(3) "Test Methods for Evaluating Solid Waste, Physical / Chemical Methods", USEPA, SW-846, 3rd ED.

4.0 Internal Validation

The following observations are offered:

Holding Time

All criteria were satisfied.

PCBs

SET-A1, NWT-B2, NW-C3 and SE-C3 were diluted due to high concentrations of PCBs.

MS/MSD samples for NWT-B2 were not recoverable because of large sample dilutions.

All other criteria were satisfied.

Approved

Anthony J. Scala, Director

Narrative

1.0 ary

This ort presents the laboratory test results for two soil samp collected from Buffalo, New York. This was a re-analysis for lead of samples analyzed on 3/29/95.

2.0 of Custody

The es were collected by Wehran EMCON on March 27, 1995 and hand vered to Upstate Laboratories, Inc., Syracuse, New York. The of Custody documentation is copied in Volume 2.

3.0 dology

The ses were performed using test methods developed by the U.S. ronmental Protection Agency (EPA) and reorganized by NYSD to Analytical Service Protocol (ASP). The specific meth mbers are:

Parameter	Method 1)
Pb	239.2 CLP-M

) NYSDEC ASP, September, 12-91, Revision

4.0 al Validation

The ing observations are offered.

Hold me : All criteria were satisfied following the NYSDEC ASP, revision 1991.

Inorg s:

Furna alysis : All criteria were satisfied.

Approved

Anthony J. Scala, Director

Narrative

1.0 Summary

This report presents the laboratory test results for six soil samples collected from Buffalo, New York. The samples were analyzed for total lead.

2.0 Chain of Custody

The samples were collected by Wehran EMCON on March 28, 1995 and hand delivered to Upstate Laboratories, Inc., Syracuse, New York. The Chain of Custody documentation is copied in Volume 2.

3.0 Methodology

The analyses were performed using test methods developed by the U.S. Environmental Protection Agency (EPA) and reorganized by NYSDEC into Analytical Service Protocol (ASP). The specific method numbers are:

Parameter	Method 1)
Pb	200.7 CLP-M

1) NYSDEC ASP, September, 12-91, Revision

4.0 Internal Validation

The following observations are offered.

Holding Time : All criteria were satisfied following the NYSDEC ASP, revision 1991.

Inorganics:

ICP analysis : The relative % difference, for RW1S3 D, exceeded ASP criteria due to homogeneity problems.

All other criteria were satisfied.

Approved

Anthony J. Scala, Director

Narrative

1.0 Summary

This report presents the laboratory test results for six soil samples collected from Buffalo, New York. The samples were analyzed for TCLP lead.

2.0 Chain of Custody

The samples were collected by Wehran EMCON on March 27, 28 and 29, 1995 and hand delivered to Upstate Laboratories, Inc., Syracuse, New York. The Chain of Custody documentation is copied in Volume 2.

3.0 Methodology

The analyses were performed using test methods developed by the U.S. Environmental Protection Agency (EPA) and reorganized by NYSDEC into Analytical Service Protocol (ASP). The specific method numbers are:

Parameter	Method (1)
Pb	239.2 CLP-M, 200.7 CLP-M
TCLP Extraction	1311 (3)

(1) NYSDEC ASP, September, 12-91, Revision

(3) "Test Methods for Evaluating Solid Waste, Physical / Chemical Methods", USEPA, SW-846, 3rd ED.

4.0 Internal Validation

The following observations are offered.

<u>Holding Time</u> : All criteria were satisfied following the NYSDEC ASP, revision 1991.

Inorganics

ICP analysis : All criteria were satisifed.

Furnace analysis : All criteria were satisfied.

Approved ______________________

Anthony J. Scala, Director

Narrative

1.0 Summary

This report presents the laboratory test results for twenty six soil samples and two equipment blanks collected from Buffalo, New York. The samples were analyzed for total lead.

2.0 Chain of Custody

The samples were collected by Wehran EMCON on March 27, 28, 29 and 30, 1995 and hand delivered to Upstate Laboratories, Inc., Syracuse, New York. The Chain of Custody documentation is copied in Volume 2.

3.0 Methodology

The analyses were performed using test methods developed by the U.S. Environmental Protection Agency (EPA) and reorganized by NYSDEC into Analytical Service Protocol (ASP). The specific method numbers are:

Parameter	Method 1)
Pb	200.7 CLP-M, 239.2 CLP-M

1) NYSDEC ASP, September, 12-91, Revision

4.0 Internal Validation

The following observations are offered.

Holding Time : All criteria were satisfied following the NYSDEC ASP, revision 1991.

Inorganics:

ICP analysis : The relative % difference, for BL12S1 D, exceeded ASP criteria due to homogeneity problems.

All other criteria were satisfied.

Approved

Anthony J. Scala, Director

Narrative

1.0 Summary

This report presents the laboratory test results for two soil and twelve water samples collected from the Buffalo, New York. The samples were analyzed for the analytes listed in Section 3.0, below. Test results are summarized in Volume 1.

2.0 Chain of Custody

The samples were collected by EMCON, on March 29, 30, April 11, 17 and 21, 1995 and hand delivered to Upstate Laboratories, Inc., Syracuse, New York. The Chain of Custody documentation is copied in Volume 2.

3.0 Methodology

The analyses were performed using test methods developed by the U.S. Environmental Protection Agency (EPA) under RCRA and reorganized by the New York State Department of Environmental Conservation (NYSDEC) into the Analytical Services Protocol (ASP). The specific method numbers are:

Parameter	Method (1,2)
PCBs	8080

(1) "Test Methods for Evaluating Solid Waste, Physical / Chemical Methods", USEPA, SW-846, 3rd ED.

(2) "Analytical Services Protocol", New York State Department of Environmental Protection, 12/91 revision

4.0 Internal Validation

The following observations are offered:

Holding Time

All criteria were satisfied.

PCBs

Note: The terms reference sapmle (RS) and matrix spike blank (MSB) are interchangeable.

MH-1 and MH-2 (soil) were diluted due to high concentrations of PCBs.

MS/MSD samples for MH-1 were not recoverable because of high concentrations of PCBs.

No Aroclor 1248 spiking solution was added to matrix spike blank PA1659MSB.

All other criteria were satisfied.

Approved

Anthony J. Scala, Director

Narrative

1.0 Summary

This report presents the laboratory test results for one water sample collected from Buffalo, New York. The samples were analyzed for total lead.

2.0 Chain of Custody

The samples were collected by Wehran EMCON on April 11, 1995 and hand delivered to Upstate Laboratories, Inc., Syracuse, New York. The Chain of Custody documentation is copied in Volume 2.

3.0 Methodology

The analyses were performed using test methods developed by the U.S. Environmental Protection Agency (EPA) and reorganized by NYSDEC into Analytical Service Protocol (ASP). The specific method numbers are:

Parameter	Method 1)
Pb	239.2 CLP-M

1) NYSDEC ASP, September, 12-91, Revision

4.0 Internal Validation

The following observations are offered.

Holding Time : All criteria were satisfied following the NYSDEC ASP, revision 1991.

Inorganics:

Furnace analysis : All criteria were satisfied.

Approved

Anthony J. Scala, Director

Narrative

1.0 Summary

This report presents the laboratory test results for eleven water samples collected from Buffalo, New York. The samples were analyzed for total lead.

2.0 Chain of Custody

The samples were collected by Wehran EMCON on April 18 and 21, 1995 and hand delivered to Upstate Laboratories, Inc., Syracuse, New York. The Chain of Custody documentation is copied in Volume 2.

3.0 Methodology

The analyses were performed using test methods developed by the U.S. Environmental Protection Agency (EPA) and reorganized by NYSDEC into Analytical Service Protocol (ASP). The specific method numbers are:

Parameter	Method 1)
Pb	239.2 CLP-M

1) NYSDEC ASP, September, 12-91, Revision

4.0 Internal Validation

The following observations are offered.

Holding Time : All criteria were satisfied following the NYSDEC ASP, revision 1991.

Inorganics:

Furnace analysis : All criteria were satisfied.

Approved

Anthony J. Scala, Director

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		VOA GC/MS Method #	BNA GC/MS Method #	VOA GC Method #	Pest PCBs Method #	Metals	Other
TP-1AA	08395045	–	–	–	–	T-Pb	–
TP-1A	08395046	–	–	–	–	T-Pb	–
TP-2AA	08395047	–	–	–	–	T-Pb	–
TP-2A	08395048	–	–	–	–	T-Pb	–
Equipment Blank	08395049	–	–	–	–	T-Pb	–

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
INORGANIC ANALYSES

Laboratory Sample ID	Matrix	Parameters Requested	Date Rec'd at Lab	Date Analyzed
08395045	Soil	T–Pb	3/24/95	3/29/95
08395046	Soil	T–Pb	3/24/95	3/29/95
08395047	Soil	T–Pb	3/24/95	3/29/95
08395048	Soil	T–Pb	3/24/95	3/29/95
08395049	Water	T–Pb	3/24/95	3/29/95

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		VOA GC/MS Method #	BNA GC/MS Method #	VOA GC Method #	Pest PCBs Method #	Metals	Other
SET-D1	08695003	–	–	–	–	T-Pb	–
NWT-D2	08695004	–	–	–	–	T-Pb	–
SET-B2	08695006	–	–	–	–	T-Pb	–
NWT-A1	08695007	–	–	–	–	T-Pb	–
BL-95-8 S2	08795004	–	–	–	–	T-Pb	–
BL-95-8 S3	08795005	–	–	–	–	T-Pb	–
BL-95-7 S2	08795006	–	–	–	–	T-Pb	–
BL-95-7 S3	08795007	–	–	–	–	T-Pb	–
BL-95-5 S2	08795008	–	–	–	–	T-Pb	–
BL-95-5 S3	08795009	–	–	–	–	T-Pb	–
BL-95-6 S2	08795010	–	–	–	–	T-Pb	–
BL-95-6 S3	08795011	–	–	–	–	T-Pb	–
BL-95-13 S4	08795012	–	–	–	–	T-Pb	–
BL[illegible]-13 S2	08795013	–	–	–	–	T-Pb	–
BL[illegible]-16 S2	08795014	–	–	–	–	T-Pb	–
BL-95-16 S3	08795015	–	–	–	–	T-Pb	–
BL-95-26 S2	08795016	–	–	–	–	T-Pb	–

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
INORGANIC ANALYSES

Laboratory Sample ID	Matrix	Parameters Requested	Date Rec'd at Lab	Date Analyzed
08695003	Soil	T–Pb	3/27/95	3/29/95
08695004	Soil	T–Pb	3/27/95	3/29/95
08695006	Soil	T–Pb	3/27/95	3/29/95
08695007	Soil	T–Pb	3/27/95	3/29/95
08795004	Soil	T–Pb	3/28/95	3/29/95
08795005	Soil	T–Pb	3/28/95	3/31/95
08795006	Soil	T–Pb	3/28/95	4/3/95
08795007	Soil	T–Pb	3/28/95	4/3/95
08795008	Soil	T–Pb	3/28/95	3/29/95
08795009	Soil	T–Pb	3/28/95	4/3/95
08795010	Soil	T–Pb	3/28/95	3/29/95
08795011	Soil	T–Pb	3/28/95	3/29/95
08795012	Soil	T–Pb	3/28/95	3/29/95
08795013	Soil	T–Pb	3/28/95	3/29/95
08795014	Soil	T–Pb	3/28/95	3/29/95
08795015	Soil	T–Pb	3/28/95	3/29/95
08795016	Soil	T–Pb	3/28/95	3/29/95

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		VOA GC/MS Method #	BNA GC/MS Method #	VOA GC Method #	Pest PCBs Method #	Metals	Other
SET–A1	08695001	–	–	–	8080 PCBs	–	–
NWT–E2	08695002	–	–	–	8080 PCBs	–	–
NWT–B2	08695005	–	–	–	8080 PCBs	–	–
NW–C3	08795001	–	–	–	8080 PCBs	–	–
SE–C3	08795002	–	–	–	8080 PCBs	–	–
SE–C2	08795003	–	–	–	8080 PCBs	–	–
RW–95–1	09095018	–	–	–	8080 PCBs	–	–
BL–95–2	09095019	–	–	–	8080 PCBs	–	–
BL–95–3	09095020	–	–	–	8080 PCBs	–	–
MW–200	09095021	–	–	–	8080 PCBs	–	–
BL–9504	09095022	–	–	–	8080 PCBs	–	–
BL–95–12	09095023	–	–	–	8080 PCBs	–	–
BL–95–10 (S2)	09095122	–	–	–	8080 PCBs	–	–
95–10 (S3)	09095123	–	–	–	8080 PCBs	–	–
BL–95–1	09095127	–	–	–	8080 PCBs	–	–
MW–204	09095128	–	–	–	8080 PCBs	–	–
BL–95–20	09095132	–	–	–	8080 PCBs	–	–
MW–297	09095133	–	–	–	8080 PCBs	–	–

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
PESTICIDE/PCB
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Leached	Date Extracted	Date Analyzed
08695001	Soil	3/24/95	3/27/95	–	3/28/95	4/17/95
08695002	Soil	3/24/95	3/27/95	–	3/28/95	4/17/95
08695005	Soil	3/24/95	3/27/95	–	3/28/95	4/17/95
08795001	Soil	3/24/95	3/27/95	–	3/28/95	4/17/95
08795002	Soil	3/24/95	3/27/95	–	3/28/95	4/17/95
08795003	Soil	3/24/95	3/27/95	–	3/28/95	4/17/95
09095018	Soil	3/28/95	3/31/95	–	3/31/95	4/18/95
09095019	Soil	3/28/95	3/31/95	–	3/31/95	4/18/95
09095020	Soil	3/28/95	3/31/95	–	3/31/95	4/18/95
09095021	Soil	3/28/95	3/31/95	–	3/31/95	4/18/95
09095022	Soil	3/28/95	3/31/95	–	3/31/95	4/18/95
09095023	Soil	3/29/95	3/31/95	–	3/31/95	4/18/95
09095122	Soil	3/30/95	3/31/95	–	3/31/95	4/18/95
09095123	Soil	3/30/95	3/31/95	–	3/31/95	4/18/95
09095127	Soil	3/29/95	3/31/95	–	3/31/95	4/18/95
09095128	Soil	3/29/95	3/31/95	–	3/31/95	4/18/95
09095132	Soil	3/30/95	3/31/95	–	3/31/95	4/18/95
09095133	Soil	3/29/95	3/31/95	–	3/31/95	4/18/95

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		VOA GC/MS Method #	BNA GC/MS Method #	VOA GC Method #	Pest PCBs Method #	Metals	Other
BL-95-13(S2)	08795013	–	–	–	–	T-Pb	–
BL-95-26(S2)	08795013	–	–	–	–	T-Pb	–

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
INORGANIC ANALYSES

Laboratory Sample ID	Matrix	Parameters Requested	Date Rec'd at Lab	Date Analyzed
08795013	Soil	T–Pb	3/28/95	5/6/95
08795016	Soil	T–Pb	3/28/95	5/6/95

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		VOA GC/MS Method #	BNA GC/MS Method #	VOA GC Method #	Pest PCBs Method #	Metals	Other
RW-95-1 S3	08895018	–	–	–	–	T-Pb	–
BL-95-9 S2	08895019	–	–	–	–	T-Pb	–
BL-95-9 S3	08895020	–	–	–	–	T-Pb	–
BL-95-14 S1	08895021	–	–	–	–	T-Pb	–
MW-201 S2	08895022	–	–	–	–	T-Pb	–
MW-201 S3	08895023	–	–	–	–	T-Pb	–

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
INORGANIC ANALYSES

Laboratory Sample ID	Matrix	Parameters Requested	Date Rec'd at Lab	Date Analyzed
08895018	Soil	T–Pb	3/29/95	3/31/95
08895019	Soil	T–Pb	3/29/95	3/31/95
08895020	Soil	T–Pb	3/29/95	3/31/95
08895021	Soil	T–Pb	3/29/95	3/31/95
08895022	Soil	T–Pb	3/29/95	3/31/95
08895023	Soil	T–Pb	3/29/95	3/31/95

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		VOA GC/MS Method #	BNA GC/MS Method #	VOA GC Method #	Pest PCBs Method #	Metals	Other
BL-95-8-S2	08795004	–	–	–	–	CLP 91	–
BL-95-6-S3	08795011	–	–	–	–	CLP 91	–
BL-95-26-S2	08795016	–	–	–	–	CLP 91	–
BL-95-9-S3	08895020	–	–	–	–	CLP 91	–
BL-95-11-S2	09095125	–	–	–	–	CLP 91	–
BL-95-22-S2	09095131	–	–	–	–	CLP 91	–

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
INORGANIC ANALYSES

Laboratory Sample ID	Matrix	Parameters Requested	Date Rec'd at Lab	Date Analyzed *
08795004	Soil	TCLP Pb	3/28/95	6/26/95
08795011	Soil	TCLP Pb	3/28/95	6/26/95
08795016	Soil	TCLP Pb	3/28/95	6/26/95
08895020	Soil	TCLP Pb	3/29/95	6/26/95
09095125	Soil	TCLP Pb	3/31/95	6/23/95
09095131	Soil	TCLP Pb	3/31/95	6/23/95

* Dates are for Hg only

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		VOA GC/MS Method #	BNA GC/MS Method #	VOA GC Method #	Pest PCBs Method #	Metals	Other
BL–95–3 S2	09095007	–	–	–	–	T–Pb	–
BL–95–3 S3	09095008	–	–	–	–	T–Pb	–
MW–200 S2	09095009	–	–	–	–	T–Pb	–
MW–200 S3	09095010	–	–	–	–	T–Pb	–
BL–95–2 S2	09095011	–	–	–	–	T–Pb	–
BL–95–2 S1	09095012	–	–	–	–	T–Pb	–
BL–95–4 S2	09095013	–	–	–	–	T–Pb	–
BL–95–4 S3	09095014	–	–	–	–	T–Pb	–
MW–299 S3	09095015	–	–	–	–	T–Pb	–
BL–95–15 S1	09095024	–	–	–	–	T–Pb	–
MW–204 S3	09095025	–	–	–	–	T–Pb	–
MW–298 S3	09095026	–	–	–	–	T–Pb	–
BL–95–12 S1	09095118	–	–	–	–	T–Pb	–
BL–95–12 S2	09095119	–	–	–	–	T–Pb	–
BL[illegible]–14 S2	09095120	–	–	–	–	T–Pb	–
BL–95–15 S2	09095121	–	–	–	–	T–Pb	–
BL–95–10 S2	09095122	–	–	–	–	T–Pb	–
BL–95–10 S3	09095123	–	–	–	–	T–Pb	–
BL–95–11 S1	09095124	–	–	–	–	T–Pb	–
BL–95–11 S2	09095125	–	–	–	–	T–Pb	–
BL–95–1 S1	09095126	–	–	–	–	T–Pb	–
BL–95–1 S2	09095127	–	–	–	–	T–Pb	–
MW–204 S2	09095128	–	–	–	–	T–Pb	–
Equipment Blank 1	09095129	–	–	–	–	T–Pb	–
Equipment Blank 2	09095130	–	–	–	–	T–Pb	–
BL–95–22 S2	09095131	–	–	–	–	T–Pb	–
BL–95–20 S2	09095132	–	–	–	–	T–Pb	–
MW–95–1 S2	09095157	–	–	–	–	T–Pb	–

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
INORGANIC ANALYSES

Laboratory Sample ID	Matrix	Parameters Requested	Date Rec'd at Lab	Date Analyzed
09095007	Soil	T-Pb	3/31/95	4/8/95
09095008	Soil	T-Pb	3/31/95	4/8/95
09095009	Soil	T-Pb	3/31/95	4/10/95
09095010	Soil	T-Pb	3/31/95	4/8/95
09095011	Soil	T-Pb	3/31/95	4/4/95
09095012	Soil	T-Pb	3/31/95	4/4/95
09095013	Soil	T-Pb	3/31/95	4/11/95
09095014	Soil	T-Pb	3/31/95	4/8/95
09095015	Soil	T-Pb	3/31/95	4/8/95
09095024	Soil	T-Pb	3/31/95	4/4/95
09095025	Soil	T-Pb	3/31/95	4/10/95
09095026	Soil	T-Pb	3/31/95	4/10/95
09095118	Soil	T-Pb	3/31/95	4/4/95
09095119	Soil	T-Pb	3/31/95	4/11/95
09095120	Soil	T-Pb	3/31/95	4/11/95
09095121	Soil	T-Pb	3/31/95	4/11/95
09095122	Soil	T-Pb	3/31/95	4/11/95
09095123	Soil	T-Pb	3/31/95	4/4/95
09095124	Soil	T-Pb	3/31/95	4/4/95
09095125	Soil	T-Pb	3/31/95	4/4/95
09095126	Soil	T-Pb	3/31/95	4/4/95
09095127	Soil	T-Pb	3/31/95	4/4/95
09095128	Soil	T-Pb	3/31/95	4/4/95
09095129	Water	T-Pb	3/31/95	4/7/95
09095130	Water	T-Pb	3/31/95	4/7/95
09095131	Soil	T-Pb	3/31/95	4/4/95
09095132	Soil	T-Pb	3/31/95	4/11/95
09095157	Soil	T-Pb	3/31/95	4/4/95

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND
ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		VOA GC/MS Method #	BNA GC/MS Method #	VOA GC Method #	Pest PCBs Method #	Metals	Other
quipment Blank 2	09095129	–	–	–	8080 PCBs	–	–
quipment Blank 3	09095130	–	–	–	8080 PCBs	–	–
H-1	10295009	–	–	–	8080 PCBs	–	–
H-2 (water)	10295010	–	–	–	8080 PCBs	–	–
H-2 (soil)	10295011	–	–	–	8080 PCBs	–	–
N-1	11095020	–	–	–	8080 PCBs	–	–
N-5	11095021	–	–	–	8080 PCBs	–	–
N-200	11095015	–	–	–	8080 PCBs	–	–
N-201	11095016	–	–	–	8080 PCBs	–	–
N-202	11095017	–	–	–	8080 PCBs	–	–
N-203	11095018	–	–	–	8080 PCBs	–	–
N-204	11095019	–	–	–	8080 PCBs	–	–
V-95-1	11495096	–	–	–	8080 PCBs	–	–
V-[illegible]2	11495097	–	–	–	8080 PCBs	–	–

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
PESTICIDE/PCB
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Leached	Date Extracted	Date Analyzed
09095129	Water	3/29/95	3/31/95	–	3/31/95	4/21/95
09095130	Water	3/30/95	3/31/95	–	3/31/95	4/21/95
10295009	Soil	4/11/95	4/12/95	–	4/13/95	4/21/95
10295010	Water	4/11/95	4/12/95	–	4/12/95	5/3/95
10295011	Soil	4/11/95	4/12/95	–	4/13/95	5/3/95
11095015	Water	4/17/95	4/20/95	–	4/20/95	4/25/95
11095016	Water	4/17/95	4/20/95	–	4/20/95	4/25/95
11095017	Water	4/17/95	4/20/95	–	4/20/95	4/25/95
11095018	Water	4/17/95	4/20/95	–	4/20/95	4/25/95
11095019	Water	4/17/95	4/20/95	–	4/20/95	4/25/95
11095020	Water	4/17/95	4/20/95	–	4/20/95	4/25/95
11095021	Water	4/17/95	4/20/95	–	4/20/95	4/25/95
11495096	Water	4/21/95	4/21/95	–	4/27/95	5/3/95
11495097	Water	4/21/95	4/21/95	–	4/27/95	5/3/95

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		VOA GC/MS Method #	BNA GC/MS Method #	VOA GC Method #	Pest PCBs Method #	Metals	Other
MH-2	10295010	–	–	–	–	T-Pb	–

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
INORGANIC ANALYSES

Laboratory Sample ID	Matrix	Parameters Requested	Date Rec'd at Lab	Date Analyzed
10295010	Water	T-Pb	4/12/95	4/20/95

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		VOA GC/MS Method #	BNA GC/MS Method #	VOA GC Method #	Pest PCBs Method #	Metals	Other
EBT	11095028	–	–	–	–	T–Pb	–
MW1	11495095	–	–	–	–	T&D–Pb	–
MW–5	11095024	–	–	–	–	T&D–Pb	–
MW200	11495092	–	–	–	–	T&D–Pb	–
MW201	11495093	–	–	–	–	T&D–Pb	–
MW202	11495094	–	–	–	–	T&D–Pb	–
MW203	11095022	–	–	–	–	T&D–Pb	–
MW204	11095023	–	–	–	–	T&D–Pb	–
MW404	11095026	–	–	–	–	T–Pb	–
MW408	11095027	–	–	–	–	T–Pb	–
RW951	11095025	–	–	–	–	T&D–Pb	–

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
INORGANIC ANALYSES

Laboratory Sample ID	Matrix	Parameters Requested	Date Rec'd at Lab	Date Analyzed
11095022	Water	T&D–Pb	4/20/95	5/2/95
11095023	Water	T&D–Pb	4/20/95	5/2/95
11095024	Water	T&D–Pb	4/20/95	5/2/95
11095025	Water	T&D–Pb	4/20/95	5/2/95
11095026	Water	T–Pb	4/20/95	5/2/95
11095027	Water	T–Pb	4/20/95	5/2/95
11095028	Water	T–Pb	4/20/95	5/2/95
11495092	Water	T&D–Pb	4/21/95	5/2/95
11495093	Water	T&D–Pb	4/21/95	5/2/95
11495094	Water	T&D–Pb	4/21/95	5/2/95
11495095	Water	T&D–Pb	4/21/95	5/2/95

Data Validation Services

Cobble Creek Road P. O. Box 208
North Creek, N. Y. 12853
Phone 518-251-4429

RECEIVED SEP 19 1995

September 18, 1995

Kathy Galanti
Wehran Emcon
1775 Baseline Rd. Ste 220
Grand Island, NY 14072

RE: Validation of General Motors Site Data Package
Upstate SDG No. EMC08

Dear Ms. Galanti:

Review has been completed for the data package SDG EMC08 generated by Upstate Labs, pertaining to samples collected at the General Motors Site. Four soil and three aqueous samples were processed for PCBs; four of these were analysed for total lead. Matrix spikes/duplicates were processed for both parameters. Methodologies utilized are those of the 1991 NYSDEC ASP CLP.

Data validation was performed with guidance from the most current editions of the USEPA CLP National Functional Guidelines for Organic and Inorganic Data Review, and the EPA SOPs HW-2 and HW-6. The following items were reviewed:

- Data Completeness
- Custody Documentation
- Holding Times
- Surrogate Recoveries
- Matrix Spike Recoveries/Duplicate Correlations
- Preparation/Calibration Blanks
- Control Spike/Laboratory Control Samples
- Calibration Standards
- Instrument IDLs
- Method Compliance
- Sample Result Verification

Those items showing deficiencies are discussed in the following sections of this report. All others were found to be acceptable as outlined in the above-mentioned validation procedures, and as applicable for the methodology. Unless noted specifically in the following text, reported results are substantiated by the raw data, and generated in compliance with protocol requirements.

In summary, sample processing for lead was primarily conducted with compliance to protocol requirements and with adherance to quality criteria. PCB processing included numerous outlying standard responses. Certain edits to, and qualification of, reported results are indicated. These issues are discussed in the following analytical sections.

Copies of laboratory case narratives are attached to this narrative, and should be reviewed in conjunction with this narrative. A compliancy chart and laboratory NYSDEC Sample Preparation and Analysis Summary Forms are also included with this report.

Sample Custody/Condition at Receipt

Samples NWT-A1 and NTW-B1 were collected 59 days prior to laboratory receipt. Due to this extended holding time, the reported detection limits of the nondetected PCB mixtures should be rejected. The detected PCB values for the samples should be considered estimated, possibly biased very low. Other of the samples were collected four to six days prior to lab receipt (see attached communications). Technical holding times from receipt were met, and no impact on sample reported results is indicated.

PCB Analyses

Please see above discussion regarding qualification of NWT-A1 and NWT-B1 due to holding time. NWT-B1 also produced low surrogate recoveries (30% to 36%), below the recommended limit of 60%. Other sample surrogate recoveries were acceptable. Three samples produced one of the four surrogates with slightly low recoveries (all were above 52%); these should have been flagged on the surrogate summary Form 2. Sample reported results are unaffected by these recoveries.

Aqueous matrix spike blanks (MSBs) of Aroclor 1248 were acceptable, with values of 91% and 97%. The soil matrix spikes were performed with a spike concentration of about twenty times the protocol required level, due to previous project sample results showing very high sample PCB concentrations. The soil matrix spike recoveries of 1248 in NWT-B1 were high (407% and 383%). The high recoveries are likely a result of calculation against falsely low sample values due to poor extraction efficiency in the sample itself (as evidenced by the above-mentioned low surrogate recoveries). The matrix spike surrogate recoveries were good. No aqueous matrix spikes were performed due to nsufficient sample volume available.

Due to poor correlation of the individual isomer responses for the reported Aroclor 1242 in MW203, identification as a PCB mixture is not assured. Therefore, the reported result for that mixture in the sample should be considered as a tentative identification ("N" flag), and the value as estimated in nature.

Although initial calibration standards are performed at levels as low as the sample reported 'etection limits, the daily calibration standards are analysed at 20 times the reported detection limits. The daily standard concentration is too high to provide confidence in detection of low levels on a given day, especially considering the sampl analyses are about eight weeks after the initial calibration standards were run. Therefore all project sample reported detection limits for nondetected PCBs should be considered estimated. It is noted that the 20 ng concentration standards used in the five point initial calibration were analysed days after the other initial calibration standards.

The response of the daily calibration standards were generally acceptable (below 25% D). An exception is the response for Aroclor 1248 on column HP-5 in the 6/7/95 standard, which was low, at 36%D. This standard is associated with the analyses of all samples except the soil MH2R2. The nondetected sample results for Aroclor 1248 are not affected (due to compliant response on column DB-608). The detected sample Aroclor 1248 values which are derived from the HP-5 column should be considered estimated. The affected samples are: aqueous MH1R2, NWT-A1, and NWT-B1.

Soil sample MW2R2 required dilution of 500. The solvency of the extraction may have been exceeded, and the reported results should be considered estimated, possibly biased low.

Many of the daily calibration standard summary forms were incomplete as regards values and percent differences. Raw data was reviewed for acceptability.

Sample Forms 1 should show extract volumes, injection volumes, etc.
Surrogate Forms 2 should flag outlying values.
Forms 10B should have been provided for matrix spike blanks.

Total Lead Analyses

Matrix spikes were performed on MH1R2 (aqueous) amd MH1R2 (soil). All accuracy and precision values were acceptable except the duplicate precision in the soil, which was 49%RPD. No qualification to sample reported results is indicated.

Calibration standard CCV2 produced an initial reading just above the allowable limit of 22 ug/L, at 22.1 ug/L. The standard was reanalysed with acceptable recovery. Sample reported results are not significantly affected.

All other protocol requirements were met; sample reported results are substantiated by the raw data.

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,

Judy Harry

dy Harry

COMPLIANCY CHART

Project: Wehran Emcon - General Motors

SDG Nos. Upstate SDG EMC08

Protocol: 1991 NYSDEC ASP SW846

Rec. Date	Sample ID	Matrix	PCB	Pb	Noncompliance
05-22-95	MW203	Aqueous	NO	NR	1,2
05-22-95	MH-1R2	Soil	NO	OK	1,2
05-22-95	MH-1R2	Aqueous	NO	OK	1,2
05-22-95	MH-2R2	Soil	NO	OK	1
05-22-95	NWT-B1	Soil	NO	NR	1,2
05-22-95	NWT-A1	Soil	NO	NR	1,2
05-22-95	MW-2R2	Aqueous	NO	OK	1,2

1. PCB daily standards at incorrect concentrations.
2. PCB daily standards with outlying responses.

Data Validation Services
Cobble Creek Road P. O. Box 208
North Creek, NY 12853
Phone and Fax (518) 251-4429

Facsimile Transmission

TO: Kathy Galanti

COMPANY: Wehran Emcon

FAX NUMBER: 716-773-1828

FROM: Judy Harry

DATE: 8-7-95

No. of pages (including cover): 2

Attached, please find a copy of a request sent to Upstate today. Additionally, I need a statement from Wehran regarding sample storage prior to shipment. In many instances, the GM samples were collected up to four days before shipment (this is not customary). Therefore, the storage conditions should be documented. This is of particular concern in that many of the samples were not packed on ice for shipment. A memo-form statement from the sampler is sufficient. Please call me if you wish to discuss this item.

All review is complete, and report generation can be finalized upon receipt of the requests of these two communications.

MEMORANDUM

TO: Judy Harry, Data Validation Services

FROM: Kathy Galanti, EMCON KBG

RE: GM RI Sample Storage and Shipment

DATE: August 14, 1995
PROJECT: 84853-0P6.000

As you noted in the analytical data from Upstate Labs, samples collected during the GM Remedial Investigation were often sent to the lab up to four days after being collected. EMCON is aware of this and was responsible for the delay in shipment. In order to control analytical expenses and shipping costs, samples were often held in order to send the greatest number of samples in a sample data group, minimizing the number of QA/QC samples required. In the time between sampling and shipment, samples were kept cool (less than 40°C) and under appropriate custody at the EMCON office. Additi9onally, due to time constraints in the field, some samples were shipped to the lab without iced. It was not anticipated that this would be a problem since the parameters of interest were lead and PCBs only.

Please let me know if you have any more questions regarding the field activities.

Data Validation Services

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TO: Wendy Wagner

COMPANY: Upstate Labs

FAX NUMBER: 315 437 1209

FROM: Judy Harry

DATE: 9-11-95

No. of pages (including cover): 1

COMMENTS: RE: Wehran/Emcon Gm SDG EMC08

Please review the reported results for PCBs for MH-2R2 (soil), NWT-A1, and NWT-B1. These samples appear to have reportable levels of Aroclor 1260. The levels in the "NWT" samples are at or close to detection limit, but the samples are diluted 1:50, and could have been run at a lower dilution for the 1260 quantitation. Please see if you concur, and respond ASAP, with copies to Kathy Galanti. Thanks. Judy

Keith L. deClercq

Organics Supervisor,Upstate Laboratories

9/12/95

Ms Harry,

I have reviewed the chromatograms in question and compared them to chromatograms of the appropriate Aroclors. Although all of the Aroclor 1260 quantitiation peaks are present in the samples, they are also present in the calibration standards for 1248. The overall pattern of peaks is in my opinion characteristic of 1248. Any significant amount of 1260 in addition to the 1248 would cause the overall pattern to be weighted toward the right hand side, which does not appear to be the case. The fact that virtually all of the 1260 peaks are detected in 1248 standards (especially when 1248 is present at high levels) makes it difficult to state without equivocation that no detectable 1260 is present. However, I feel my original results best reflect the contamination present in these samples.

Sincerely Yours,

Keith L. deClercq

cc: Kathy Galanti

Narrative

1.0 Summary

This report presents the laboratory test results for eight soil samples and three water samples collected from Buffalo, New York. The samples were analyzed for the analytes listed in Section 3.0, below. Test results are summarized in Volume 1.

2.0 Chain of Custody

The samples were collected by EMCON, on March 24, May 16 and 18, 1995 and hand delivered to Upstate Laboratories, Inc., Syracuse, New York. The Chain of Custody documentation is copied in Volume 2.

3.0 Methodology

The analyses were performed using test methods developed by the U.S. Environmental Protection Agency (EPA) under RCRA and reorganized by the New York State Department of Environmental Conservation (NYSDEC) into the Analytical Services Protocol (ASP). The specific method numbers are:

Parameter	Method
PCBs	8080 (1,2)
Pb	239.2 CLP-M (1)

(1) "Test Methods for Evaluating Solid Waste, Physical / Chemical Methods", USEPA, SW-846, 3rd ED.

(2) "Analytical Services Protocol", New York State Department of Environmental Protection, 12/91 revision

4.0 Internal Validation

The following observations are offered:

<u>Holding Time</u>

Note comments on the Chain of Custody.

All other criteria were satisfied.

<u>PCBs</u>

Note: The terms reference sample (RS) and matrix spike blank (MSB) are interchangeable.

High level spiking solutions were used for the surrogates and PCB spiking solution. Low level solutions were used in previous analyses.

MS/MSD recoveries were abnormally high for soil sample NWT-B1. The analyst attributed this to the low recovery of PCB in the sample itself.

Extra sample was not provided for water MS/MSD.

Inorganics

All criteria were satisfied.

Approved ______________________

Anthony J. Scala, Director

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		VOA GC/MS Method #	BNA GC/MS Method #	VOA GC Method #	Pest PCBs Method #	Metals	Other
MW–203	14295083	–	–	–	8080	–	–
MH–1R2	14295084	–	–	–	–	–	Wet Chemistry
MH–1R2	14295085	–	–	–	8080	–	–
MH–1R2	14295086	–	–	–	–	CLP 91	–
MH–1R2	14295087	–	–	–	8080	CLP 91	Wet Chemistry
MH–2R2	14295088	–	–	–	–	CLP 91	–
MH–2R2	14295089	–	–	–	8080	–	–
MH–2R2	14295090	–	–	–	–	–	Wet Chemistry
NWT–B1	14295091	–	–	–	8080	–	–
NWT–A1	14295092	–	–	–	8080	–	–
MH–2R2	14295093	–	–	–	8080	CLP 91	Wet Chemistry

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
PESTICIDE/PCB
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Leached	Date Extracted	Date Analyzed
14295083	Water	5/16/95	5/22/95	–	5/23/95	6/7/95
14295085	Soil	5/18/95	5/22/95	–	5/22/95	6/6/95
14295087	Water	5/18/95	5/22/95	–	5/23/95	6/7/95
14295089	Soil	5/18/95	5/22/95	–	5/22/95	6/13/95
14295091	Soil	3/24/95	5/22/95	–	5/22/95	6/6/95
14295092	Soil	3/24/95	5/22/95	–	5/22/95	6/6/95
14295093	Water	5/18/95	5/22/95	–	5/23/95	6/7/95

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
INORGANIC ANALYSES

Laboratory Sample ID	Matrix	Parameters Requested	Date Rec'd at Lab	Date Analyzed
14295086	Soil	T-Pb	5/22/95	6/14/95
14295087	Water	T-Pb	5/22/95	6/14/95
14295088	Soil	T-Pb	5/22/95	6/14/95
14295093	Water	T-Pb	5/22/95	6/14/95