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Counsel's Request

PARCEL A-2
PHASE III ENVIRONMENTAL SITE ASSESSMENT

General Motors Corporation
Clark Avenue Facility
Detroit, Michigan

APRIL 1997

REF. NO. 8889 (24)

CONESTOGA-ROVERS & ASSOCIATES

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1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) was retained by General Motors Corporation (GM) to conduct a Phase III Environmental Site Assessment (ESA) for a portion of the GM Clark Avenue Facility located at 2860 Clark Avenue in Detroit, Michigan. The Site is defined as Parcel A-2, as identified on a survey by David C. Adams & Son (Site). The Site location is presented on Figure 1.1. A Site plan is presented on Figure 1.2.

The purpose of the Phase III ESA was to delineate the vertical and horizontal extent of contamination at each area of concern (AOC) identified during the Phase I/II ESA of the Site, which was completed from September 1996 to December 1996. The purpose of the Phase II ESA was to confirm or deny a release at all potential areas of environmental concern (PAOCs) identified during the Phase I ESA of the Site, which was also completed from September 1996 to December 1996.

This document presents a summary of the Phase III ESA activities for the Site, in the following sections:

2.0 Background
3.0 Scope of Work
4.0 Geology and Hydrogeology
5.0 Analytical Results
6.0 Conclusions

2.0 BACKGROUND

CRA conducted a Phase II ESA at the Site during the period from September 1996 through December 1996. The Phase II ESA was designed to confirm or deny a release at the PAOCs identified during the Phase I ESA.

2.1 SUMMARY OF PAOCS EVALUATED

Two (2) PAOCs were identified during the Phase I ESA (CRA, February 1997). PAOC locations are presented on Figure 2.1. The 2 PAOCs were identified during demolition oversight activities and re-evaluation of historical areas of environmental interest.

2.2 CONCLUSIONS

A total of 2 investigative boreholes were completed during the Phase II ESA on Site. Based on existing data, the North Roadway Area was identified as an AOC (A2-1). No additional AOCs were identified.

3.0 SCOPE OF WORK

CRA conducted a Phase III ESA at the Site during the period from September 1996 through February 1997. The Phase III ESA was designed to delineate the vertical and horizontal extent of impacted soil at each AOC identified during the Phase II ESA.

3.1 SUMMARY OF AOCS EVALUATED

One (1) AOC was identified during the Phase II ESA (CRA, March 1997).

Phase III ESA boreholes were installed at the AOC identified for the North Roadway Area (AOC A2-1). Phase III ESA field activities included the installation of 28 boreholes to delineate the extent of impacted soil.

3.2 BREAKDOWN OF BOREHOLES BY LOCATION

A total of 28 investigative boreholes were completed during the Phase III ESA on Site. Analytical samples were collected from 22 of the borehole locations. Figure 3.2 presents the borehole locations.

3.3 BOREHOLE INSTALLATION

3.3.1 DRILLING METHODS

Carlo Environmental Technologies (CET), of Clinton Township, Michigan, performed all Phase III ESA drilling activities at the Site from September 1996 through February 1997.

Boreholes were advanced using a drill rig equipped with 4 1/4-inch hollow stem augers, approximately two feet into the clay layer which underlies the surficial fill material at the Site. Boreholes were advanced to approximately ten feet below ground surface (bgs), or until no adverse impact was observed, whichever was deeper.

Borehole stratigraphic logs are included in Appendix A.

3.3.2 SOIL SAMPLING METHODS

Soil samples were collected continuously using split spoon samplers. Two soil samples were collected from each boring, one from the fill material and one from the underlying clay for analysis. Soil samples were screened using a photoionization detector (PID) and visually examined for staining and/or odors. The soil sample collected from the fill material which exhibited the highest PID reading, or most significant staining/odors, was submitted for analysis. The sample collected from the last split spoon advanced into the clay layer was also submitted for analysis.

Soil samples were collected by split-spoon methods in accordance with ASTM Method 1586 using the following sampling protocols:

i) soil samples were collected using a 24-inch long, 2-inch or 3-inch outside diameter carbon-steel split-spoon sampler (precleaned as described in Section 3.3.3). The split-spoon was attached to precleaned drill rods, and driven ahead of the hollow stem augers (HSAs) into the materials to be sampled using a 140-pound hammer, free falling 30 inches. The number of hammer blows were recorded for each 6-inch increment of penetration; and

ii) all collected soil samples were described and visually classified according to the USCS System, placed in precleaned laboratory-supplied jars, and submitted to the analytical laboratory for analyses.

3.3.3 DECONTAMINATION METHODS

Prior to mobilization of sampling equipment, and prior to the commencement of sampling activities, all sampling equipment was thoroughly steam-cleaned to remove oil, grease, mud and other foreign matter.

The drill rig and all downhole drilling and sampling equipment (such as augers, cutting bits, and associated equipment and tools), were cleaned using the following sequence:

i) hot potable water high-pressure, low-volume wash and hand scrubbing, as necessary, supplemented by non-phosphate detergent (Alconox); and

ii) hot potable water high-pressure, low-volume rinse.

The soil sampling equipment and tools were cleaned prior to the initial borehole, and in between each borehole installed.

Sampling equipment and tools, including split-spoons, were thoroughly cleaned using the following wash sequence:

i) cleaning with potable water and detergent (Alconox), using a brush to remove particulate matter and surface films;
ii) rinsing thoroughly with potable water;
iii) rinsing with isopropanol;
iv) rinsing thoroughly with deionized water;
v) allowing the equipment to air dry as long as possible; and
vi) wrapping with aluminum foil, if appropriate, if the equipment was to be stored or transported.

3.4 SAMPLE ANALYSIS/DATA VALIDATION

Soil samples were collected and submitted to IEA, Inc. of Cary, North Carolina, and Encotec of Ann Arbor, Michigan, and analyzed for benzene, toluene, ethylbenzene and xylene (BTEX) parameters.

The sample summary table, Table 3.1, presents a detailed list of which parameters were analyzed for each sample collected. Parameter selection was based on information obtained during the Phase II ESA for the Site and subsequent discussions with GM.

Samples were shipped via Federal Express or hand delivery to the analytical laboratories in sealed coolers packed with ice under chain-of-custody protocol. Chain-of-Custody records are included as Appendix B.

Quality assessment and validation of the analytical data reported by IEA and Encotec was conducted by CRA's quality assurance officer. The validation of the analytical data was based on laboratory blank data, recovery data from matrix and surrogate spikes, and check samples. The analytical data was assessed for accuracy and precision based on review of the blank and spike recovery data. The analytical data was determined to be valid and suitable for quantitative use specific to this project. The data quality assessment and validation memoranda are presented in Appendix C.

The analytical results for the soil samples were compared to Michigan Act 451, Part 201 Generic Industrial Direct Contact Criteria, as defined in the Environmental Response Division Operational Memorandum #14, Revision 2, dated June 6, 1995.

4.0 GEOLOGY AND HYDROGEOLOGY

4.1 SITE GEOLOGY

The Site is located on the southeastern edge of the Michigan Basin, a regional geologic feature that includes sedimentary rocks of the Paleozoic age.

An accumulation of unconsolidated sediment deposits cover most of the Michigan area, formed during the glaciation of the Pleistocene Epoch. The lacustrine glacial till is comprised of sand, silt, and clay, and has a thickness of 101 to 200 feet (Hydrogeologic Atlas of Michigan, Western Michigan University, 1981). The glacial till at the Site was reported in previous investigations to be 111 to 125 feet thick. The glacial drift is generally not an aquifer, and may include thin interbedded aquifers at depth (Hydrogeologic Atlas of Michigan, Western Michigan University, 1981). The underlying bedrock is reported to be limestone of the Dundee Limestone, a late Devonian formation. The Dundee Limestone is generally a highly fractured, brown, carboniferous rock.

Through years of development and industrial use, the native soils in many areas of the Site have been overlain by earth fill (i.e., sand and gravel), asphalt, concrete, or structures. This surficial layer of fill at the Site is generally less than ten feet thick.

4.2 SITE HYDROGEOLOGY

The stratigraphy at the Site contains two water bearing zones: a shallow perched water zone within the surficial fill and an aquifer within the limestone bedrock beneath the lacustine glacial till.

The first usable aquifer is protected by impervious material from surficial contamination. No wells in the area are reported to be located in the bedrock. The glacial drift is generally not an aquifer, but may include thin interbedded aquifers at depth (Hydrogeologic Atlas of Michigan, Western Michigan University, 1981).

It should be noted that the perched water in many areas of Detroit is considered by the Michigan Department of Environmental Quality (MDEQ)-Environmental Response Division (ERD) to be groundwater not in an aquifer.

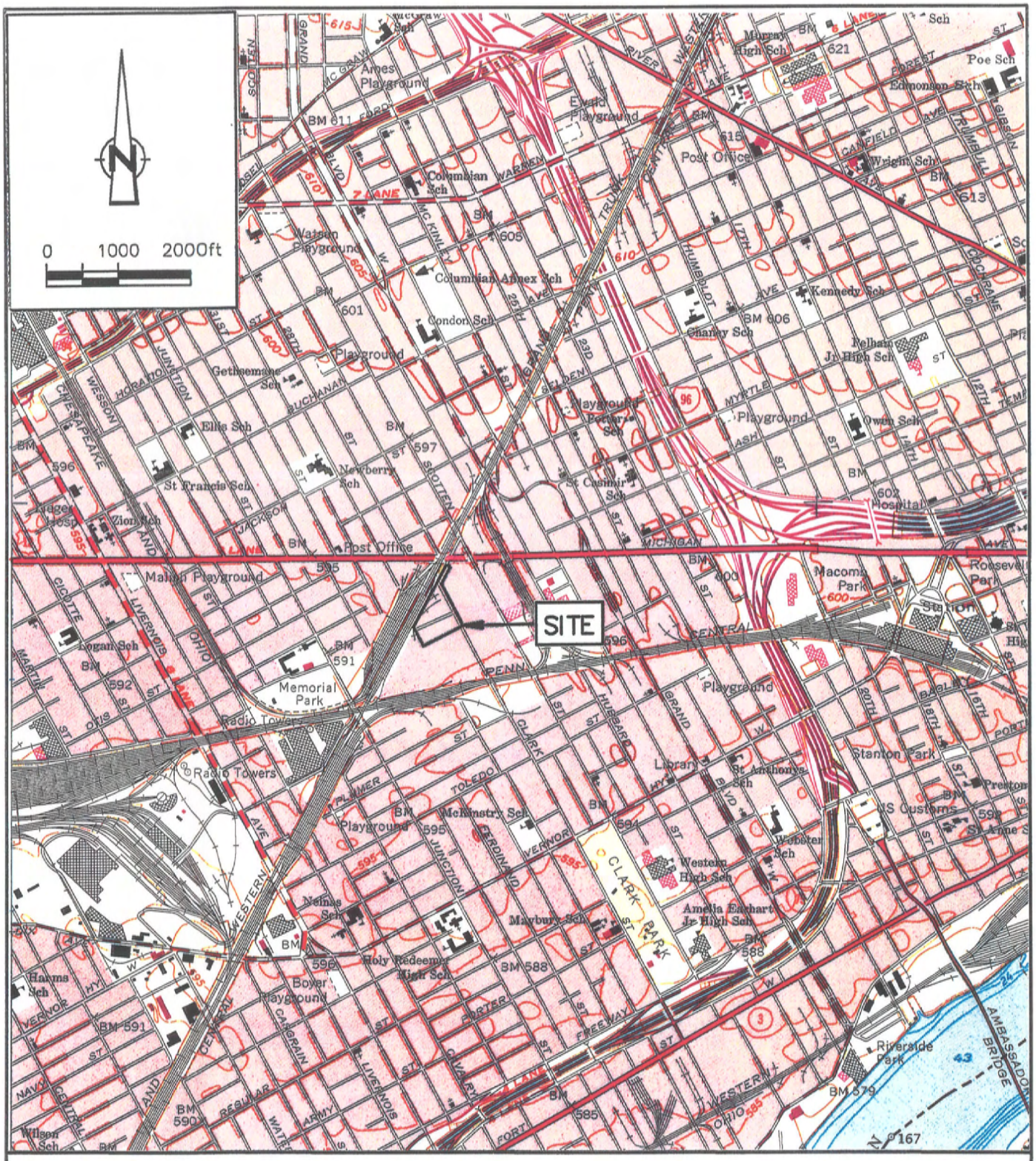
5.0 ANALYTICAL RESULTS

Samples collected from Site borehole locations were analyzed for BTEX parameters.

A summary of detected parameters in soil samples is presented in Table 5.1. No BTEX parameters were detected above the Michigan Act 451, Part 201 Generic Industrial Direct Contact Criteria in any of the soil samples.

6.0 CONCLUSIONS

AOC A2-1 has been determined through past investigations and groundwater monitoring data from area wells to be a free product area. Although no BTEX parameters were detected above Michigan Act 451, Part 201 Generic Industrial Direct Contact Criteria during the Phase III ESA, free product was observed at several borehole locations, including BH-172-96, BH-178-96, BH-178R-96, BH-179-96, and BH-182-96. The approximate extent of impacted soil is presented on Figure 6.1.



SOURCE: USGS QUADRANGLE MAP;
DETROIT, MICHIGAN

figure 1.1

SITE LOCATION
PARCEL A–2
GENERAL MOTORS CLARK AVENUE SITE
Detroit, Michigan

CRA

08889(024)DE

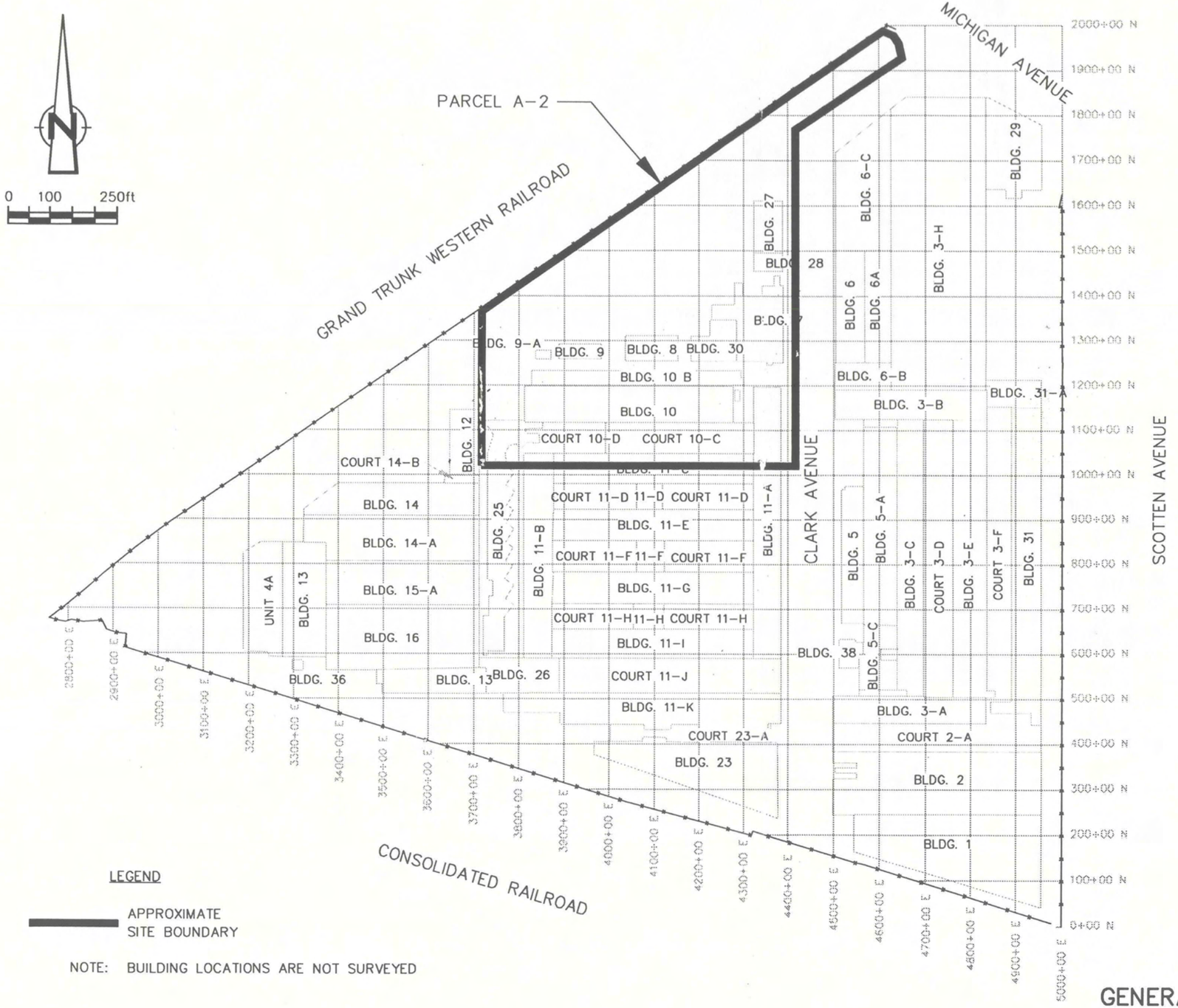
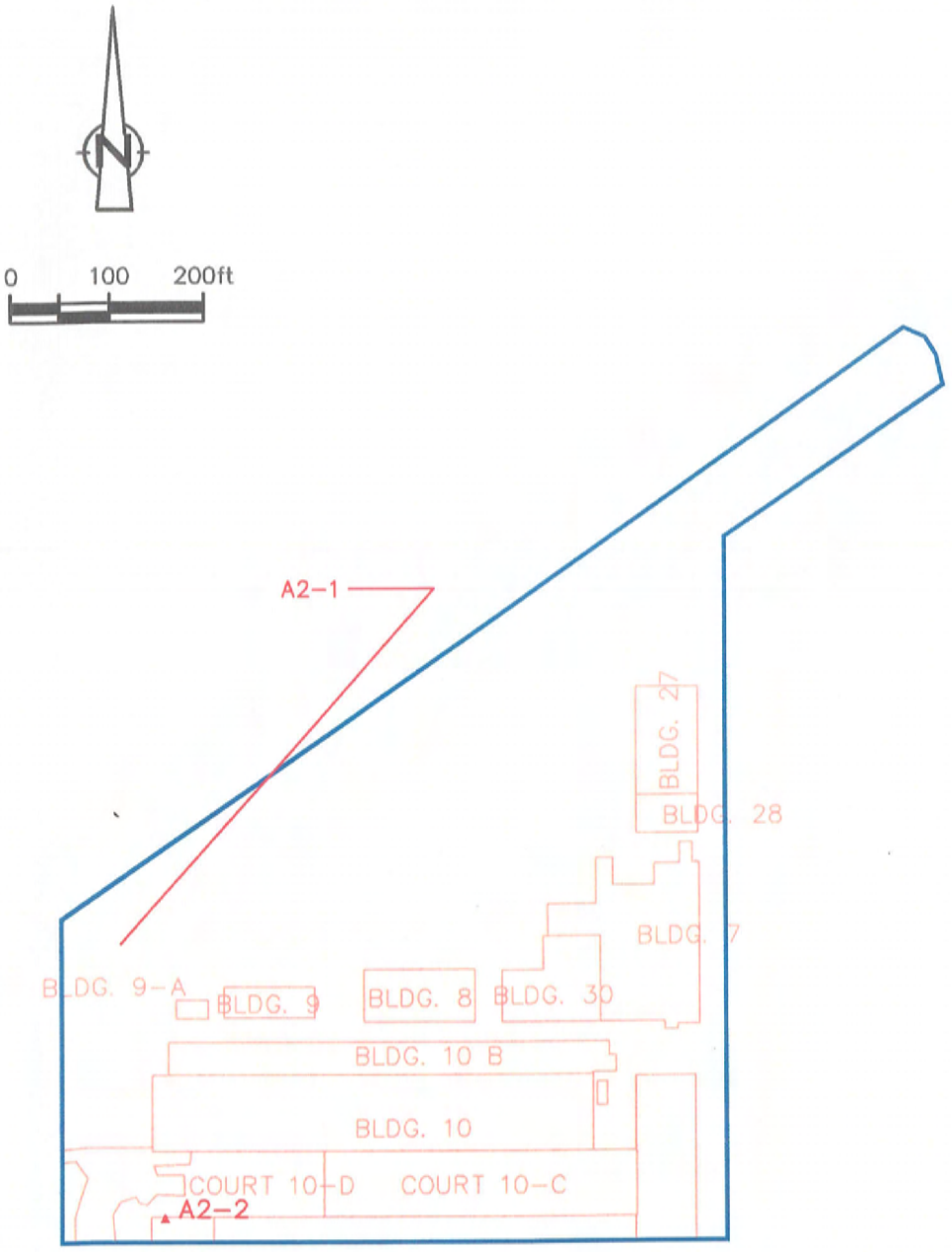


figure 1.2
SITE PLAN
PARCEL A-2
GENERAL MOTORS CLARK AVENUE SITE
Detroit, Michigan

CRA

08889(024)DE001



LEGEND

▲ A2-2 SURVEYED PAOC LOCATION

APPROXIMATE SITE BOUNDARY

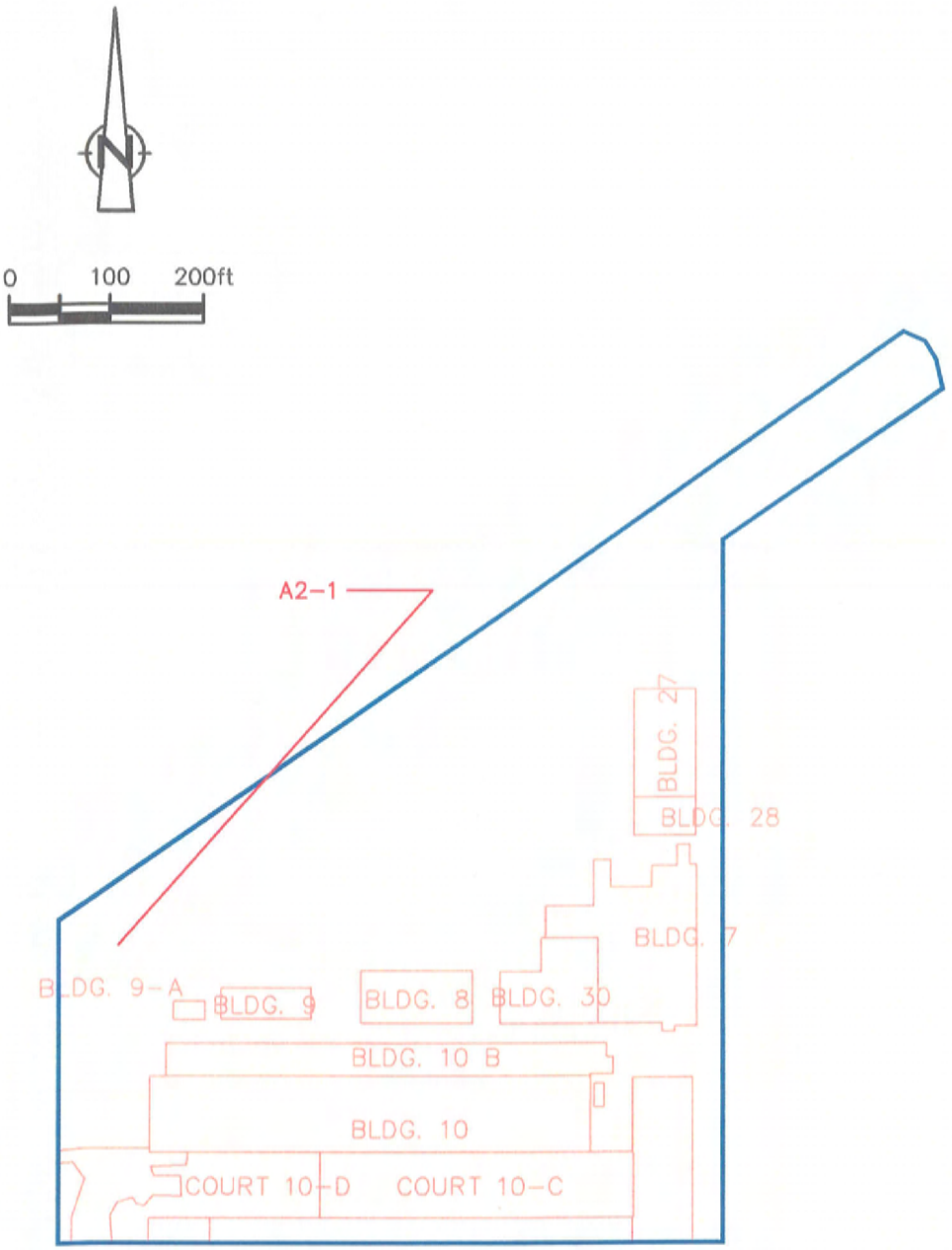
NOTE: BUILDING LOCATIONS ARE NOT SURVEYED

figure 2.1

LOCATION OF PAOCs
PARCEL A-2
GENERAL MOTORS CLARK AVENUE SITE
Detroit, Michigan

CRA

08889(024)DE004



LEGEND

APPROXIMATE SITE BOUNDARY

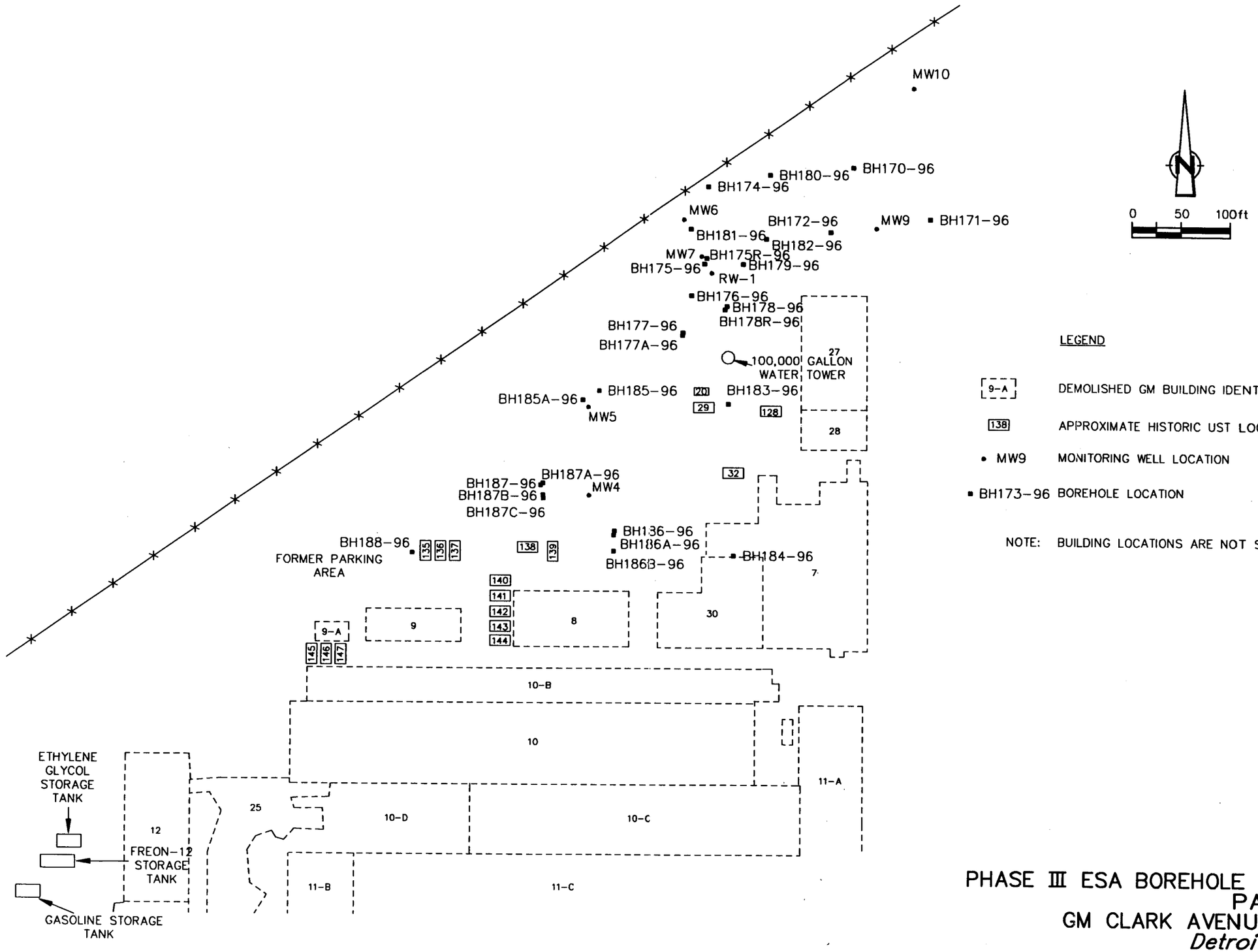
NOTE: BUILDING LOCATIONS ARE NOT SURVEYED

figure 3.1

LOCATION OF AOCs
PARCEL A-2
GENERAL MOTORS CLARK AVENUE SITE
Detroit, Michigan

CRA

08889(024)DE005



LEGEND

9-A	DEMOLISHED GM BUILDING IDENTIFICATION NUMBER
138	APPROXIMATE HISTORIC UST LOCATION
• MW9	MONITORING WELL LOCATION
▪ BH173-96	BOREHOLE LOCATION

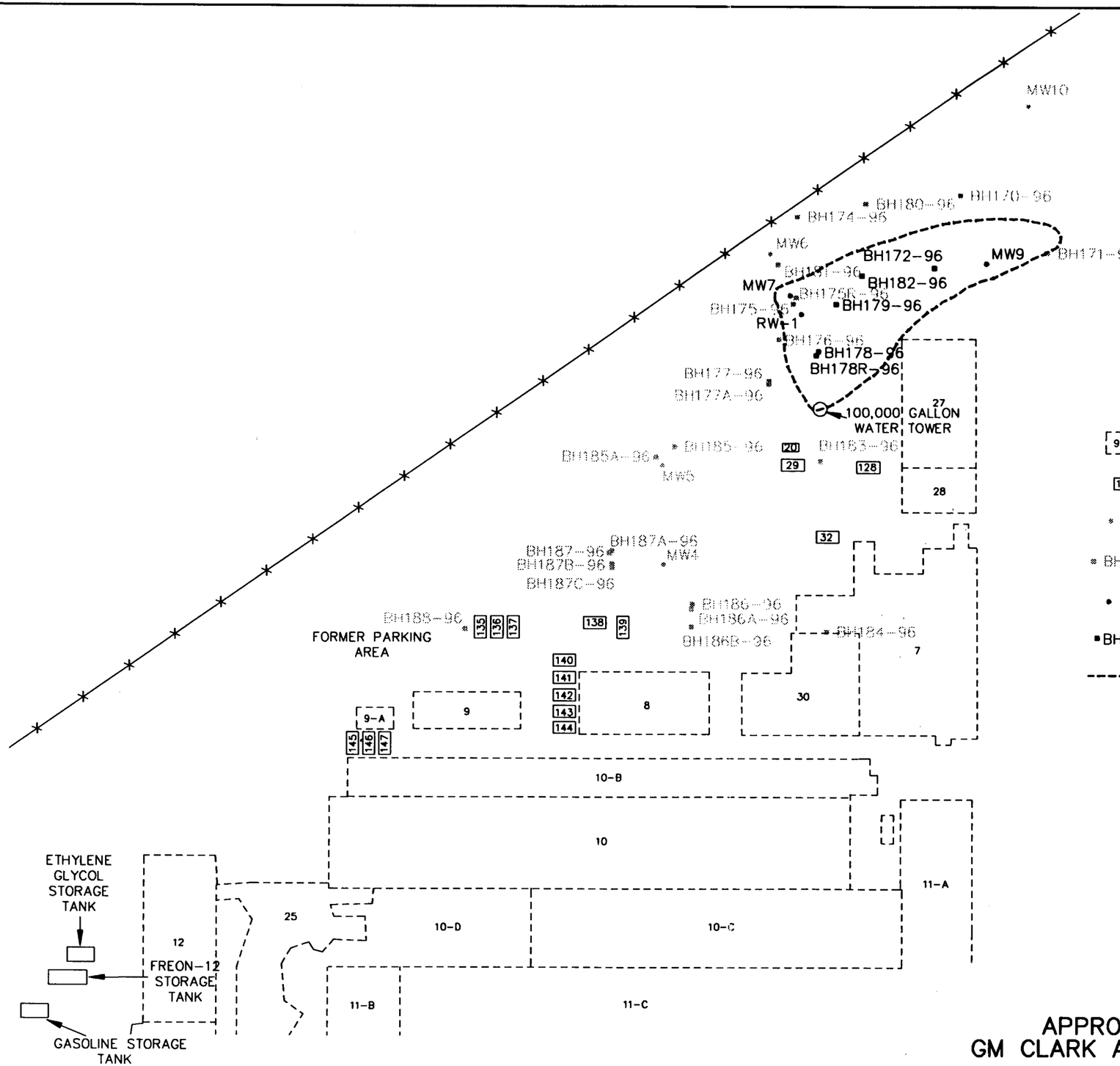
NOTE: BUILDING LOCATIONS ARE NOT SURVEYED

figure 3.2

PHASE III ESA BOREHOLE LOCATIONS
PARCEL A-2
GM CLARK AVENUE FACILITY
Detroit, Michigan

CRA

08889(024)DE002



LEGEND

9-A	DEMOLISHED GM BUILDING IDENTIFICATION NUMBER
138	APPROXIMATE HISTORIC UST LOCATION
* MW6	MONITORING WELL LOCATION
* BH173-96	BOREHOLE LOCATION
• MW9	MONITORING WELL LOCATION WITH OBSERVED FREE PRODUCT
▪BH179-96	BOREHOLE LOCATION WITH OBSERVED FREE PRODUCT
---------	APPROXIMATE EXTENT OF IMPACTED SOILS

NOTE: BUILDING LOCATIONS ARE NOT SURVEYED

figure 6.1

APPROXIMATE EXTENT OF IMPACTED SOIL
GM CLARK AVENUE FACILITY–NORTH ROADWAY
Detroit, Michigan

CRA

08889(024)DE003

TABLE 3.1

SAMPLE SUMMARY
PHASE III ENVIRONMENTAL SITE ASSESSMENT
PARCEL A-2
GM CLARK AVENUE FACILITY
DETROIT, MICHIGAN

Sample Number	*Sample Location*	*PAOC Number*	*Analysis*	*Depth (feet bgs)*
S-8889-101696-PFR-255	BH-170-96	A2-1	BTEX	6-7
S-8889-101696-PFR-256	BH-170-96	A2-1	BTEX	6-7 (Dup.)
S-8889-101696-PFR-257	BH-170-96	A2-1	BTEX	11-12
S-8889-101696-PFR-258	BH-171-96	A2-1	BTEX	5.5-6.5
S-8889-101696-PFR-259	BH-171-96	A2-1	BTEX	8.5-9
S-8889-101696-PFR-260	BH-172-96	A2-1	BTEX	6.5-7
S-8889-101696-PFR-261	BH-172-96	A2-1	BTEX	10.5-11
S-8889-101696-PFR-262	BH-173-96	A2-1	BTEX	6-7
S-8889-101696-PFR-263	BH-173-96	A2-1	BTEX	11-12
S-8889-101796-PFR-264	BH-174-96	A2-1	BTEX	11-12
S-8889-101796-PFR-265	BH-174-96	A2-1	BTEX	15.5-16
S-8889-101796-PFR-267	BH-175-96	A2-1	BTEX	13-14
S-8889-101796-PFR-268	BH-176-96	A2-1	BTEX	4-5
S-8889-101796-PFR-269	BH-1746-96	A2-1	BTEX	10.5-11
S-8889-101796-PFR-271	BH-177-96	A2-1	BTEX	9-11
S-8889-101796-PFR-272	BH-177A-96	A2-1	BTEX	3.5-4.5
S-8889-101796-PFR-273	BH-177A-96	A2-1	BTEX	7.5-8
S-8889-101796-PFR-275	BH-178-96	A2-1	BTEX	13.5-14
S-8889-101896-PFR-276	BH-179-96	A2-1	BTEX	6-7
S-8889-101896-PFR-277	BH-179-96	A2-1	BTEX	14-15
S-8889-101896-PFR-278	BH-180-96	A2-1	BTEX	3-4
S-8889-101896-PFR-279	BH-180-96	A2-1	BTEX	8-9
S-8889-101896-PFR-280	BH-181-96	A2-1	BTEX	6-7
S-8889-101896-PFR-281	BH-181-96	A2-1	BTEX	10.5-11
S-8889-101896-PFR-282	BH-182-96	A2-1	BTEX	5.5-6.5
S-8889-101896-PFR-283	BH-182-96	A2-1	BTEX	5.5-6.5 (Dup.)
S-8889-101896-PFR-284	BH-182-96	A2-1	BTEX	10.5-11.5
S-8889-101896-PFR-285	BH-183-96	A2-1	BTEX	3-4
S-8889-101896-PFR-286	BH-183-96	A2-1	BTEX	8.5-9
S-8889-102196-PFR-287	BH-184-96	A2-1	BTEX	5.5.75
S-8889-102196-PFR-288	BH-184-96	A2-1	BTEX	9.75-11
S-8889-102196-PFR-289	BH-186B-96	A2-1	BTEX	5-6
S-8889-102196-PFR-290	BH-186B-96	A2-1	BTEX	11-12
S-8889-102296-PFR-291	BH-185A-96	A2-1	BTEX	8-10
S-8889-102296-PFR-292	BH-185A-96	A2-1	BTEX	25-27
S-8889-102296-PFR-293	BH-187C-96	A2-1	BTEX	4-5
S-8889-102296-PFR-294	BH-187C-96	A2-1	BTEX	9.5-10
S-8889-102296-PFR-295	BH-188-96	A2-1	BTEX	3-5
S-8889-102296-PFR-296	BH-188-96	A2-1	BTEX	11.5-12
S-8889-102296-PFR-297	BH-175R-96	A2-1	BTEX	5-7
S-8889-102296-PFR-298	BH-175R-96	A2-1	BTEX	11.5-12
S-8889-102296-PFR-299	BH-178R-96	A2-1	BTEX	6-7
S-8889-102296-PFR-308	BH-178R-96	A2-1	BTEX	6-7 (Dup.)
S-8889-102296-PFR-309	BH-178R-96	A2-1	BTEX	13.5-14

Notes:

BTEX = Benzene, Toluene, Ethylbenzene, and Total Xylenes
Dup. = Duplicate
bgs = below ground surface

TABLE 5.1

SUMMARY OF DETECTED BTEX IN SOIL SAMPLES
PHASE III ESA
PARCEL A-2
GM CLARK AVENUE FACILITY
DETROIT, MICHIGAN

AOC No. *Sample Location* *Sample ID (S-8889-)* *Sample Depth (feet bgs)* *Date Sampled*	*Michigan Generic Residential Direct Contact Criteria (1)*	*Michigan Generic Industrial Direct Contact Criteria (2)*	*A2-1* *BH-170-96* *101696-PFR-255* *6-7* *10/16/96*	*A2-1* *BH-170-96* *101696-PFR-256* *6-7 (Dup.)* *10/16/96*	*A2-1* *BH-170-96* *101696-PFR-257* *11-12* *10/16/96*	*A2-1* *BH-171-96* *101696-PFR-258* *5.5-6.5* *10/16/96*	*A2-1* *BH-171-96* *101696-PFR-259* *8.5-9* *10/16/96*	*A2-1* *BH-172-96* *101696-PFR-260* *6.5-7* *10/16/96*
Parameter (ug/kg)								
Benzene	88,000	850,000	4,700 J	3,200 J	ND(10)	ND(10)	ND(10) UJ	160 J
Ethylbenzene	11,000,000	75,000,000	24,000 J	21,000 J	ND(10)	ND(10)	ND(10) UJ	1,100 J
Toluene	24,000,000	160,000,000	32,000 J	25,000 J	ND(10)	ND(10)	ND(10) UJ	220 J
Total Xylenes	200,000,000	1,000,000,000	95,000 J	86,000 J	ND(30)	ND(30)	ND(30) UJ	3,200 J

Notes:

ND( ) - Parameter was not detected above level in parenthesis.
J - The associated numerical value is an estimated quantity.
UJ - The compound was analyzed for but not detected. The sample quantitation limit is an estimated value.
R - The results are rejected due to deficiencies in the ability to analyze the sample.
bgs - below ground surface.
AOC - Area of Concern.
(1) Values taken from MDEQ Operational Memorandum #8, Revision 4, dated June 5, 1995.
(2) Values taken from MDEQ Operational Memorandum #14, Revision 2, dated June 6, 1995.

TABLE 5.1

SUMMARY OF DETECTED BTEX IN SOIL SAMPLES
PHASE III ESA
PARCEL A-2
GM CLARK AVENUE FACILITY
DETROIT, MICHIGAN

AOC No. *Sample Location* *Sample ID (S-8889-)* *Sample Depth (feet bgs)* *Date Sampled*	*Michigan Generic Residential Direct Contact Criteria (1)*	*Michigan Generic Industrial Direct Contact Criteria (2)*	*A2-1* *BH-172-96* *101696-PFR-261* *10.5-11* *10/16/96*	*A2-1* *BH-173-96* *101696-PFR-262* *6-7* *10/16/96*	*A2-1* *BH-173-96* *101696-PFR-263* *11-12* *10/16/96*	*A2-1* *BH-174-96* *101796-PFR-264* *11-12* *10/17/96*	*A2-1* *BH-174-96* *101796-PFR-265* *15.5-16* *10/17/96*	*A2-1* *BH-175-96* *101796-PFR-267* *13-14* *10/17/96*
Parameter (ug/kg)								
Benzene	88,000	850,000	ND(10) UJ	ND(10) R	ND(10) UJ	ND(12)	ND(13) UJ	ND(12) UJ
Ethylbenzene	11,000,000	75,000,000	ND(10) UJ	ND(10) R	ND(10) UJ	ND(12)	ND(13) UJ	ND(12) UJ
Toluene	24,000,000	160,000,000	ND(10) UJ	ND(10) R	ND(10) UJ	ND(12)	ND(13) UJ	ND(12) UJ
Total Xylenes	200,000,000	1,000,000,000	ND(30) UJ	ND(30) R	ND(30) UJ	ND(36)	ND(39) UJ	ND(36) UJ

Notes:

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J - The associated numerical value is an estimated quantity.
UJ - The compound was analyzed for but not detected. The sample quantitation limit is an estimated value.
R - The results are rejected due to deficiencies in the ability to analyze the sample.
bgs - below ground surface.
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TABLE 5.1

SUMMARY OF DETECTED BTEX IN SOIL SAMPLES
PHASE III ESA
PARCEL A-2
GM CLARK AVENUE FACILITY
DETROIT, MICHIGAN

AOC No. *Sample Location* *Sample ID (S-8889-)* *Sample Depth (feet bgs)* *Date Sampled*	*Michigan Generic Residential Direct Contact Criteria (1)*	*Michigan Generic Industrial Direct Contact Criteria (2)*	*A2-1* *BH-176-96* *101796-PFR-268* *4-5* *10/17/96*	*A2-1* *BH-176-96* *101796-PFR-269* *10.5-11* *10/17/96*	*A2-1* *BH-177-96* *101796-PFR-271* *9-11* *10/17/96*	*A2-1* *BH-177A-96* *101796-PFR-272* *3.5-4.5* *10/17/96*	*A2-1* *BH-177A-96* *101796-PFR-273* *7.5-8* *10/17/96*	*A2-1* *BH-178-96* *101796-PFR-275* *13.5-14* *10/17/96*
Parameter (ug/kg)								
Benzene	88,000	850,000	ND(15)	ND(12)	ND(125)	ND(14)	ND(12)	ND(13) UJ
Ethylbenzene	11,000,000	75,000,000	20 J	ND(12)	460	ND(14)	ND(12)	ND(13) UJ
Toluene	24,000,000	160,000,000	ND(15)	ND(12)	200	ND(14)	ND(12)	ND(13) UJ
Total Xylenes	200,000,000	1,000,000,000	74 J	ND(37)	1,100	ND(42)	ND(37)	ND(39) UJ

Notes:

ND( ) - Parameter was not detected above level in parenthesis.
J - The associated numerical value is an estimated quantity.
UJ - The compound was analyzed for but not detected. The sample quantitation limit is an estimated value.
R - The results are rejected due to deficiencies in the ability to analyze the sample.
bgs - below ground surface.
AOC - Area of Concern.
(1) Values taken from MDEQ Operational Memorandum #8, Revision 4, dated June 5, 1995.
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TABLE 5.1

SUMMARY OF DETECTED BTEX IN SOIL SAMPLES
PHASE III ESA
PARCEL A-2
GM CLARK AVENUE FACILITY
DETROIT, MICHIGAN

AOC No. *Sample Location* *Sample ID (S-8889-)* *Sample Depth (feet bgs)* *Date Sampled*	*Michigan Generic Residential Direct Contact Criteria (1)*	*Michigan Generic Industrial Direct Contact Criteria (2)*	*A2-1* *BH-179-96* *101896-PFR-276* *6-7* *10/18/96*	*A2-1* *BH-179-96* *101896-PFR-277* *14-15* *10/18/96*	*A2-1* *BH-180-96* *101896-PFR-278* *3-4* *10/18/96*	*A2-1* *BH-180-96* *101896-PFR-279* *8-9* *10/18/96*	*A2-1* *BH-181-96* *101896-PFR-280* *6-7* *10/18/96*	*A2-1* *BH-181-96* *101896-PFR-281* *10.5-11* *10/18/96*
Parameter (ug/kg)								
Benzene	88,000	850,000	3,600 J	ND(12)	24	36	ND(13)	ND(12)
Ethylbenzene	11,000,000	75,000,000	6,300 J	ND(12)	ND(10)	ND(12)	ND(13)	ND(12)
Toluene	24,000,000	160,000,000	7,300 J	ND(12)	ND(10)	ND(12)	ND(13)	ND(12)
Total Xylenes	200,000,000	1,000,000,000	13,000 J	ND(36)	ND(30)	38	ND(37)	ND(36)

Notes:

ND( ) - Parameter was not detected above level in parenthesis.
J - The associated numerical value is an estimated quantity.
UJ - The compound was analyzed for but not detected. The sample quantitation limit is an estimated value.
R - The results are rejected due to deficiencies in the ability to analyze the sample.
bgs - below ground surface.
AOC - Area of Concern.
(1) Values taken from MDEQ Operational Memorandum #8, Revision 4, dated June 5, 1995.
(2) Values taken from MDEQ Operational Memorandum #14, Revision 2, dated June 6, 1995.

TABLE 5.1

SUMMARY OF DETECTED BTEX IN SOIL SAMPLES
PHASE III ESA
PARCEL A-2
GM CLARK AVENUE FACILITY
DETROIT, MICHIGAN

AOC No. *Sample Location* *Sample ID (S-8889-)* *Sample Depth (feet bgs)* *Date Sampled*	*Michigan* *Generic Residential* *Direct Contact* *Criteria (1)*	*Michigan* *Generic Industrial* *Direct Contact* *Criteria (2)*	*A2-1* *BH-182-96* *101896-PFR-282* *5.5-6.5* *10/18/96*	*A2-1* *BH-182-96* *101896-PFR-283* *5.5-6.5 (Dup.)* *10/18/96*	*A2-1* *BH-182-96* *101896-PFR-284* *10.5-11.5* *10/18/96*	*A2-1* *BH-183-96* *101896-PFR-285* *3-4* *10/18/96*	*A2-1* *BH-183-96* *101896-PFR-286* *8.5-9* *10/18/96*	*A2-1* *BH-184-96* *102196-PFR-287* *5-5.75* *10/21/96*
Parameter (ug/kg)								
Benzene	88,000	850,000	3,500 J	2,400 J	ND(14) UJ	ND(12) UJ	ND(12) UJ	ND(12) UJ
Ethylbenzene	11,000,000	75,000,000	14,000 J	10,000 J	38 J	ND(12) UJ	ND(12) UJ	ND(12) UJ
Toluene	24,000,000	160,000,000	11,000 J	9,000 J	30 J	ND(12) UJ	ND(12) UJ	ND(12) UJ
Total Xylenes	200,000,000	1,000,000,000	46,000 J	36,000 J	180 J	ND(36) UJ	ND(36) UJ	ND(35) UJ

Notes:

ND( ) - Parameter was not detected above level in parenthesis.
J - The associated numerical value is an estimated quantity.
UJ - The compound was analyzed for but not detected. The sample quantitation limit is an estimated value.
R - The results are rejected due to deficiencies in the ability to analyze the sample.
bgs - below ground surface.
AOC - Area of Concern.
(1) Values taken from MDEQ Operational Memorandum #8, Revision 4, dated June 5, 1995.
(2) Values taken from MDEQ Operational Memorandum #14, Revision 2, dated June 6, 1995.

TABLE 5.1

SUMMARY OF DETECTED BTEX IN SOIL SAMPLES
PHASE III ESA
PARCEL A-2
GM CLARK AVENUE FACILITY
DETROIT, MICHIGAN

AOC No. *Sample Location* *Sample ID (S-8889-)* *Sample Depth (feet bgs)* *Date Sampled*	*Michigan Generic Residential Direct Contact Criteria (1)*	*Michigan Generic Industrial Direct Contact Criteria (2)*	*A2-1* *BH-184-96* *102196-PFR-288* *9.75-11* *10/21/96*	*A2-1* *BH-186B-96* *102196-PFR-289* *5-6* *10/21/96*	*A2-1* *BH-186B-96* *102196-PFR-290* *11-12* *10/21/96*	*A2-1* *BH-185A-96* *102296-PFR-291* *8-10* *10/22/96*	*A2-1* *BH-185A-96* *102296-PFR-292* *25-27* *10/22/96*	*A2-1* *BH-187C-96* *102296-PFR-293* *4-5* *10/22/96*
Parameter (µg/kg)								
Benzene	88,000	850,000	ND(12) UJ	ND(150) UJ	ND(12) UJ	ND(12)	ND(12)	ND(11)
Ethylbenzene	11,000,000	75,000,000	ND(12) UJ	470 J	ND(12) UJ	ND(12)	ND(12)	ND(11)
Toluene	24,000,000	160,000,000	ND(12) UJ	280 J	ND(12) UJ	ND(12)	ND(12)	ND(11)
Total Xylenes	200,000,000	1,000,000,000	ND(35) UJ	1,200 J	ND(35) UJ	ND(37)	ND(36)	ND(30)

Notes:

ND( ) - Parameter was not detected above level in parenthesis.
J - The associated numerical value is an estimated quantity.
UJ - The compound was analyzed for but not detected. The sample quantitation limit is an estimated value.
R - The results are rejected due to deficiencies in the ability to analyze the sample.
bgs - below ground surface.
AOC - Area of Concern.
(1) Values taken from MDEQ Operational Memorandum #8, Revision 4, dated June 5, 1995.
(2) Values taken from MDEQ Operational Memorandum #14, Revision 2, dated June 6, 1995.

TABLE 5.1

SUMMARY OF DETECTED BTEX IN SOIL SAMPLES
PHASE III ESA
PARCEL A-2
GM CLARK AVENUE FACILITY
DETROIT, MICHIGAN

AOC No. *Sample Location* *Sample ID (S-8889-)* *Sample Depth (feet bgs)* *Date Sampled*	*Michigan Generic Residential Direct Contact Criteria (1)*	*Michigan Generic Industrial Direct Contact Criteria (2)*	*A2-1* *BH-187C-96* *102296-PFR-294* *9.5-10* *10/22/96*	*A2-1* *BH-188-96* *102296-PFR-295* *3-5* *10/22/96*	*A2-1* *BH-188-96* *102296-PFR-296* *11.5-12* *10/22/96*	*A2-1* *BH-175R-96* *102296-PFR-297* *5-7* *10/22/96*	*A2-1* *BH-175R-96* *102296-PFR-298* *11.5-12* *10/22/96*	*A2-1* *BH-178R-96* *102296-PFR-299* *6-7* *10/22/96*
Parameter (ug/kg)								
Benzene	88,000	850,000	ND(13)	ND(290)	54	600 J	ND(12) UJ	ND(160) J
Ethylbenzene	11,000,000	75,000,000	ND(13)	3,600 J	ND(13)	1,500 J	ND(12) UJ	320 UJ
Toluene	24,000,000	160,000,000	ND(13)	4,300 J	32	890 J	ND(12) UJ	210 UJ
Total Xylenes	200,000,000	1,000,000,000	ND(39)	13,000 J	25	3,300 J	ND(36) UJ	1,100 UJ

Notes:

ND( ) - Parameter was not detected above level in parenthesis.
J - The associated numerical value is an estimated quantity.
UJ - The compound was analyzed for but not detected. The sample quantitation limit is an estimated value.
R - The results are rejected due to deficiencies in the ability to analyze the sample.
bgs - below ground surface.
AOC - Area of Concern.
(1) Values taken from MDEQ Operational Memorandum #8, Revision 4, dated June 5, 1995.
(2) Values taken from MDEQ Operational Memorandum #14, Revision 2, dated June 6, 1995.

TABLE 5.1

SUMMARY OF DETECTED BTEX IN SOIL SAMPLES
PHASE III ESA
PARCEL A-2
GM CLARK AVENUE FACILITY
DETROIT, MICHIGAN

AOC No. *Sample Location* *Sample ID (S-8889-)* *Sample Depth (feet bgs)* *Date Sampled*	*Michigan Generic Residential Direct Contact Criteria (1)*	*Michigan Generic Industrial Direct Contact Criteria (2)*	*A2-1* *BH-178R-96* *102296-PFR-308* *6-7 (Dup.)* *10/22/96*	*A2-1* *BH-178R-96* *102296-PFR-309* *13.5-14* *10/22/96*
Parameter (ug/kg)				
Benzene	88,000	850,000	ND(160) UJ	ND(13) UJ
Ethylbenzene	11,000,000	75,000,000	360 J	ND(13) UJ
Toluene	24,000,000	160,000,000	240 J	ND(13) UJ
Total Xylenes	200,000,000	1,000,000,000	1,200 J	ND(38) UJ

Notes:

ND( ) - Parameter was not detected above level in parenthesis.
J - The associated numerical value is an estimated quantity.
UJ - The compound was analyzed for but not detected. The sample quantitation limit is an estimated value.
R - The results are rejected due to deficiencies in the ability to analyze the sample.
bgs - below ground surface.
AOC - Area of Concern.
(1) Values taken from MDEQ Operational Memorandum #8, Revision 4, dated June 5, 1995.
(2) Values taken from MDEQ Operational Memorandum #14, Revision 2, dated June 6, 1995.

APPENDIX A

BOREHOLE STRATIGRAPHIC LOGS

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL157)
Page 1 of 1

PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH170-96
DATE COMPLETED: OCTOBER 16, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	PAVEMENT	-.3					
	CONCRETE	-.6					
-2.5	SP-SAND, medium dense, fine to medium sand, poorly graded, brown, dry		CUTTINGS	1SS		17	15.3
	CONCRETE	-3.0					
	SW-SAND, trace gravel, trace silt, dense, very fine to coarse sand, fine gravel, well graded, black, wet, strong chemical/petroleum odor, dark green vitreous fragments	-4.0	8" Ø BOREHOLE	2SS		49	339.0
-5.0							
				3SS		12	810.0
-7.5	CL-CLAY, little silt, trace sand, stiff, high plasticity, olive green, dry	-7.0					
	- brown			4SS		9	55.3
-10.0							
				5SS		12	4.7
-12.5	END OF HOLE @ 12.0ft BGS	-12.0					
-15.0							
-17.5							
-20.0							
-22.5							
-25.0							
-27.5							
-30.0							
-32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL158)
Page 1 of 1

PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH171-96
DATE COMPLETED: OCTOBER 16, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	PAVEMENT	-.3					
	CONCRETE	-1.3					
-2.5	ML-SILT, little gravel, trace sand, trace clay, soft to firm, low plasticity, very fine to medium sand, fine to medium gravel, well graded, dark green, moist		CUTTINGS	1SS		4	1.3
-5.0			8" Ø BOREHOLE	2SS		3	1.8
		-6.3		3SS		2	1.4
-7.5	CL-CLAY, trace sand, trace silt, medium plasticity, brown, dry			4SS		3	>0.9
		-9.0					
-10.0	END OF HOLE @ 9.0ft BGS						
-12.5							
-15.0							
-17.5							
-20.0							
-22.5							
-25.0							
-27.5							
-30.0							
-32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL159)
Page 1 of 1

PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH172-96
DATE COMPLETED: OCTOBER 16, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	PAVEMENT	-.2					
	CONCRETE	-.5					
2.5	SP-SAND, loose, fine to medium sand, brown, dry	-2.0	CUTTINGS	1SS		4	210.0
5.0	SW-SAND, little gravel, trace silt, loose, very fine to medium sand, fine gravel, well graded, black, moist, strong odor, wood fragments, visible sheen		8" Ø BOREHOLE	2SS		4	132.0
				(3SS)		9	169.0
7.5	- some gravel, wet	-7.6		4SS		6	24.7
	CL-CLAY, little silt, trace sand, firm, low plasticity, fine to coarse sand, brown, dry			(5SS)		7	8.8
10.0	- green			6SS		8	5.9
12.5	END OF HOLE @ 13.0ft BGS	-13.0					
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(DL160)
Page 1 of 1

PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH173-96
DATE COMPLETED: OCTOBER 16, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	CONCRETE	-.8					
2.5	SM/GM-SAND and GRAVEL, little silt, loose, very fine to coarse sand, fine to medium gravel, well graded, dark brown, moist, pieces of wood and opaque green vitreous substance		CUTTINGS	1SS		5	3.4
		-4.0	8" Ø BOREHOLE	2SS		-	3.5
5.0	CONCRETE	-5.5					
7.5	SM-SAND, little silt, loose, very fine to medium sand, poorly graded, black, moist, weakly dilatant			3SS		4	2.2
		-9.3		4SS		4	2.7
10.0	CL-CLAY, little silt, trace sand, firm, medium plasticity, brown, dry			5SS		7	2.4
12.5	END OF HOLE @ 12.0ft BGS	-12.0					
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL161)
Page 1 of 1

PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH174-96
DATE COMPLETED: OCTOBER 17, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
2.5	SW-SAND (FILL), some gravel, trace silt, trace clay, loose, very fine to coarse sand, fine to coarse gravel, well graded, brown, dry		CUTTINGS	1SS		8	0
				2SS		8	0
5.0			8" Ø BOREHOLE	3SS		6	0
		-6.5		4SS		10	0
7.5	ML-SILT, little sand, trace clay, trace gravel, loose, very fine to coarse sand, fine to medium gravel, well graded, gray, dry	-7.0		5SS		12	0
10.0	SP-SAND, medium dense, fine to medium sand, poorly graded, brown, dry - wet, weakly dilatant			6SS		5	0
12.5		-13.2		7SS		1	0
15.0	CL-CLAY, some silt, trace sand, very soft, high plasticity, olive green, gray, moist - little silt, brown			8SS		5	0
		-16.0					
17.5	END OF HOLE @ 16.0ft BGS						
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL162)
Page 1 of 1

PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH175-96
DATE COMPLETED: OCTOBER 17, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	SW-SAND (FILL), little gravel, trace silt, medium dense, fine to coarse sand, fine to medium gravel, well graded, light brown, dry	-1.3		1SS		13	0
-2.5	GP-GRAVEL, little sand, medium dense, medium to coarse sand, fine gravel, poorly graded, gray brown, dry	-1.7	CUTTINGS				
	CONCRETE, wires and pvc	-4.0	8" Ø BOREHOLE	2SS		13	66.3
-5.0	SW-SAND, little gravel, trace silt, medium dense, very fine to coarse sand, fine to medium gravel, well graded, black, moist, strong odor, green opaque vitreous fragments			3SS		22	94.9
-7.5		-7.8					
	CL-CLAY, trace silt, firm, low plasticity, brown, dry, weak odor			4SS		6	13.3
-10.0				5SS		5	19.5
-12.5				(6SS)		8	2.9
	END OF HOLE @ 14.0ft BGS	-14.0					
-15.0							
-17.5							
-20.0							
-22.5							
-25.0							
-27.5							
-30.0							
-32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(DL199)
Page 1 of 1

PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH175R-96
DATE COMPLETED: OCTOBER 22, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	No sample						
-2.5		-3.0	CUTTINGS				
	SW-SAND, trace gravel, trace silt, medium dense, very fine to coarse sand, fine to medium gravel, well graded, brown, moist	-4.0		1SS		12	45.9
-5.0	SM-SAND, little silt, trace gravel, medium dense, very fine to coarse sand, fine gravel, well graded, black, moist, moderate odor	-6.3		2SS		8	79.3
-7.5	SW-SAND, trace silt, loose, very fine to coarse sand, dark brown, moist		8" Ø BOREHOLE				
	No samples						
-10.0	CL-CLAY, little silt, firm, high plasticity, brown, moist	-10.0		3SS		7	5.2
-12.5				4SS		12	4.3
	END OF HOLE @ 14.0ft BGS	-14.0					
-15.0							
-17.5							
-20.0							
-22.5							
-25.0							
-27.5							
-30.0							
-32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(OL163)
Page 1 of 1

PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH176-96
DATE COMPLETED: OCTOBER 17, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	SM-SAND, trace gravel, little silt, dense, very fine to coarse sand, fine gravel, well graded, light brown, dry	-1.0	CUTTINGS	1SS		30	0
-2.5	CONCRETE	-3.0					
	SW-SAND, trace gravel, medium dense, fine to coarse sand, fine gravel, black, dry		8" Ø BOREHOLE	2SS		22	31.3
-5.0				3SS		31	5.9
-7.5	SM-SAND, little silt, loose, very fine to medium sand, black, moist	-7.2		4SS		3	0
	- wood	-9.2					
-10.0	CL-CLAY, trace sand, trace silt, firm, high plasticity, olive green, moist to dry			5SS		4	0
	END OF HOLE @ 11.0ft BGS	-11.0					
-12.5							
-15.0							
-17.5							
-20.0							
-22.5							
-25.0							
-27.5							
-30.0							
-32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL164)
Page 1 of 1

PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH177-96
DATE COMPLETED: OCTOBER 17, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	PAVEMENT	-.3					
-2.5	SP-SAND, dense, medium to coarse sand, poorly graded, green gray, dry, sulphorous odor		CUTTINGS	1SS		46	7.9
-5.0			8" Ø BOREHOLE	2SS		58	1.9
-7.5	- wet			3SS		33	1.1
				4SS		45	4.6
		-9.3		5SS		5	66.4
-10.0	SW-SAND, trace gravel, loose, fine to coarse sand, fine gravel, well graded, black, wet, strong odor			6SS		6	36.8
-12.5	Refusal, rusty fragments in spoon			7SS		-	2.2
	END OF HOLE @ 14.0ft BGS	-14.0					
-15.0							
-17.5							
-20.0							
-22.5							
-25.0							
-27.5							
-30.0							
-32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(DL165)
Page 1 of 1

PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH177A-96
DATE COMPLETED: OCTOBER 17, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	PAVEMENT	-.3					
	SW-SAND, trace silt, trace gravel, medium dense, very fine to coarse sand, fine to coarse gravel, red brown, dry, black vitreous fragments		CUTTINGS	1SS		25	0.9
-2.5				2SS		-	1.2
-5.0			8" Ø BOREHOLE	3SS		9	0.6
	CL-CLAY, little silt, soft to firm, high plasticity, brown, dry	-5.5					
-7.5				4SS		4	0.4
	END OF HOLE @ 8.0ft BGS	-8.0					
-10.0							
-12.5							
-15.0							
-17.5							
-20.0							
-22.5							
-25.0							
-27.5							
-30.0							
-32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH178-96
DATE COMPLETED: OCTOBER 17, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	PAVEMENT	-.3		1SS		8	1.7
2.5	SM-SAND, little gravel, little silt, loose, very fine to coarse sand, fine to medium gravel, well graded, olive green, moist		CUTTINGS	2SS		3	45.3
5.0			8" Ø BOREHOLE	3SS		3	12.7
	- visible sheen, strong odor, black staining			4SS		3	83.7
7.5				5SS		2	16.1
10.0		-10.5		6SS		–	8.8
	CL-CLAY, trace silt, stiff, high plasticity, gray, dry			(7SS)		11	1.3
12.5							
	END OF HOLE @ 14.0ft BGS	-14.0					
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH178R-96
DATE COMPLETED: OCTOBER 22, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	No samples						
-2.5			CUTTINGS				
-5.0	SM-SAND, little silt, trace clay, trace gravel, loose, very fine to coarse sand, well graded, olive-green, moist, faint sheen	-5.0		1SS		4	22.4
-7.5			8" Ø BOREHOLE	2SS		2	21.0
-10.0							
-12.5	CL-CLAY, trace silt, trace sand, firm, high plasticity, brown, dry	-12.0		3SS		6	0.4
	- gray	-14.0					
-15.0	END OF HOLE @ 14.0ft BGS						
-17.5							
-20.0							
-22.5							
-25.0							
-27.5							
-30.0							
-32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH179-96
DATE COMPLETED: OCTOBER 18, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	ASPHALT	-.2					
	CONCRETE	-.8					
2.5	SW-SAND, trace gravel, medium dense, fine to coarse sand, fine gravel, well graded, brown, dry	-2.7					
5.0	SM-SAND, little silt, trace clay, medium dense, very fine to coarse sand, well graded, black, moist, sheen		CUTTINGS; 8" Ø BOREHOLE	1SS		11	27.4
				2SS		6	24.3
				3SS		3	102.0
7.5				4SS		7	18.6
	- wood fragments	-9.2					
10.0	CL-CLAY, trace silt, firm, high plasticity, gray brown, moist			5SS		4	10.2
				6SS		7	30.2
12.5				7SS		13	3.9
15.0							
	END OF HOLE @ 16.0ft BGS	-16.0					
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(DL168)
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PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH180-96
DATE COMPLETED: OCTOBER 18, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	ASPHALT	-.3		1SS		>35	2.0
	SP-SAND, dense, fine to medium sand, poorly graded, brown, dry	-1.5	CUTTINGS				
2.5	CONCRETE	-3.0					
	SP-SAND, trace gravel, medium dense, medium to coarse sand, fine gravel, poorly graded, brown, moist	-3.5	8" Ø BOREHOLE	2SS		11	11.4
5.0	ML-SILT, little sand, trace clay, medium dense, very fine to fine sand, low plasticity, weakly dilatant, olive green, moist			3SS		11	0
	CL-CLAY, little silt, firm, high plasticity, gray brown, dry	-6.8		4SS		6	0
7.5							
	END OF HOLE @ 9.0ft BGS	-9.0					
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

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PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH181-96
DATE COMPLETED: OCTOBER 18, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	ASPHALT	-.3					
-2.5	SW-SAND, trace gravel, trace silt, medium dense, very fine to coarse sand, fine gravel, well graded, light brown, dry		CUTTINGS	1SS		25	0
-5.0			8" Ø BOREHOLE	2SS		13	0
	SM-SAND, little silt, loose, very fine to medium sand, dark brown, moist	-5.8		3SS		6	1.7
-7.5	ML-SILT, little clay, soft, low plasticity, light brown gray, moist	-7.7		4SS		3	0.2
	CL-CLAY, trace silt, stiff, low plasticity, light brown, dry	-9.0		5SS		9	0
-10.0	END OF HOLE @ 11.0ft BGS	-11.0					
-12.5							
-15.0							
-17.5							
-20.0							
-22.5							
-25.0							
-27.5							
-30.0							
-32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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Page 1 of 1

PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH182-96
DATE COMPLETED: OCTOBER 18, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	CONCRETE	-1.5	CUTTINGS				
2.5	SM-SAND, little silt, trace gravel, medium dense, very fine to coarse sand, fine gravel, well graded, black, moist, strong odor, sheen		8" Ø BOREHOLE	1SS		15	20.0
5.0				2SS		25	265.0
	CL-CLAY, little silt, firm, high plasticity, olive green, moist	-6.0		3SS		5	0.6
7.5				4SS		3	4.2
10.0	- brown			5SS		5	0.9
12.5	END OF HOLE @ 12.0ft BGS	-12.0					
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

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PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH183-96
DATE COMPLETED: OCTOBER 18, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	ASPHALT	-.4					
-2.5	SW-SAND, trace gravel, trace silt, loose, very fine to coarse sand, fine to medium gravel, well graded, black, dry	-2.1	CUTTINGS	1SS		5	3.4
	SM-SAND, little silt, trace clay, loose, very fine to medium sand, well graded, olive green, moist		8" ø BOREHOLE	2SS		7	9.1
-5.0				3SS		5	0.7
	ML-SILT, trace sand, trace clay, firm, low plasticity, olive green, moist	-5.8					
-7.5	- brown			4SS		6	0
	END OF HOLE @ 9.0ft BGS	-9.0					
-10.0							
-12.5							
-15.0							
-17.5							
-20.0							
-22.5							
-25.0							
-27.5							
-30.0							
-32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH184-96
DATE COMPLETED: OCTOBER 21, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	ASPHALT	-.3					
	CONCRETE	-1.0					
	SP-SAND, medium dense, fine to medium sand, poorly graded, light brown, dry	-1.4		1SS		19	0.4
2.5			CUTTINGS				
	SW-SAND, trace gravel, trace silt, medium dense, very fine to coarse sand, fine to medium gravel, well graded, black with yellow staining, moist, glass fragments, bolts			2SS		5	1.5
5.0				3SS		6	1.5
	CL-CLAY, little silt, trace sand, soft to firm, high plasticity, olive-green, moist	-5.8					
7.5			8" Ø BOREHOLE	4SS		4	0.4
10.0		-9.8		5SS		8	0.3
	CL-CLAY, little gravel, trace sand, trace silt, firm to stiff, high plasticity, fine to medium sand, fine gravel, brown, dry, mottled orange staining	-11.0					
12.5	END OF HOLE @ 11.0ft BGS						
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL203)
Page 1 of 1

PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH185-96
DATE COMPLETED: OCTOBER 21, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	ASPHALT	-.3		1SS		44	0
	SW-SAND, little gravel, trace silt, dense, very fine to coarse sand, fine to medium gravel, well graded, gray, dry	-1.7					
-2.5	SP-SAND, trace silt, medium dense, very fine to medium sand, light brown, moist, weakly dilatant		CUTTINGS	2SS		17	0.9
-5.0	- wet			3SS		3	0.9
-7.5			8" Ø BOREHOLE	4SS		5	2.1
				5SS		3	1.4
-10.0				6SS		1	0.1
-12.5				7SS		5	0
-15.0				8SS		2	0.3
				9SS		5	0.4
-17.5							
	- trace coarse gravel			10SS		5	0.6
-20.0	- black staining						
	- concrete	-20.6		11SS		21	0.6
-22.5	SW-SAND, trace gravel, medium dense, fine to coarse sand, fine gravel, light brown, wet, coal fragments			12SS		5	0
-25.0				13SS		20	0
	END OF HOLE @ 26.0ft BGS	-28.0					
-27.5							
-30.0							
-32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH185A-96
DATE COMPLETED: OCTOBER 22, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	ASPHALT	-.3					
	SW-SAND, trace gravel, trace silt, medium dense, very fine to medium sand, fine gravel, well graded, light brown, dry, some black staining			1SS		9	3.8
2.5				2SS		22	5.1
5.0			CUTTINGS	3SS		10	4.2
	- concrete and wood, moist			4SS		57	3.5
7.5							
	- trace clay, weak odor			5SS		4	7.5
10.0				6SS		12	8.8
12.5	- little pea gravel, no visible black staining			7SS		9	3.1
15.0			8" Ø BOREHOLE	8SS		17	1.1
	Difficult drilling, attempted to drill past heaving sands			9SS		13	0.9
17.5							
20.0							
22.5							
25.0	GW-GRAVEL (FILL), little sand, medium dense, fine pea gravel, coarse sand, well graded, predominantly igneous pebbles, wet	-25.0		10SS		10	0
		-27.0					
27.5	END OF HOLE @ 27.0ft BGS						
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

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PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH186-96
DATE COMPLETED: OCTOBER 21, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	ASPHALT	-.3	CUTTINGS	1SS		18	0
-2.5	SW-SAND, trace gravel, medium dense, fine to coarse sand, fine to medium gravel, light brown, dry		8" Ø BOREHOLE	2SS		-	0.6
	Refusal on concrete and metal, augers deflect >40° angle	-3.0					
-5.0	END OF HOLE @ 3.0ft BGS						
-7.5							
-10.0							
-12.5							
-15.0							
-17.5							
-20.0							
-22.5							
-25.0							
-27.5							
-30.0							
-32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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Page 1 of 1

PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH186A-96
DATE COMPLETED: OCTOBER 21, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	ASPHALT	-.3		1SS		15	0
	SW-SAND, trace gravel, medium dense, fine to coarse sand, fine to medium gravel, light brown, dry		CUTTINGS				
-2.5				2SS		-	0.1
	CONCRETE	-3.0					
		-4.0					
-5.0	SM-SAND, little silt, trace gravel, medium dense, very fine to medium sand, fine gravel, well graded, black, moist		8" Ø BOREHOLE	3SS		-	3.4
		-5.5					
	CONCRETE						
		-7.0					
-7.5	SM-SAND, little silt, medium dense, very fine to medium sand, well graded, black, wet	-7.5		4SS		-	0.8
	CONCRETE and METAL	-9.0					
	Refusal on concrete and metal						
-10.0	END OF HOLE @ 9.0ft BGS						
-12.5							
-15.0							
-17.5							
-20.0							
-22.5							
-25.0							
-27.5							
-30.0							
-32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

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PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH186B-96
DATE COMPLETED: OCTOBER 21, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	ASPHALT	-.4					
	SW-SAND, medium dense, fine to coarse sand, well graded, light brown, dry			1SS		18	0.2
-2.5	WOOD, CONCRETE and BRICKS	-2.3	CUTTINGS	2SS		45	2.3
	SW-SAND, trace silt, trace gravel, medium dense, fine to medium sand, fine gravel, well graded, black, moist, strong odor	-4.3					
-5.0			8" Ø BOREHOLE	3SS		14	33.2
	WOOD, CONCRETE and BRICKS	-6.0					
-7.5							
-10.0	CL-CLAY, trace silt, trace sand, firm to stiff, high plasticity, brown, dry	-9.5		4SS		8	0.6
-12.5	- gray			5SS		9	
	END OF HOLE @ 14.0ft BGS	-14.0					
-15.0							
-17.5							
-20.0							
-22.5							
-25.0							
-27.5							
-30.0							
-32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

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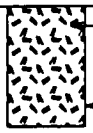
PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH187-96
DATE COMPLETED: OCTOBER 22, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
-2.5	SW-SAND, trace gravel, trace silt, medium dense, very fine to medium sand, fine gravel, well graded, brown, dry		 CUTTINGS; 8" Ø BOREHOLE	ISS		14	0.2
	END OF HOLE @ 3.0ft BGS	-3.0					
-5.0							
-7.5							
-10.0							
-12.5							
-15.0							
-17.5							
-20.0							
-22.5							
-25.0							
-27.5							
-30.0							
-32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE: REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

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PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH187A-96
DATE COMPLETED: OCTOBER 22, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	ASPHALT	-.3					
2.5	SW-SAND, trace gravel, medium dense, fine to coarse sand, fine to medium gravel, well graded, brown, dry, concrete fragments and coal pieces		CUTTINGS	1SS		22	0
5.0			8" Ø BOREHOLE	2SS		17	1.4
	Broke teeth off bit			3SS		–	0.9
	END OF HOLE @ 6.0ft BGS	-6.0					
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL193)
Page 1 of 1

PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH187B-96
DATE COMPLETED: OCTOBER 22, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	ASPHALT	-.3	CUTTINGS	ISS		27	0.9
2.5	SW-SAND, trace gravel, medium dense, fine to coarse sand, fine to medium gravel, well graded, brown, dry, some orange staining		8" Ø BOREHOLE				
	- reinforced concrete	-3.0					
	END OF HOLE @ 3.0ft BGS						
5.0							
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL194)
Page 1 of 1

PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH187C-96
DATE COMPLETED: OCTOBER 22, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	No sample						
		-2.0	CUTTINGS				
2.5	SM-SAND, little silt, medium dense, very fine to medium sand, poorly graded, black, moist			1SS		18	6.1
	- yellow-brown			2SS		6	12.4
5.0			8" Ø BOREHOLE				
		-5.8		3SS		6	6.4
	CL-CLAY, little silt, firm, low plasticity, brown-green, dry						
7.5				4SS		5	3.3
10.0		-10.0					
	END OF HOLE @ 10.0ft BGS						
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL198)
Page 1 of 1

PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH188-96
DATE COMPLETED: OCTOBER 22, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	ASPHALT	-.3		1SS		50	3.2
	SW-SAND, little gravel, trace silt, very dense, fine to coarse sand, fine to medium gravel, well graded, gray-brown, moist	-1.3					
2.5	SM-SAND, trace gravel, little silt, loose, very fine to coarse sand, fine gravel, well graded, black, moist, strong odor		CUTTINGS	2SS		20	245.0
5.0				3SS		8	222.0
	CL-CLAY, little silt, trace sand, firm, low plasticity, fine sand, olive-green, dry, strong odor	-5.8		4SS		6	79.9
7.5			8" Ø BOREHOLE	5SS		6	57.4
10.0	- gray-brown, no odor			6SS		6	2.5
	END OF HOLE @ 12.0ft BGS	-12.0					
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

APPENDIX B

CHAIN-OF-CUSTODY FORMS

CRA

CONESTOGA-ROVERS & ASSOCIATES, INC.
11100 Metro Airport Center Drive - Suite 160
Romulus, MI 48174 (313) 942-0909

CHAIN OF CUSTODY RECORD

SHIPPED TO (Laboratory Name): IEA

REFERENCE NUMBER: 9889-20

PROJECT NAME: GM - Clark Str.

SAMPLER'S SIGNATURE: Patrick Rummel PRINTED NAME:

SEQ: No.	DATE	TIME		SAMPLE TYPE	No. OF CONTAINERS	Michigan Metals	VOC's	TCL SVOC's	PCB's	BTEX	REMARKS
1	Oct. 16/96	900	S-9889-101696-PER-247	Soil	2	✓	✓	✓	✓		
2		930	S- 248		2	✓	✓	✓	✓		
3		900	S- 249		2	✓	✓	✓	✓		72 hrs TAT.
4		900	S- 250		2	✓	✓	✓	✓		
5		1000	S- 251		2	✓	✓	✓	✓		
6		1000	S- 252		2	✓	✓	✓	✓		MS/MSD
7		1100	S- 253		2	✓	✓	✓	✓		
8		1100	S- 254		2	✓	✓	✓	✓		
9		1200	S- 255		1					✓	
10		1200	S- 256		1					✓	
11		1300	S- 257		1					✓	
12		1300	S- 258		1					✓	
13		1400	S- 259		1					✓	
14	↓	1400	S- 260	↓	1					✓	
TOTAL NUMBER OF CONTAINERS											

RELINQUISHED BY: 1. Patrick Rummel	DATE: Oct. 16/96 TIME: 1900	RECEIVED BY: 1.	DATE: TIME:
RELINQUISHED BY: 2.	DATE: TIME:	RECEIVED BY: 2.	DATE: TIME:
RELINQUISHED BY: 3.	DATE: TIME:	RECEIVED BY: 1.	DATE: TIME:

METHOD OF SHIPMENT: Fedex. AIR BILL No. 1805-132 ROP 1805-133 ROP

White - Fully Executed Copy; Yellow - Receiving Laboratory Copy; Pink - Shipper Copy; Goldenrod - Sampler Copy

No. 3657

SAMPLE TEAM: Patrick Rummel

RECEIVED FOR LABORATORY BY:

DATE: 10/17/96 TIME: 0930

4°C

1001 (FORMS)-APRIL 29, 93-REV.0-(C)(F-01)

CRA

CONESTOGA-ROVERS & ASSOCIATES, INC.
11100 Metro Airport Center Drive - Suite 160
Romulus, MI 48174 (313) 942-0909

CHAIN OF CUSTODY RECORD

SHIPPED TO (Lab ry Name): IEA

REFERENCE NUMBER: 9889-20

PROJECT NAME: Gm - Clark St.

SAMPLER'S SIGNATURE: Patrick Rummel PRINTED NAME: _____

SEQ: No.	DATE	TIME		SAMPLE TYPE	No. OF CONTAINERS	PARAMETERS: BTEX	REMARKS
15	Oct.16/96	1500	S-9889-101696-PFR-261	Soil	1	✓	
16	"	1500	S- " - " - 262	"	1	✓	72 hrs TAT.
17	"	1600	S- " - " - 263	"	1	✓	
			TOTAL NUMBER OF CONTAINERS				

RELINQUISHED BY: 1. Patrick Rummel	DATE: Oct.16/96 TIME: 1900	RECEIVED BY: 1. _____	DATE: TIME:
RELINQUISHED BY: 2. _____	DATE: TIME:	RECEIVED BY: 2. _____	DATE: TIME:
RELINQUISHED BY: 3. _____	DATE: TIME:	RECEIVED BY: 1. _____	DATE: TIME:

METHOD OF SHIPMENT: Fedex. AIR BILL No.

White - Fully Executed Copy; Yellow - Receiving Laboratory Copy; Pink - Shipper Copy; Goldenrod - Sampler Copy

No 3658

SAMPLE TEAM: Patrick Rummel.

RECEIVED FOR LABORATORY BY: _____ DATE: 10/17/96 TIME: 0530

4°C

1001 (FORMS)-APRIL 29, 93-REV.0-(C)(F-01)

CRA
CONESTOGA-ROVERS & ASSOCIATES, INC.
11100 Metro Airport Center Drive - Suite 160
Romulus, MI 48174 (313) 942-0909

CHAIN OF CUSTODY RECORD

SHIPPED TO (Laboratory Name): IEA

REFERENCE NUMBER: 8889-20

PROJECT NAME: GM - Clark St.

SAMPLER'S SIGNATURE: Patrick Rummel PRINTED NAME: _____

SEQ: No.	DATE	TIME		SAMPLE TYPE	No. OF CONTAINERS	PARAMETERS: BTEX	REMARKS
1	Oct. 17/96	800	S-8889-101796-PFR-264	Soil	1	✓	
2		800	S- 265		1	✓	72 hrs TAT
3		900	S- 266		1	✓	REC. Broken MNS 10/18/96
4		900	S- 267		1	✓	
5		1000	S- 268		1	✓	
6		1000	S- 269		1	✓	
7		1100	S- 270		1	✓	Rec. Broken MNS 10/18/96
8		1100	S- 271		1	✓	
9		1300	S- 272		1	✓	MS/MSD
10		1300	S- 273		1	✓	~~MS/MSD~~
11		1400	S- 274		1	✓	REC Broken MNS 10/18/96
12	↓	1401	S- 275	↓	1	✓	

TOTAL NUMBER OF CONTAINERS

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
1. Patrick Rummel	Oct. 17/96	1800	1.		
2.			2.		
3.			1.		

METHOD OF SHIPMENT: Fedex

AIR BILL No. 1808-134

White -Fully Executed Copy
Yellow -Receiving Laboratory Copy
Pink -Shipper Copy
Goldenrod -Sampler Copy

SAMPLE TEAM: Patrick Rummel

RECEIVED FOR LABORATORY BY: D. McCourt

DATE: 10/18/96 TIME: 0930

6°C

Nº 3659

1001 (FORMS)-APRIL 29, 93-REV.0-(C)(F-01)

CRA
CONESTOGA-ROVERS & ASSOCIATES, INC.
11100 Metro Airport Center Drive - Suite 160
Romulus, MI 48174 (313) 942-0909

CHAIN OF CUSTODY RECORD

SHIPPED TO (Laboratory Name): [illegible]

REFERENCE NUMBER: [illegible]

PROJECT NAME: [illegible]

SAMPLER'S SIGNATURE: [illegible] PRINTED NAME:

SEQ. No.	DATE	TIME		SAMPLE TYPE	No. OF CONTAINERS	PARAMETERS: [illegible]									REMARKS
1	01/18/96	800	S-03359-101896-PER-231	[illegible]	1	✓									
2	↓	800	S- ↓ 232	↓	1	✓									
3		900	S- 233		1	✓									72 hr TAT.
4		900	S- 239		1	✓									
5		1000	S- 240		1	✓									
6		1000	S- 241		1	✓									
7		1100	S- 242		1	✓									
8		1100	S- 243		1	✓									
9		1300	S- 244		1	✓									
10		1300	S- 245		1	✓									
11	↓	1300	S- ↓ 246	↓	1	✓									
			TOTAL NUMBER OF CONTAINERS		11										

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	DATE/TIME
1. Patrick Romand	DATE: 01/18/96 TIME: 1600	1.	DATE: TIME:
2.	DATE: TIME:	2.	DATE: TIME:
3.	DATE: TIME:	1.	DATE: TIME:

METHOD OF SHIPMENT: Fedex

AIR BILL No.

White ·Fully Executed Copy Pink ·Shipper Copy
Yellow ·Receiving Laboratory Copy Goldenrod ·Sampler Copy

3680

SAMPLE TEAM: Patrick Romand

RECEIVED FOR LABORATORY BY:

DATE: TIME:

1001 (FORMS)-APRIL 29, 93-REV.0-(C)(F-01)

1808 - 136R

CRA
CONESTOGA-ROVERS & ASSOCIATES, INC.
11100 Metro Airport Center Drive - Suite 160
Romulus, MI 48174 (313) 942-0909

CHAIN OF CUSTODY RECORD

SHIPPED TO (Laboratory Name): IEA

REFERENCE NUMBER: 3889-20

PROJECT NAME: GM - Clark St.

SAMPLER'S SIGNATURE: Patrick Rummel PRINTED NAME: _____

SEQ: No.	DATE	TIME		SAMPLE TYPE	No. OF CONTAINERS	PARAMETERS: BTEX	REMARKS
1	Oct. 21/96	1100	S-3889-102196-PR2-287	Soil	1	✓	
2	↓	1100	S- ↓ ↓ -288	"	1	✓	72 hr. TAT
3		1600	S- ↓ ↓ -289	"	1	✓	
4	↓	1600	S- ↓ ↓ -290	"	1	✓	

TOTAL NUMBER OF CONTAINERS

RELINQUISHED BY: 1. Patrick Rummel	DATE: Oct. 21/96 TIME: 1800	RECEIVED BY: 1. _____	DATE: TIME:
RELINQUISHED BY: 2. _____	DATE: TIME:	RECEIVED BY: 2. _____	DATE: TIME:
RELINQUISHED BY: 3. _____	DATE: TIME:	RECEIVED BY: 1. _____	DATE: TIME:

METHOD OF SHIPMENT: Fedex AIR BILL No.

White -Fully Executed Copy Pink -Shipper Copy
Yellow -Receiving Laboratory Copy Goldenrod -Sampler Copy

3679

SAMPLE TEAM: _____

RECEIVED FOR LABORATORY BY: _____
DATE: 10/23/96 TIME: 0930 17 °C

1001 (FORMS) APRIL 29, 93 REV 0 (CVE 01)

1808-1318R

CRA

CONESTOGA-ROVERS & ASSOCIATES, INC.
11100 Metro Airport Center Drive - Suite 160
Romulus, MI 48174 (313) 942-0909

CHAIN OF CUSTODY RECORD

SHIPPED TO (Laboratory Name): IEA

REFERENCE NUMBER: 8999.20

PROJECT NAME: GM - Clark St.

SAMPLER'S SIGNATURE: Patrick Rummel   PRINTED NAME:

SEQ. No.	DATE	TIME		SAMPLE TYPE	No. OF CONTAINERS	BTEX	TCL SVOC	Metals	PCB's	REMARKS
	Oct 22/96	800	S-8999-102296-PER 291	Soil	1	✓				
		800	S- 292	↓	1	✓				MS/MSD
		900	S- 293	↓	1	✓				
		900	S- 294	↓	1	✓				72 hrs TAT.
		1000	S- 295	↓	1	✓				
		1000	S- 296	↓	1	✓				
		1100	S- 297	↓	1	✓				
		1100	S- 298	↓	1	✓				
		1100	S- 299	↓	1	✓				
		1200	S- 300	↓	1	✓				
		1300	S- 309	↓	1	✓				
		1300	S- 310	↓	2	X	✓	✓	✓	
		1400	S- 311	↓	2	X	✓	✓	✓	
		1400								

TOTAL NUMBER OF CONTAINERS: 15

RELINQUISHED BY:	DATE / TIME	RECEIVED BY:	DATE / TIME
1. Patrick Rummel	DATE: Oct. 22/96 TIME: 1800	1.	DATE: TIME:
2.	DATE: TIME:	2.	DATE: TIME:
3.	DATE: TIME:	1.	DATE: TIME:

METHOD OF SHIPMENT: Fedex.   AIR BILL No.

White ·Fully Executed Copy   Pink ·Shipper Copy
Yellow ·Receiving Laboratory Copy   Goldenrod ·Sampler Copy

3678

SAMPLE TEAM:

RECEIVED FOR LABORATORY BY: D. McCormick

DATE: 10/23/96 TIME:

17°C

1001 (FORMS) APRIL 22, 93 REV.0 (OVF-04)

APPENDIX C

DATA VALIDATION MEMORANDA

CRA
11100 Metro Airport Center Drive
Suite 160
Romulus, MI 48174
(313) 942-0909

MEMO

TO: Sara Anderson REFERENCE NO: 8889

FROM: Mary Cameron/lr/53/Det. DATE: December 30, 1996

RE: Data Quality Assessment and Validation for Soil Samples Collected from the General Motors Clark Street Site in Detroit, Michigan

---

The following details a quality assessment and validation of the analytical data resulting from the October 16 through October 22, 1996, collection of 44 soil samples from the General Motors Clark Street Site in Detroit, Michigan. The samples identified in Table 1 were analyzed for benzene, toluene, ethylbenzene and xylene (total) (BTEX). Sample analysis was completed at IEA Inc's Cary, North Carolina facility in accordance with Method 8020 from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846 3rd Edition, and Promulgated Updates, November 1986. The quality control criteria used to assess the data were established by the methods and the quality assurance project plan (QAPP).[1]

Holding Time Period and Sample Analysis

The holding time period for BTEX analyses is 14 days from sample collection to completion of analysis. The samples, as indicated by the sample collection, extraction and analysis dates on the chain-of-custody forms and analytical reports provided by IEA, were prepared and analyzed within the required holding time periods.

Method Blank Samples

Contamination of samples contributed by laboratory conditions or procedures was monitored by concurrent preparation and analysis of method blank samples. The method blank samples were reported to be free from detectable levels of target analytes, indicating no laboratory-attributable contamination occurred.

Laboratory Control Sample (LCS)

The laboratory control sample analyses serve as a monitor of the overall performance in all steps of the sample analysis. The LCS percent recoveries were within the laboratory control limits, indicating that an acceptable level of overall performance was achieved.

Surrogate Compound Percent Recoveries (Surrogate Recoveries)

Individual sample performance for the BTEX analyses was monitored by assessing the results of surrogate compound percent recoveries. The sample analyses that violated surrogate

---

[1] Application of quality assurance criteria was consistent with "Draft National Functional Guideline for Organic Data Review," December, 1990, revised June, 1991.

Surrogate Compound Percent Recoveries (Surrogate Recoveries) (Cont'd)

acceptance criteria are identified and qualified in Table 2. The surrogate recovery acceptance criteria was met for the remaining samples.

Matrix Spike/Matrix Spike Duplicate Percent Recoveries

To assess the long term accuracy and precision of the analytical methods on various matrices, matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and the relative percent difference (RPD) of the recoveries were determined. The data were within the acceptance criteria.

Field Quality Assurance/Quality Control

The field quality assurance/quality control consisted of three (3) field duplicate sample sets. Overall precision for the sampling event and laboratory procedures was monitored using the results of the field duplicate sample sets. Table 3 summarizes the results of the detected analytes in the field duplicate sample sets. The data indicate that an adequate level of precision was achieved for the sampling event.

Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision, based on the provided information, and may be used with the qualifications noted.

TABLE 1

SAMPLE IDENTIFICATION NUMBERS
GM CLARK STREET SITE
DETROIT, MICHIGAN

S-8889-101696-PFR-255	S-8889-101896-PFR-280
S-8889-101696-PFR-256	S-8889-101896-PFR-281
S-8889-101696-PFR-257	S-8889-101896-PFR-282
S-8889-101696-PFR-258	S-8889-101896-PFR-283
S-8889-101696-PFR-259	S-8889-101896-PFR-284
S-8889-101696-PFR-260	S-8889-101896-PFR-285
S-8889-101696-PFR-261	S-8889-101896-PFR-286
S-8889-101696-PFR-262	S-8889-102196-PFR-287
S-8889-101696-PFR-263	S-8889-102196-PFR-288
S-8889-101796-PFR-264	S-8889-102196-PFR-289
S-8889-101796-PFR-265	S-8889-102196-PFR-290
S-8889-101796-PFR-267	S-8889-102296-PFR-291
S-8889-101796-PFR-268	S-8889-102296-PFR-292
S-8889-101796-PFR-269	S-8889-102296-PFR-293
S-8889-101796-PFR-271	S-8889-102296-PFR-294
S-8889-101796-PFR-272	S-8889-102296-PFR-295
S-8889-101796-PFR-273	S-8889-102296-PFR-296
S-8889-101796-PFR-275	S-8889-102296-PFR-297
S-8889-101896-PFR-276	S-8889-102296-PFR-298
S-8889-101896-PFR-277	S-8889-102296-PFR-299
S-8889-101896-PFR-278	S-8889-102296-PFR-308
S-8889-101896-PFR-279	S-8889-102296-PFR-309

TABLE 2

SUMMARY OF QUALIFIED SAMPLE DATA DUE TO VIOLATION OF SURROGATE PERCENT RECOVERY CRITERIA GM CLARK STREET SITE DETROIT, MICHIGAN

Analysis	*Associated Samples*	*Qualifier*[1]
BTEX	S-8889-101696-PFR-255	J
	S-8889-101696-PFR-256	J
	S-8889-101696-PFR-259	UJ
	S-8889-101696-PFR-260	J
	S-8889-101696-PFR-261	UJ
	S-8889-101696-PFR-262	R
	S-8889-101696-PFR-263	UJ
	S-8889-101796-PFR-265	UJ
	S-8889-101796-PFR-267	UJ
	S-8889-101796-PFR-268	J
	S-8889-101796-PFR-275	UJ
	S-8889-101896-PFR-276	J
	S-8889-101896-PFR-282	J
	S-8889-101896-PFR-283	J
	S-8889-101896-PFR-284	J/UJ
	S-8889-101896-PFR-285	UJ
	S-8889-101896-PFR-286	UJ
	S-8889-102196-PFR-287	UJ
	S-8889-102196-PFR-288	UJ
	S-8889-102196-PFR-289	J/UJ
	S-8889-102196-PFR-290	UJ
	S-8889-102296-PFR-295	J
	S-8889-102296-PFR-297	J
	S-8889-102296-PFR-298	UJ
	S-8889-102296-PFR-299	J/UJ
	S-8889-102296-PFR-308	J/UJ
	S-8889-102296-PFR-309	UJ

[1] The analysis should be qualified for the listed samples as:

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the samples (for non-detected parameters).

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

TABLE 3

SUMMARY OF DETECTED ANALYTIES IN FIELD DUPLICATE SAMPLE SETS
GM CLARK STREET SITE
DETROIT, MICHIGAN

Parameter (µg/kg)	*Investigative Sample*	*Duplicate Sample*	*RPD*[1]
	S-8889-101696-PFR-255	S-8889-101696-PFR-256	
Benzene	4,700 J[2]	3,200 J	38
Toluene	32,000 J	25,000 J	25
Ethylbenzene	24,000 J	21,000 J	13
Xylenes (total)	95,000 J	86,000 J	10
	S-8889-101896-PFR-282	S-8889-101896-PFR-283	
Benzene	3,500 J	2,400 J	37
Toluene	11,000 J	9,000 J	20
Ethylbenzene	14,000 J	10,000 J	33
Xylenes (total)	46,000 J	36,000 J	24
	S-8889-102296-PFR-299	S-8889-102296-PFR-308	
Ethylbenzene	320 J	360 J	12
Toluene	210 J	240 J	13
Xylenes (total)	1,100 J	1,200 J	9

[1] RPD - Relative Percent Difference

[2] J - Qualified as an estimate value.