REPORT

# *Resource Conservation and Recovery Act Facility Investigation Phase I Report*

## *Volume II of IV*

**General Motors Corporation**
**NAO Flint Operations Site**
**Flint, Michigan**

**June 28, 2002**

BBL®
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

REPORT

# *Resource Conservation and Recovery Act Facility Investigation Phase I Report*

## *Volume II of IV*

**General Motors Corporation**
**NAO Flint Operations Site**
**Flint, Michigan**

**June 28, 2002**

BBL®
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

# Table of Contents

## Volume I


**Acronyms** ..... 1

**Section 1. Introduction** ..... 1-1

1.1 General ..... 1-1
1.2 RFI Objectives ..... 1-2
1.3 Report Organization ..... 1-2

**Section 2. RFI Overview** ..... 2-1

2.1 Site Description and History ..... 2-1
2.2 Pre-RFI Investigations ..... 2-1
2.3 RFI Investigations ..... 2-2
2.3.1 GIS Database and Site Survey ..... 2-2
2.3.2 RFI Sampling and Analysis Program ..... 2-3
2.3.2.1 Boring/Well/Piezometer Installation and Sample Collection ..... 2-3
2.3.2.2 Soil Sample Collection ..... 2-3
2.3.2.3 Groundwater Elevation Measurement and Groundwater Sample Collection ..... 2-4
2.3.2.4 LNAPL Delineation and Sample Collection ..... 2-5
2.4 Interim Measures ..... 2-6
2.4.1 Inactive IMs ..... 2-7
2.4.2 Active IMs ..... 2-9
2.4.3 IMs Under Design ..... 2-10
2.4.4 Other LNAPL Areas Under Consideration ..... 2-11

**Section 3. Environmental Setting** ..... 3-1

3.1 Topography ..... 3-1
3.2 Climate ..... 3-1
3.3 Regional Hydrology ..... 3-1
3.4 Regional Geology ..... 3-2
3.4.1 Overburden ..... 3-2
3.4.2 Bedrock 3-2
3.5 Regional Hydrogeology ..... 3-2
3.6 Surface Water/Drainage ..... 3-3
3.7 Site-Specific Geology ..... 3-3
3.8 Site-Specific Hydrogeology ..... 3-4
3.9 Land Use and Demographics ..... 3-5

**Section 4. Investigation Results and Discussion** ..... 4-1

4.1 Generic Michigan Department of Environmental Quality (MDEQ) Screening Criteria ..... 4-1
4.2 Evaluation of Total Versus Dissolved PAL Inorganics Data ..... 4-2
4.3 Data QA/QC Summary ..... 4-3
4.4 AOIs North of Leith Street ..... 4-3

4.4.1 AOI 38-1 (Process Waste Sumps, Trenches, and Former Hydraulic Car Lifts) .4-4
4.4.1.1 Scope ....4-4
4.4.1.2 Results....4-4
4.4.1.3 Conclusions....4-4
4.4.2 AOI 36-1 (Engine Manufacturing and Metal Machining Processes)....4-5
4.4.2.1 Scope ....4-5
4.4.2.2 Results....4-5
4.4.2.3 Conclusions....4-6
4.4.3 AOI 36-2 (Metal Chip Processing Area)....4-6
4.4.3.1 Scope ....4-6
4.4.3.2 Results....4-7
4.4.3.3 Conclusions....4-7
4.4.4 AOI 36-3 (Engine Assembly, Waste Oil Collection and Processing, Former USTs) ....4-7
4.4.4.1 Scope ....4-8
4.4.4.2 Results....4-8
4.4.4.3 Conclusions....4-8
4.4.5 AOI 36-4 (Former Metal Machining and Active Engine Assembly) ....4-9
4.4.5.1 Scope ....4-9
4.4.5.2 Results....4-9
4.4.5.3 Conclusions....4-9
4.4.6 AOI 36-5 (Former UST Farm and Active AST Farm)....4-9
4.4.6.1 Scope ....4-10
4.4.6.2 Results....4-10
4.4.6.3 Conclusions....4-10
4.4.7 AOI 55-1 (Industrial Wastewater Treatment Facilities)....4-11
4.4.7.1 Scope ....4-11
4.4.7.2 Results....4-11
4.4.7.3 Conclusions....4-12
4.4.8 AOI 10-1 (Manufacturing Operations and Several Tanks)....4-12
4.4.8.1 Scope ....4-12
4.4.8.2 Results....4-12
4.4.8.3 Conclusions....4-13
4.4.9 AOI 10-2 (Solid Waste Transfer Area and Former ASTs) ....4-13
4.4.9.1 Scope ....4-13
4.4.9.2 Results....4-14
4.4.9.3 Conclusions....4-14
4.4.10 AOI 10-3 (Two Process Waste Oil Sumps)....4-14
4.4.10.1 Scope ....4-15
4.4.10.2 Results....4-15
4.4.10.3 Conclusions....4-15
4.4.11 AOI 10-4 (Scrapyard Area) ....4-16
4.4.11.1 Scope ....4-16
4.4.11.2 Results....4-16
4.4.11.3 Conclusions....4-16
4.4.12 AOI 05-1 (Former Metal Machining Chip Processing)....4-17
4.4.12.1 Scope ....4-17
4.4.12.2 Results....4-17
4.4.12.3 Conclusions....4-18
4.4.13 AOI 05-2 (Filtration Room, Oil Room, Below-Grade Vault, and Elevator Pit)...4-18
4.4.13.1 Scope ....4-18
4.4.13.2 Results....4-18
4.4.13.3 Conclusions....4-19

4.4.14 AOI 05-3 (Building 43 Basement Containing Process Waste Oil Sumps and Drains) ....4-19
4.4.14.1 Scope ....4-19
4.4.14.2 Results....4-19
4.4.14.3 Conclusions ....4-20
4.4.15 AOI 05-4 (Metal Forming Operations and Recirculation Trenches and Sumps) ....4-20
4.4.15.1 Scope ....4-20
4.4.15.2 Results....4-20
4.4.15.3 Conclusions ....4-20
4.4.16 AOI 05-5 (Active Process Machinery, Collection Trenches, and Sumps) ....4-21
4.4.16.1 Scope ....4-21
4.4.16.2 Results....4-21
4.4.16.3 Conclusions ....4-21
4.4.17 AOI-05-6 (Active Process Machinery, Collection Trenches, and Sumps) ....4-22
4.4.17.1 Scope ....4-22
4.4.17.2 Results....4-22
4.4.17.3 Conclusions ....4-23
4.4.18 AOI 03-1 (Quenching and Cooling Oil Systems) ....4-23
4.4.18.1 Scope ....4-23
4.4.18.2 Results....4-23
4.4.18.3 Conclusions ....4-24
4.4.19 AOI 81-1 (Metal Machining, Chip, Cooling, and Cutting Oil Filtration and Processing, a Hydraulic Elevator, Process Waste Sumps and Tanks, a Drum Storage Area, and an Active Hazardous Waste Accumulation Area) ....4-24
4.4.19.1 Scope ....4-24
4.4.19.2 Results....4-25
4.4.19.3 Conclusions ....4-25
4.4.20 AOI 81-2 (Active Metal Welding and Machining and Torque Converter Assembly) ....4-25
4.4.20.1 Scope ....4-26
4.4.20.2 Results....4-26
4.4.20.3 Conclusions ....4-26
4.4.21 AOI 81-3 (Former Foundry Operations, an Elevator Pit, Metal Machining Areas, and a Forklift Battery Charging Area) ....4-27
4.4.21.1 Scope ....4-27
4.4.21.2 Results....4-27
4.4.21.3 Conclusions ....4-28
4.4.22 AOI 81-4 (Air Compressor Operations) ....4-28
4.4.22.1 Scope ....4-28
4.4.22.2 Results....4-28
4.4.22.3 Conclusions ....4-29
4.4.23 AOI 81-5 (Existing and Former ASTs) ....4-29
4.4.23.1 Scope ....4-29
4.4.23.2 Results....4-29
4.4.23.3 Conclusions ....4-30
4.4.24 AOI 21-1 (Former Metal Chip Briquetting Operations and Current Metal Welding and Tool Grinding Operations) ....4-30
4.4.24.1 Scope ....4-30
4.4.24.2 Results....4-30
4.4.24.3 Conclusions ....4-31
4.4.25 AOI 65-1 (Air Compressor Station and a Main Process Waste Pump Station) ....4-31

4.4.25.1 Scope ....4-31
4.4.25.2 Results....4-31
4.4.25.3 Conclusions ....4-32
4.4.26 AOI 83/84-1 (Former and Existing Machining Operations)....4-32
4.4.26.1 Scope ....4-32
4.4.26.2 Results....4-32
4.4.26.3 Conclusions ....4-33
4.4.27 AOI 83/84-2 (Former and Existing Machining Operations)....4-33
4.4.27.1 Scope ....4-33
4.4.27.2 Results....4-33
4.4.27.3 Conclusions ....4-34
4.4.28 AOI 83/84-3 (Former and Existing Machining Operations)....4-34
4.4.28.1 Scope ....4-34
4.4.28.2 Results....4-35
4.4.28.3 Conclusions ....4-35
4.4.29 AOI 83/84-4 (Former Machining Operations and an Inactive Rail Loading Area) 4-35
4.4.29.1 Scope ....4-36
4.4.29.2 Results....4-36
4.4.29.3 Conclusions ....4-36
4.4.30 AOI 83/84-5 (Former Process Trenches and Pits, and an Inactive Heat Treating Tunnel) ....4-36
4.4.30.1 Scope ....4-37
4.4.30.2 Results....4-37
4.4.30.3 Conclusions ....4-37
4.4.31 AOI 83/84-6 (Forklift Battery Charging Area and Associated Trench and Pit, and a Drum Storage Area....4-37
4.4.31.1 Scope ....4-38
4.4.31.2 Results....4-38
4.4.31.3 Conclusions ....4-38
4.4.32 AOI 83/84-7 (Underground Storage Tanks)....4-38
4.4.32.1 Scope ....4-38
4.4.32.2 Results....4-39
4.4.32.3 Conclusions ....4-39
4.4.33 AOI 85-1 (Elevator Pit and Engine Test Area)....4-39
4.4.33.1 Scope ....4-39
4.4.33.2 Results....4-40
4.4.33.3 Conclusions ....4-40
4.4.34 AOI 86-1 (Hazardous Waste Drum Accumulation Area, Process Waste Sump and Pump Station, Waste Transport Vehicle Storage Area, and Former USTs) ....4-40
4.4.34.1 Scope ....4-41
4.4.34.2 Results....4-41
4.4.34.3 Conclusions ....4-42
4.4.35 AOI 07-1 (Former Coal Yard)....4-42
4.4.35.1 Scope ....4-42
4.4.35.2 Results....4-42
4.4.35.3 Conclusions ....4-43
4.4.36 AOI 07-2 (Inactive Lime "Slaker House" and Inactive Lime Slurry Tank)....4-43
4.4.36.1 Scope ....4-43
4.4.36.2 Results....4-43
4.4.36.3 Conclusions ....4-44
4.4.37 AOI 07-3 (Two Elevator Pits and a bulk Acid AST) ....4-44
4.4.37.1 Scope ....4-44

4.4.37.2 Results ..... 4-44
4.4.37.3 Conclusions ..... 4-45
4.5 AOIs South of Leith Street ..... 4-45
4.5.1 AOI Group 94-A (Sumps and Trenches in Oil Change Pits and Chemical Storage Areas) ..... 4-45
4.5.1.1 Scope ..... 4-45
4.5.1.2 Results ..... 4-45
4.5.1.3 Conclusions ..... 4-46
4.5.2 AOI Group 94-B (Process Sump and Trench) ..... 4-46
4.5.2.1 Scope ..... 4-46
4.5.2.2 Results ..... 4-46
4.5.2.3 Conclusions ..... 4-46
4.5.3 AOI Group 94-C (Hydraulic Oil Storage Areas) ..... 4-47
4.5.3.1 Scope ..... 4-47
4.5.3.2 Results ..... 4-47
4.5.3.3 Conclusions ..... 4-47
4.5.4 AOI Group 94-D (Pit For a Cable-Operated Car Elevator) ..... 4-48
4.5.4.1 Scope ..... 4-48
4.5.4.2 Results ..... 4-48
4.5.4.3 Conclusions ..... 4-48
4.5.5 AOI Group 94-E (Car-Loading Machinery and Hydraulic Oil Observed on Floor) ..... 4-49
4.5.5.1 Scope ..... 4-49
4.5.5.2 Results ..... 4-49
4.5.5.3 Conclusions ..... 4-49
4.5.6 AOI Group 84-A (Elevator Pits, Sumps, a Machine Shop, Hydraulic Cylinders, and a Hydraulic Lift) ..... 4-49
4.5.6.1 Scope ..... 4-50
4.5.6.2 Results ..... 4-50
4.5.6.3 Conclusions ..... 4-50
4.5.7 AOI Group 84-B (Sumps, Floor Drains, a Pit, a Flooded Basement, and a Below Grade Vault) ..... 4-50
4.5.7.1 Scope ..... 4-51
4.5.7.2 Results ..... 4-51
4.5.7.3 Conclusions ..... 4-51
4.5.8 AOI Group 84-C (Sumps, a Trench, and an Oil/Water Separator Pit) ..... 4-51
4.5.8.1 Scope ..... 4-51
4.5.8.2 Results ..... 4-52
4.5.8.3 Conclusions ..... 4-52
4.5.9 AOI Group 84-D (Former UST Farm, an AST Farm, and Drum Storage Area) ..... 4-52
4.5.9.1 Scope ..... 4-52
4.5.9.2 Results ..... 4-53
4.5.9.3 Conclusions ..... 4-53
4.5.10 AOI Group 17-A (Elevator Pit) ..... 4-53
4.5.10.1 Scope ..... 4-53
4.5.10.2 Results ..... 4-54
4.5.10.3 Conclusions ..... 4-54
4.5.11 AOI Group 02-A (Process Wastewater Sump) ..... 4-54
4.5.11.1 Scope ..... 4-54
4.5.11.2 Results ..... 4-55
4.5.11.3 Conclusions ..... 4-55
4.5.12 AOI Group 02-B (Elevator Pit) ..... 4-55
4.5.12.1 Scope ..... 4-55

4.5.12.2 Results ..... 4-56
4.5.12.3 Conclusions ..... 4-56
4.5.13 AOI Group 02-C (Sump In The Materials Laboratory) ..... 4-56
4.5.13.1 Scope ..... 4-56
4.5.13.2 Results ..... 4-57
4.5.13.3 Conclusions ..... 4-57
4.5.14 AOI Group 02-D (Press Machine Pit) ..... 4-57
4.5.14.1 Scope ..... 4-57
4.5.14.2 Results ..... 4-58
4.5.14.3 Conclusions ..... 4-58
4.5.15 AOI Group 02-E (Former UST) ..... 4-58
4.5.15.1 Scope ..... 4-58
4.5.15.2 Results ..... 4-58
4.5.15.3 Conclusions ..... 4-59
4.5.16 AOI Group 02-F (Hydraulic Oil AST and Pump) ..... 4-59
4.5.16.1 Scope ..... 4-59
4.5.16.2 Results ..... 4-59
4.5.16.3 Conclusions ..... 4-60
4.5.17 AOI Group 23-A (Process Waste Sumps, Dock Levelers, and Basements Used for Heat Treat Process Water) ..... 4-60
4.5.17.1 Scope ..... 4-60
4.5.17.2 Results ..... 4-60
4.5.17.3 Conclusions ..... 4-61
4.5.18 AOI Group 29-A (Elevator Pit and Observed Oil Staining) ..... 4-61
4.5.18.1 Scope ..... 4-61
4.5.18.2 Results ..... 4-61
4.5.18.3 Conclusions ..... 4-62
4.5.19 AOI Group 12-A (Press Pits, Sumps, Trenches, Traps, and Floor Staining) ..... 4-62
4.5.19.1 Scope ..... 4-62
4.5.19.2 Results ..... 4-62
4.5.19.3 Conclusions ..... 4-63
4.5.20 AOI Group 12-B (Truck Loading Dock Drain and Sump) ..... 4-63
4.5.20.1 Scope ..... 4-63
4.5.20.2 Results ..... 4-63
4.5.20.3 Conclusions ..... 4-64
4.5.21 AOI Group 12-C (Sump In Battery Charging Area, Deep Steam Pipe, and a Utility Pit Containing Oil and Water) ..... 4-64
4.5.21.1 Scope ..... 4-64
4.5.21.2 Results ..... 4-64
4.5.21.3 Conclusions ..... 4-65
4.5.22 AOI Group 12-D (Abandoned, Flooded Utility Tunnel) ..... 4-65
4.5.22.1 Scope ..... 4-65
4.5.22.2 Results ..... 4-65
4.5.22.3 Conclusions ..... 4-66
4.5.23 AOI Group 04-A (Process Waste Room and Waste Pit) ..... 4-66
4.5.23.1 Scope ..... 4-66
4.5.23.2 Results ..... 4-66
4.5.23.3 Conclusions ..... 4-67
4.5.24 AOI Group 04-B (Elevator Pits) ..... 4-67
4.5.24.1 Scope ..... 4-67
4.5.24.2 Results ..... 4-67
4.5.24.3 Conclusions ..... 4-68
4.5.25 AOI Group 04-C (Elevator Pit) ..... 4-68
4.5.25.1 Scope ..... 4-68

4.5.25.2 Results ..... 4-68
4.5.25.3 Conclusions ..... 4-69
4.5.26 AOI Group 04-D (Former USTs) ..... 4-69
4.5.26.1 Scope ..... 4-69
4.5.26.2 Results ..... 4-69
4.5.26.3 Conclusions ..... 4-69
4.5.27 AOI Group 16-A (Vehicle Fill-Up Station, Automatic Transmission Pump House, and a Gas Pump Station) ..... 4-70
4.5.27.1 Scope ..... 4-70
4.5.27.2 Results ..... 4-70
4.5.27.3 Conclusions ..... 4-70
4.5.28 AOI Group 16-B (Elevator Pit) ..... 4-71
4.5.28.1 Scope ..... 4-71
4.5.28.2 Results ..... 4-71
4.5.28.3 Conclusions ..... 4-71
4.5.29 AOI Group 16-C (Hydraulic Motor, Former AST, and Former USTs) ..... 4-71
4.5.29.1 Scope ..... 4-72
4.5.29.2 Results ..... 4-72
4.5.29.3 Conclusions ..... 4-72
4.5.30 AOI Group 16-D (Former UST and Process Wastewater Sump) ..... 4-73
4.5.30.1 Scope ..... 4-73
4.5.30.2 Results ..... 4-73
4.5.30.3 Conclusions ..... 4-74
4.5.31 AOI Group 40-A (Former UST Farm) ..... 4-74
4.5.31.1 Scope ..... 4-74
4.5.31.2 Results ..... 4-74
4.5.31.3 Conclusions ..... 4-75
4.5.32 AOI Group 40-B (Elevator Pit) ..... 4-75
4.5.32.1 Scope ..... 4-75
4.5.32.2 Results ..... 4-75
4.5.32.3 Conclusions ..... 4-76
4.5.33 AOI Group 40-C (Elevator Pit) ..... 4-76
4.5.33.1 Scope ..... 4-76
4.5.33.2 Results ..... 4-76
4.5.33.3 Conclusions ..... 4-77
4.5.34 AOI Group 40-D (Flooded Basement/Tunnel Area) ..... 4-77
4.5.34.1 Scope ..... 4-77
4.5.34.2 Results ..... 4-78
4.5.34.3 Conclusions ..... 4-78
4.5.35 AOI Group 44-A (Sumps, Pits, Trenches, Drains, Floor Stains, and ASTs) ..... 4-78
4.5.35.1 Scope ..... 4-78
4.5.35.2 Results ..... 4-79
4.5.35.3 Conclusions ..... 4-79
4.5.36 AOI Group 09-A (Former USTs, Floor Trenches, and Former AST) ..... 4-80
4.5.36.1 Scope ..... 4-80
4.5.36.2 Results ..... 4-80
4.5.36.3 Conclusions ..... 4-81
4.5.37 AOI Group 09-B (Hamilton Avenue Tank Farm) ..... 4-81
4.5.37.1 Scope ..... 4-81
4.5.37.2 Results ..... 4-82
4.5.37.3 Conclusions ..... 4-82
4.6 New AOIs ..... 4-82
4.6.1 Former Aeration Lagoons Area ..... 4-83
4.6.1.1 Scope ..... 4-83

4.6.1.2 Results ..... 4-83
4.6.1.3 Conclusions ..... 4-83
4.6.2 Harriet Street Area (USTs) ..... 4-83
4.6.2.1 Scope ..... 4-84
4.6.2.2 Results ..... 4-84
4.6.2.3 Conclusions ..... 4-84
4.6.3 Former Administration Building Area (Transformer Yard, Soil Stockpile Area, and Former USTs) ..... 4-85
4.6.3.1 Scope ..... 4-85
4.6.3.2 Results ..... 4-85
4.6.3.3 Conclusions ..... 4-86
4.6.4 Former Building 94 Employee Parking Lot ..... 4-86
4.6.4.1 Scope ..... 4-86
4.6.4.2 Results ..... 4-86
4.6.4.3 Conclusions ..... 4-87

**Section 5. Project Status ..... 5-1**

5.1 AOI Investigation Status Summary ..... 5-1
5.1.1 AOIs Requiring No Further Investigation ..... 5-1
5.1.2 AOIs Requiring No Further Investigation of Soil ..... 5-2
5.1.3 AOIs Requiring No Further Investigation of Groundwater ..... 5-3
5.1.4 AOIs Requiring Risk Evaluation ..... 5-4
5.2 Background Soil Data ..... 5-4
5.3 Sitewide Groundwater Quality ..... 5-4
5.3.1 Upgradient Groundwater Quality ..... 5-4
5.3.2 Sitewide Distribution of Constituents in Groundwater at Concentrations Above Generic Screening Criteria ..... 5-5
5.4 Interim Measures Status Summary ..... 5-6

**Section 6. References ..... 6-1**

## Tables

2-1 Soil Boring Inventory and Completion Summary
2-2 Monitoring Well Inventory and Completion Summary
2-3 Soil Sample Collection Summary
2-4 Water Sample Collection Summary
2-5 LNAPL Sample Collection Summary
2-6 Measured LNAPL Thickness Summary
3-1 Geotechnical Data Summary
3-2 Groundwater and LNAPL Elevation Data
5-1 Summary of RFI Activities, Results, and Investigation Status

## Figures (Bound Separately)

2-1 Site Location Map
2-2 Decision Logic Flow Chart for Groundwater Sample Collection
2-3 Site Plan – Northend
2-4 Site Plan – Southend
2-5 Interim Measures and Storm Sewer Location Map - Northend
2-6 Interim Measures and Storm Sewer Location Map - Southend
3-1 Northend Well and Cross-Section Location Map
3-2 Southend Well and Cross-Section Location Map

D Groundwater Analytical Data
Table D-1 Groundwater Sample Collection Field Parameters
Table D-2 Groundwater Analytical Data
Table D-3 MDEQ Part 201 Groundwater Screening Criteria
Table D-4 Notes for Tables
E LNAPL Analytical Data
Table E-1 LNAPL Analytical Data
F Evaluation of Total and Dissolved TAL Data

## Volume IV

G Analytical Data Review and Validation Report Summaries

# *Appendix A*

# Soil Boring and Monitoring Well Logs

BBL®
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

# APPENDIX A
## SOIL BORING AND MONITORING WELL LOGS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 20-101R | RFI-05-08 | RFI-09-15 | RFI-12-07R | RFI-29-03 | RFI-36-44 | RFI-81-12R | RFI-83/84-26 | WL-B4 |
| 20-105R | RFI-05-09 | RFI-09-16 | RFI-12-08 | RFI-36-01 | RFI-36-45 | RFI-81-13 | RFI-83/84-27 | WL-B5 |
| 40-303R | RFI-05-09Geotech | RFI-09-18 | RFI-12-08R | RFI-36-01Geotech | RFI-36-46 | RFI-81-19 | RFI-83/84-27R | WL-B6 |
| 40-4R | RFI-05-10 | RFI-09-19 | RFI-12-09 | RFI-36-02 | RFI-38-01 | RFI-81-20 | RFI-83/84-28 | |
| 40-7R | RFI-05-11 | RFI-09-20 | RFI-12-10 | RFI-36-03 | RFI-38-02 | RFI-81-21 | RFI-83/84-29 | |
| 43-101R | RFI-05-12 | RFI-09-21 | RFI-12-11S | RFI-36-03 | RFI-38-03 | RFI-81-22 | RFI-84-01 | |
| ACSP-B1 | RFI-05-13 | RFI-09-22 | RFI-12-11D | RFI-36-04 | RFI-38-04 | RFI-81-23 | RFI-84-02 | |
| ACSP-B2 | RFI-05-14 | RFI-09-23 | RFI-12-12S | RFI-36-05 | RFI-38-05 | RFI-81-24 | RFI-84-03 | |
| ACSP-B2C | RFI-05-15 | RFI-09-24 | RFI-12-14 | RFI-36-06 | RFI-38-06 | RFI-81-25 | RFI-84-04 | |
| ACSP-B2D | RFI-05-16 | RFI-09-25 | RFI-12-15 | RFI-36-07 | RFI-40-01 | RFI-81-26 | RFI-84-05 | |
| ACSP-B2E | RFI-05-17 | RFI-09-26 | RFI-12-16 | RFI-36-08 | RFI-40-02 | RFI-81-27 | RFI-84-06 | |
| ACSP-B3 | RFI-05-18 | RFI-09-27 | RFI-12-17 | RFI-36-09 | RFI-40-03R | RFI-81-28 | RFI-85-02 | |
| ACSP-B3D | RFI-05-19S | RFI-09-28 | RFI-12-18 | RFI-36-10 | RFI-40-04 | RFI-81-29 | RFI-85-02R | |
| ACSP-B4 | RFI-05-19D | RFI-09-29 | RFI-12-20 | RFI-36-11 | RFI-40-05 | RFI-81-30 | RFI-85-03 | |
| ACSP-B5 | RFI-05-19DR | RFI-10-01 | RFI-12-21 | RFI-36-12 | RFI-40-06 | RFI-81-31 | RFI-85-04 | |
| ACSP-B6 | RFI-05-20 | RFI-10-02 | RFI-12-22 | RFI-36-13 | RFI-40-07 | RFI-81-32 | RFI-85-04R | |
| BD01-01 | RFI-05-21 | RFI-10-03 | RFI-16-01 | RFI-36-14 | RFI-40-08 | RFI-81-33 | RFI-85-05 | |
| BD01-02 | RFI-05-22 | RFI-10-04 | RFI-16-02 | RFI-36-15 | RFI-40-09 | RFI-81-34 | RFI-85-06 | |
| BD01-03 | RFI-05-23 | RFI-10-05 | RFI-16-03 | RFI-36-16 | RFI-40-10 | RFI-81-35 | RFI-85-07 | |
| RFI-02-01 | RFI-05-24 | RFI-10-06 | RFI-16-04 | RFI-36-17 | RFI-44-01 | RFI-83/84-01 | RFI-86-01 | |
| RFI-02-02 | RFI-05-25 | RFI-10-07 | RFI-16-05 | RFI-36-18 | RFI-44-02 | RFI-83/84-02 | RFI-86-01D | |
| RFI-02-03 | RFI-05-27 | RFI-10-08 | RFI-16-06 | RFI-36-19 | RFI-44-03 | RFI-83/84-03 | RFI-86-01R | |
| RFI-02-04 | RFI-05-29 | RFI-10-11 | RFI-16-07 | RFI-36-20 | RFI-44-04 | RFI-83/84-04 | RFI-86-02 | |
| RFI-02-05 | RFI-05-30 | RFI-10-12 | RFI-16-08 | RFI-36-21 | RFI-44-05 | RFI-83/84-05 | RFI-86-03 | |
| RFI-02-06 | RFI-07-01 | RFI-10-13 | RFI-16-09 | RFI-36-22 | RFI-44-06 | RFI-83/84-06 | RFI-86-04 | |
| RFI-02-07 | RFI-07-01R | RFI-10-14 | RFI-16-10 | RFI-36-23 | RFI-44-07 | RFI-83/84-07 | RFI-86-05 | |
| RFI-02-08 | RFI-07-02 | RFI-10-15 | RFI-16-11 | RFI-36-24 | RFI-44-09 | RFI-83/84-08 | RFI-86-06D | |
| RFI-02-09 | RFI-07-03 | RFI-10-16 | RFI-16-12 | RFI-36-25 | RFI-55-01 | RFI-83/84-09 | RFI-86-06S | |
| RFI-02-10 | RFI-07-04 | RFI-10-17 | RFI-16-13 | RFI-36-25R | RFI-55-01Geotech | RFI-83/84-10 | RFI-86-07 | |
| RFI-02-11 | RFI-07-05 | RFI-10-18 | RFI-16-14 | RFI-36-26 | RFI-55-02 | RFI-83/84-11 | RFI-86-08 | |
| RFI-03-01 | RFI-07-06 | RFI-10-19 | RFI-16-15 | RFI-36-27 | RFI-55-03 | RFI-83/84-12 | RFI-86-08R | |
| RFI-03-02 | RFI-07-07 | RFI-10-20 | RFI-16-16 | RFI-36-28 | RFI-55-04 | RFI-83/84-13 | RFI-86-10 | |
| RFI-03-03 | RFI-07-08 | RFI-10-21 | RFI-16-17 | RFI-36-29 | RFI-55-05 | RFI-83/84-14 | RFI-86-11 | |
| RFI-03-04 | RFI-07-09 | RFI-10-22 | RFI-16-18 | RFI-36-29R | RFI-55-06 | RFI-83/84-15 | RFI-86-12 | |
| RFI-03-05 | RFI-09-01 | RFI-10-23 | RFI-16-19 | RFI-36-30 | RFI-55-09 | RFI-83/84-16 | RFI-86-12R | |
| RFI-03-06 | RFI-09-02 | RFI-10-24 | RFI-16-20 | RFI-36-31 | RFI-55-10 | RFI-83/84-17 | RFI-86-13 | |
| RFI-03-07 | RFI-09-03 | RFI-10-25 | RFI-16-21 | RFI-36-32 | RFI-65-01 | RFI-83/84-18 | RFI-86-14 | |
| RFI-03-08 | RFI-09-04 | RFI-10-26 | RFI-16-22 | RFI-36-33 | RFI-81-01 | RFI-83/84-19 | RFI-86-15 | |
| RFI-04-01 | RFI-09-04R | RFI-10-27 | RFI-16-23 | RFI-36-34 | RFI-81-02 | RFI-83/84-20 | RFI-94-01 | |
| RFI-04-02 | RFI-09-05 | RFI-12-01 | RFI-17-01 | RFI-36-35 | RFI-81-03 | RFI-83/84-21 | RFI-94-02 | |
| RFI-04-03 | RFI-09-06 | RFI-12-01R | RFI-17-02 | RFI-36-36 | RFI-81-04 | RFI-83/84-22 | RFI-94-03 | |
| RFI-04-04 | RFI-09-07 | RFI-12-02 | RFI-21-01 | RFI-36-36R | RFI-81-05 | RFI-83/84-23 | RFI-94-04 | |
| RFI-05-01 | RFI-09-08 | RFI-12-03 | RFI-21-02 | RFI-36-37 | RFI-81-06 | RFI-83/84-24 | RFI-94-05 | |
| RFI-05-02 | RFI-09-09 | RFI-12-04 | RFI-21-03 | RFI-36-38 | RFI-81-07 | RFI-83/84-25 | RFI-94-06 | |
| RFI-05-03 | RFI-09-10 | RFI-12-05 | RFI-21-04 | RFI-36-39 | RFI-81-08 | | RFI-EP94-02A | |
| RFI-05-04 | RFI-09-11 | RFI-12-06 | RFI-23-01 | RFI-36-40 | RFI-81-09 | | RFI-EP94-02B | |
| RFI-05-05 | RFI-09-12 | RFI-12-07 | RFI-23-02 | RFI-36-41 | RFI-81-10 | | WL-B1 | |
| RFI-05-06 | RFI-09-13 | | RFI-29-01 | RFI-36-42 | RFI-81-11 | | WL-B2 | |
| RFI-05-07 | RFI-09-14 | | RFI-29-02 | RFI-36-43 | RFI-81-12 | | WL-B3 | |

## LOG ABBREVIATION LEGEND

## GENERAL MOTORS CORPORATION
## NAO FLINT OPERATION SITE
## FLINT, MICHIGAN

-/+ = Negative/Positive Oil/Water Shake Test Result.
ags = above ground surface.
bgs = below ground surface.
CN = Clear NAPL.
HSA = Hollow Stem Auger.
ID = Inner Diameter.
NA = Not Applicable/Not Available.
pp = pocket penetrometer measurement (tons/square foot).
SS = Split Spoon.
WH/WOH = Weight of Hammer.

USCS = Unified Soil Classification System.

GW = Well-graded gravels, gravel-sand mixtures, little or no fines.
GP = Poorly-graded gravels, gravel-sand mixtures, little or no fines.
GM = Silty gravels, gravel-sand mixtures.
GC = Clayey gravels, gravel-sand-clay mixtures.
SW = Well-graded sands, gravelly sands, little or no fines.
SC = Clayey sands, sand-silt mixtures.
ML = Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts, with slight plasticity.
CL = Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
OL = Organic silts and organic silty clays of low plasticity.
MH = Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
CH = Inorganic clay of high plasticity, fat clays.
OH = Organic clay of medium to high plasticity, organic silts.

# GEOLOGIC SYMBOL KEY

## GENERAL MOTORS CORPORATION
## NAO FLINT OPERATION SITE
## FLINT, MICHIGAN

| DEPTH | ELEVATION | Geologic Column | Stratigraphic Description |
|---|---|---|---|
| 0 | 0 | | ASPHALT |
| | | | FILL |
| | | | WOOD |
| | | | CONCRETE |
| | | | Coarse SAND |
| 5 | 5 | | Medium SAND |
| | | | Fine (fine to medium) SAND |
| | | | SAND and SILT |
| | | | GRAVEL and SAND |
| | | | Fine GRAVEL |
| 10 | 10 | | Medium to Coarse GRAVEL |
| | | | SILT |
| | | | SILTY SAND |
| | | | SAND and SILT |
| | | | SILTY CLAY |
| 15 | 15 | | CLAY |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:**

Project:
Data File:Key.dat

Template: J:\Rockware\LogPlot 2001\LogFiles\64410\Key.ldf
Date: 6/26/02

# GEOLOGIC SYMBOL KEY

## GENERAL MOTORS CORPORATION
## NAO FLINT OPERATION SITE
## FLINT, MICHIGAN

| DEPTH / ELEVATION | Geologic Column | Stratigraphic Description |
|---|---|---|
| | | CLAY and SILT |
| | | CLAY and SAND |
| | | CLAYEY SILT |
| | | COAL |
| 20 20 | | PEAT |
| 25 25 | | |
| 30 30 | | |
| 35 35 | | |

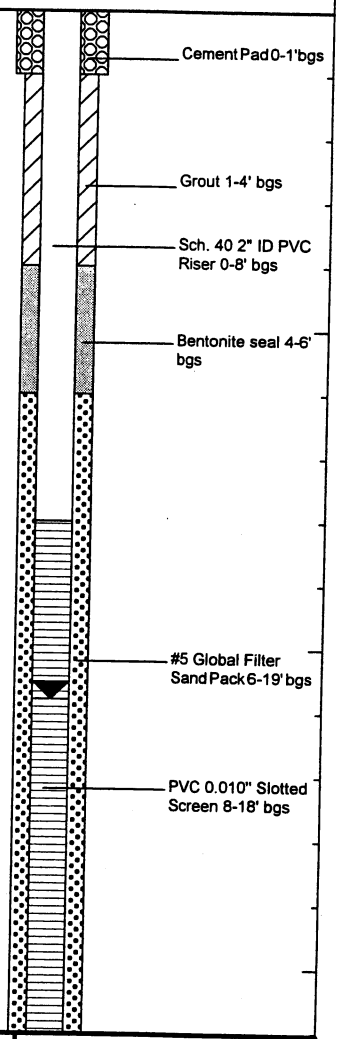
BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:**

| | | |
|---|---|---|
| **Date Start/Finish:** 11/5/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 85 | **Northing:** 566784.36<br>**Easting:** 13306492.88<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 751.69<br><br>**Descriptions By:** SM Duly | **Boring ID:** 20-101R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 1 | 0-1.2 | 2 4 | 4 | 1.2 | 0.0 | - | ML | | Very dark gray (10YR 3/1) SILT, trace fine Sand, Clay, roots and organic matter (topsoil), earthy odor, moderately loose, moist. | SILT |
| | 750 | | NA | NA | NA | NA | NA | - | FL | | Concrete. | FILL |
| | | 2 | 3-5 | 7 7 6 4 | 13 | 1.5 | 0.0 | - | ML | | Very dark gray (10YR 3/1) SILT, trace fine Sand, Clay, roots and organic matter (old topsoil), earthy odor, moderately loose, moist. | SILT |
| | | | | | | | | | | | Dark grayish brown (10YR 4/2) SILT, some Clay, trace fine Sand, no odor, loose, moist, some local oxidation. | |
| 5 | | 3 | 5-7 | 8 5 6 5 | 11 | 1.7 | 0.0 | - | | | Very dark gray (10YR 3/1) SILT, trace fine to medium Sand, trace Clay, no odor, dense, aplastic, moist to wet. | |
| | | | | | | | | | SW | | Brown (10YR 4/3) fine to coarse well graded SAND, some Silt and Clay, predominantly fine grained, no odor, moist. | |
| | 745 | | | | | | | | ML | | Gray (10YR 5/1) Clayey SILT, trace fine Sand, moderately loose, somewhat plastic, moist. | SILT |
| | | 4 | 7-9 | 2 2 3 4 | 5 | 1.7 | 0.0 | - | CL | | Gray (10YR 5/1) CLAY, some Silt, trace fine Sand, no odor, plastic, damp. | CLAY |
| 10 | | 5 | 9-11 | 2 2 3 8 | 5 | 2 | 0.0 | - | ML | | Gray (10YR 5/1) SILT, trace Clay and fine Sand, no odor, moderately loose, moist to wet.<br>10.2' 10.7' bgs: Mottled (10YR 5/4) yellow-brown SILT.<br>Saturated at 10.8' bgs, no Sand or Clay, loose. | SILT |
| | 740 | 6 | 11-13 | 3 5 9 10 | 14 | 1.5 | 0.0 | - | | | | |
| | | 7 | 13-15 | 3 4 6 5 | 10 | 1.3 | 0.0 | - | | | | |
| 15 | | 8 | 15-17 | 3 4 | 9 | 1.7 | 0.0 | - | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected at 0-1.2' and 7-9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** 20-101R

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | 8 | 15-17 | 5 7 | 9 | 1.7 | 0.0 | - | ML | | Gray (10YR 5/1) SILT, trace Clay and fine Sand, no odor, moderately loose, moist to wet. | SILT | #5 Global Filter Sand Pack 6-19' bgs |
| | | 9 | 17-19 | 2 3 3 8 | 6 | 0.9 | 0.0 | - | | | | | PVC 0.010" Slot Screen 8-18' bgs |
| 20 | | | | | | | | | | | | | PVC Cap 18.0-18.2' bgs |
| | 730 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected at 0-1.2' and 7-9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 08/17/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** ACSP-B3D<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-2 | 6<br>3<br>NA<br>NA | NA | 0.8 | 12.4 | - | SM | | Very dark gray-brown (10 YR 3/2) Silty fine to coarse subrounded SAND, few to little fine to coarse angular gravel, few clay, earthy odor, moderately loose to moderately dense, damp with rainfall, organic matter. Topsoil. | FILL | |
| | | | | | | | | | FILL | | Reinforced in-situ concrete slabs and metallic debris, cinders. | | |
| 5 | 5 | 2 | 4-6 | 4<br>7<br>9<br>11 | 16 | 1.0 | 11.7 | - | | | Silty SAND as at 0-0.8' bgs, no odor, no organic matter, dry. Mixed with concrete debris and cinders. Fill. | SAND and SILT | |
| | | 3 | 6-8 | 3<br>5<br>21<br>NA | 26 | 1.0 | 17.7 | - | SM | | | | Borehole tremie grouted. |
| | | | | | | | | | FILL | | Reinforced concrete. | FILL | |
| 10 | 10 | 4 | 10-12 | 11<br>20<br>21<br>38 | 41 | 1.9 | 0.0 | + | ML | | Very pale brown SILT, some fine subangular to subrounded Sand, trace Clay, dense, no odor, aplastic, dry to damp. | SILT | |
| | | 5 | 12-14 | 21<br>35<br>50/.0<br>0 | NA | 1.2 | 2.8 | - | SM | | Very pale brown SILTY fine to medium subangular to subrounded SAND, trace to few clay, aplastic, very dense, no odor, damp. | SAND and SILT | |
| 15 | 15 | 6 | 14-16 | 11<br>17<br>31<br>42 | 48 | 1.6 | 0.0 | - | ML | | Yellow-brown (10 YR 5/4) SILT, little Clay, no odor, aplastic, very dense, damp.<br>Saturated, 5" thick Silty SAND seam, as at 12-14' bgs. | SILT | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available.
Samples collected at 0-2', 5-7', 7-9', 10-12' and 12-14' bgs

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/17/01 | 15.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 10/26/00-10/26/00<br>**Drilling Company:** RAU Drilling<br>**Driller's Name:** Rick Rau<br>**Drilling Method:** Hollow Stem Auger<br>**Bit Size:** NA<br>**Auger Size:** 3.25" ID<br>**Rig Type:** CME 45 B Truck Mounted Dill Rig<br>**Sampling Method:** 2" spoon | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 738.9'<br><br>**Geologist:** R Wagner | **Well/Boring ID:** ACSP-B4<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Phase II ESA<br>AC Sparkplug Property |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N-Values | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | |
| 0 | | 1 | 0-2 | 0.9 | 4, 17, 14, 15 | 31 | 23.5 | | | Dark brown fine to medium SAND, some coarse Sand, little Cinders and Silt. [FILL] | |
| | 735 | 2 | 2-4 | 1.1 | 11, 22, 11, 50 | 33 | 19.9 | | | Brown medium to coarse SAND, some fine Sand and Silt, little Concrete and Cinders, moist. [FILL] | |
| 5 | | 3 | 4-6 | 1.8 | 9, 11, 13, 18 | 24 | 25.2 | | | Brown SILT, some medium to coarse Sand and fine Gravel, little Concrete and Cinders, moist. [FILL] | Borehole backfilled with Bentonite chips. |
| | | 4 | 6-8 | 1.9 | 9, 18, 28, 29 | 46 | 25.9 | | | Light brown fine SAND, little Silt and coarse Sand, compact, moist. | |
| | 730 | 5 | 8-10 | 2.0 | 11, 16, 19, 22 | 45 | 31.4 | X | | As above, moist, compact. | |
| 10 | | 7 | 10-12 | 2.0 | 7, 14, 21, 22 | 35 | 25.9 | | | Light brown SILT, some fine Sand, moist, compact. | |
| | | 8 | 12-14 | 2.0 | 8, 15, 23, 29 | 38 | 26.6 | | | Light brown fine SAND, little Silt, compact, moist. | |
| | 725 | | | | | | | | | | |
| 15 | | 9 | 14-16 | 1.8 | 7, 8, 7, 11 | 15 | 12.4 | | | Light brown SILT, some fine Sand grading to gray Silt, trace fine Sand, moist. | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** No temporary well installed at this location.
Sample ACSP-B4 (8-10') submitted for VOCs & Metals (Mich. 10) analysis. Borehole terminated at 16'.

| | | |
|---|---|---|
| **Date Start/Finish:** 10/26/00-10/26/00<br>**Drilling Company:** RAU Drilling<br>**Driller's Name:** Rick Rau<br>**Drilling Method:** Hollow Stem Auger<br>**Bit Size:** NA<br>**Auger Size:** 3.25" ID<br>**Rig Type:** CME 45 B Truck Mounted Dill Rig<br>**Sampling Method:** 2' x 2" ID | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** 733'<br><br>**Geologist:** R Wagner | **Well/Boring ID:** ACSP-B5<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Phase II ESA<br>AC Sparkplug Property |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N-Values | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | | | | | | | | | | |
| 0 | | | | | | | | | | | |
| | | 1 | 0-2 | 1.7 | 6, 10, 11, 13 | 21 | 18 | | | Brown to black fine SAND, and misc. FILL material. [FILL] | |
| | 730 | 2 | 2-4 | 1.8 | 11, 12, 11, 11 | 23 | 7.3 | | | As above, moist. | |
| 5 | | 3 | 4-6 | 2.0 | 5, 5, 8, 7 | 13 | 34.5 | | | Brown SILT, little medium to coarse Sand, Brick and Concrete fragments, tracae fine Sand. [FILL] | Borehole backfilled with Bentonite chips. |
| | 725 | 4 | 6-8 | 2.0 | 5, 13, 24, 29 | 37 | 55.5 | | | As above, compact. | |
| 10 | | 5 | 8-10 | 1.9 | 10, 20, 26, 30 | 46 | 44.6 | | | Brown medium to coarse Sandy SILT, very compact, dry. | |
| | | 7 | 10-12 | 1.9 | 11, 22, 27, 33 | 49 | 49.1 | | | Brown SILT and fine SAND, compact, dry. | |
| | 720 | 8 | 12-14 | 1.9 | 18, 30, 36, 30 | 66 | 58.6 | X | | As above, compact, dry. | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** No temporary well installed at this location.
Sample ACSP-B5 (12-14') submitted for VOCs & Metals (Mich. 10) analysis. MS/MSD submitted for Metals (Mich. 10).
Borehole terminated at 14'.

| | | |
|---|---|---|
| **Date Start/Finish:** 10/27/00-10/27/00<br>**Drilling Company:** RAU Drilling<br>**Driller's Name:** Rick Rau<br>**Drilling Method:** Hollow Stem Auger<br>**Bit Size:** NA<br>**Auger Size:** 3.25" ID<br>**Rig Type:** CME 45 B Truck Mounted Dill Rig<br>**Sampling Method:** 2" spoon | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' below grade<br>**Surface Elevation:** 735.6'<br><br>**Geologist:** Raymond Wagner | **Well/Boring ID:** ACSP-B6<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Phase II ESA<br>AC Sparkplug Property |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N-Values | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 735 | 1 | 0-2 | 0.7 | 8 25 50/ 0.0 | - | 31.7 | | | Black SILT, Brick and Concrete fragments. [FILL] | |
| | | 2 | 2-4 | 1.5 | 2 2 2 2 | 4 | 46.8 | X | | Brown SILT and fine SAND, some medium to coarse Sand, little coarse Gravel and Concrete, loose, moist. [FILL] | |
| 5 | 730 | 3 | 4-6 | 1.3 | 2 2 2 2 | 4 | 9.3 | | | Brown fine Silty SAND (SM), trace medium to coarse Sand, loose, moist. | Borehole backfilled with Bentonite chips. |
| | | 4 | 6-8 | 1.6 | 2 2 3 3 | 5 | 27.1 | | | Light brown fine SAND (SM), little Silt, loose, moist. | |
| | | 5 | 8-10 | 1.8 | 3 3 3 4 | 6 | 13.3 | | | As above, loose, moist. | |
| 10 | 725 | 7 | 10-12 | 1.9 | 4 5 6 9 | 11 | 24.2 | | | As above, loose to firm, moist. | |
| | | 8 | 12-14 | 2.0 | 8 10 12 13 | 22 | 24.7 | | | As above, firm, moist. | |
| 15 | 720 | 9 | 14-16 | 2.0 | 9 12 13 13 | 25 | 2.1 | | | Brown SILT (ML), some fine Sand, firm, moist. | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** No temporary well installed at this location.
Sample ACSP-B6 (2-4') submitted for VOCs & Metals (Mich. 10) analysis. Borehole terminated at 18'.

**Client:**
General Motors

**Site Location:**
GM-Flint - Phase II ESA
AC Sparkplug Property

**Well/Boring ID:** ACSP-B6

**Borehole Depth:** 18' below grade

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N - Value | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 16-18 | 2.0 | 10<br>13<br>16<br>18 | 29 | 21.2 | | | As above, compact, moist to wet. | Borehole backfilled with Bentonite chips. |
| 20 | 715 | | | | | | | | | | |
| 25 | 710 | | | | | | | | | | |
| 30 | 705 | | | | | | | | | | |
| 35 | 700 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** No temporary well installed at this location.
Sample ACSP-B6 (2-4') submitted for VOCs & Metals (Mich. 10) analysis. Borehole terminated at 18'.

| | | |
|---|---|---|
| **Date Start/Finish:** 12/03/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 28' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** BD01-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | ASPHALT. | | |
| | | 1 | 0-2 | 6 3 2 2 | 5 | 1.0 | 0.0 | - | ML | | Brown (10YR 5/3) SILT, some fine to coarse grained subangular Sand, little Clay, little fine to coarse grained angular Gravel (aggregate), no odor, moderately dense, aplastic, damp. Fill. | SILT | |
| | | 2 | 2-4 | 2 2 4 5 | 6 | 1.8 | 0.0 | - | | | Yellow-brown (10YR 5/4) Silty CLAY, little fine to coarse subrounded to subangular Sand, few fine to medium rounded Gravel, no odor, moderately stiff, aplastic, damp to moist. Clay Till. | SILTY CLAY | |
| 5 | 5 | 3 | 4-6 | 6 6 7 7 | 13 | 1.8 | 0.0 | - | | | Occasional Silty lenses up to 2.5" thick, moist to wet.<br>Dry, increased stiffness. | | |
| | | 4 | 6-8 | 6 9 14 20 | 23 | 1.3 | 0.0 | - | | | | | 2" ID PVC Riser 0-21' bgs<br>Grout 0-18' bgs |
| | | 5 | 8-10 | 6 12 13 16 | 25 | 2.0 | 0.0 | - | CL | | Little medium to coarse Gravel. Occasionally fossiliferous Gravel. | | |
| 10 | 10 | 6 | 10-12 | 2 10 13 17 | 23 | 1.0 | 0.0 | - | | | | | |
| | | 7 | 12-14 | 9 13 10 14 | 23 | 1.7 | 0.0 | - | | | | | |
| 15 | 15 | 8 | 14-16 | 9 13 20 22 | 33 | 2.0 | 0.0 | - | SW<br>ML | | Yellow-brown (10YR 5/4) aplastic well-graded fine to coarse grained subrounded to subangular SAND, some Silt, trace Clay, no odor, dense, damp. Fill Sand.<br>Brown (10YR 5/3) aplastic SILT, little Clay, no odor, dense, damp. Coarsens downward to a Sand. | SILT | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 12/03/01 | 24.5' bgs | |

**Client:**
General Motors

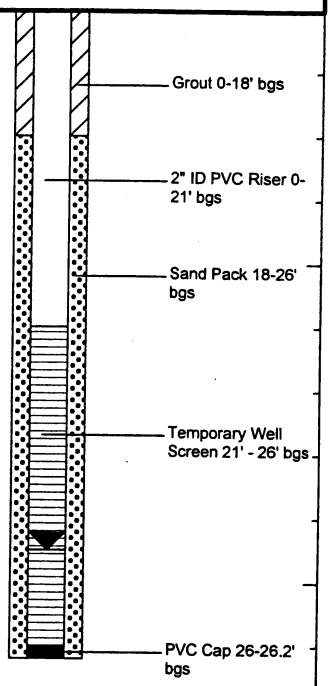
**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** BD01-01

**Borehole Depth:** 28' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 7 14 24 25 | 38 | 1.5 | 0.0 | - | ML | Brown (10YR 5/3) aplastic SILT, little Clay, no odor, dense, damp. Coarsens downward to a Sand. | SILT |
| | | 10 | 18-20 | 9 15 50/4" | 65 | 1.3 | 0.0 | - | SW | Light yellow-brown (10YR 6/4) fine to coarse grained well-graded subrounded to subangular SAND, little Silt, few fine to coarse subrounded Gravel, no odor, dense, aplastic, damp. Glacial-alluvial. | SAND |
| 20 | 20 | 11 | 20-22 | 10 13 50/4" | NA | 1.0 | 0.0 | - | | Gravel in shoe. | |
| | | 12 | 22-24 | 16 20 39 43 | 69 | 1.7 | 0.0 | - | | Gravel in shoe. Increased coarseness and angularity with depth. Increased oxidation, dark yellow-brown (10YR 4/6). | |
| | | | | | | | | | SM | Fining downwards to a Silty SAND, increased angularity and coarseness, increased density. Moist. | Silty SAND |
| 25 | 25 | 13 | 24-26 | 10 22 44 50 | 66 | NA | 0.0 | - | CL | Gray (10YR 2/1) Silty lean CLAY, little fine to coarse subrounded Sand, few fine to medium rounded Gravel, no odor, hard, weakly plastic, dry. Occasional saturated well-graded fine to coarse subrounded to subangular SAND (SW) lenses up to 2" thick. Occasional Silt, saturated, lenses up to 2" thick. | SILTY CLAY |
| | | 14 | 26-28 | 50 8 50/2" | NA | NA | 0.0 | - | | Gray (10YR 5/1) Silty CLAY, little fine to coarse subrounded Sand, few fine to medium rounded Gravel, no odor, hard, weakly plastic, dry. Clay Till. | |
| 30 | 30 | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 12/03/01 | 24.5' bgs | |

Project: 644.12.001 Template: j:\rockware\logplot2001\logfiles\64410\Auger_well2.ldf
Data File: BD01-01.dat Date: 1/22/02

| | | |
|---|---|---|
| **Date Start/Finish:** 11/30/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** BD01-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-2 | 6 7 9 10 | 16 | 1.8 | 0.0 | - | SM | | Gray-brown (10YR) Silty SAND, fine subangular Sand, little Clay, poorly graded, no odor, dense, damp under rainfall. Vegetation and roots present. Topsoil. | SILTY SAND | |
| | | 2 | 2-4 | NA | NA | NA | NA | NA | FL | | Spoon refusal, rubbly drilling. Subsurface CONCRETE as stacked thick slabs. | FILL | |
| 5 | 5 | 3 | 4-6 | 3 3 5 50"/0 | 8 | 0.0 | 0.0 | - | FL | | Terra cotta fragments, water immediately above concrete. | FILL | Borehold backfilled with Bentonite to grade. |
| | | NA | NA | NA | NA | NA | NA | NA | FL | | CONCRETE, in situ. | FILL | |
| | | 4 | 8-10 | 5 6 10 9 | 16 | 1.5 | 0.0 | - | SM | | Yellow-brown (10YR 5/4) Silty SAND, fine subangular Sand, little Clay, poorly graded, no odor, moderately dense to dense, aplastic, damp. | SAND | |
| 10 | 10 | | | | | | | | CL | | Yellow-brown (10 YR 5/4) lean Silty CLAY, little fine to coarse subangular to subrounded Sand, no odor, stiff, weakly to moderately plastic, dry. Clay Till. | CLAY | |
| | | 5 | 10-12 | 4 6 6 5 | 12 | 1.8 | 0.0 | - | SM | | Yellow-brown (10YR 5/4) fine subangular Silty SAND, little Clay, poorly graded, no odor, dense, aplastic, damp. Coarsens downward. | SAND | |
| | | 6 | 12-14 | 7 18 19 9 | 37 | 1.9 | 0.0 | - | SW | | Gray-brown fine to coarse grained subrounded to subangular SAND, little Silt, trace Clay, well graded, no odor, moderately dense, aplastic, damp to moist. Glacial-alluvial. | SAND | |
| 15 | 15 | 7 | 14-16 | 2 4 9 13 | 13 | 1.2 | 0.0 | - | SW | | | SAND | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0-2', 8-10' and 12-14' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/30/01 | 15.0' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** BD01-02

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 16-18 | 4 6 6 13 | 12 | 1.6 | 0.0 | - | SW | | Gray-brown fine to coarse grained subrounded to subangular SAND, little Silt, trace Clay, well graded, no odor, moderately dense, aplastic, damp to moist. Glacial-alluvial. | SAND | Borehold backfilled with Bentonite to grade. |
| | | | | | | | | | | | Gray (10YR 5/1) Silty CLAY (CL), little fine to coarse subangular to subrounded Sand, no odor, stiff, weakly plastic, dry. Clay Till. | | |
| 20 | 20 | | | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0-2', 8-10' and 12-14' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/30/01 | 15.0' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/3/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 24' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** BD01-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | ASPHALT. | | |
| | | 1 | 0-2 | 4 5 5 4 | 10 | 1.8 | 0.0 | - | ML | | Yellow brown (10YR 5/4) SILT, some poorly graded fine to medium subangular Sand, few Clay, no odor, moderately dense, aplastic, dry. | SILT | |
| | | 2 | 2-4 | 6 6 5 5 | 11 | 1.5 | 0.0 | - | CL | | Yellow brown (10YR 5/4) lean Silty CLAY, little fine to medium subangular Sand, no odor, moderately stiff, weakly to moderately plastic, dry. Clay Till. | CLAY | 2" ID PVC Riser 0-19' bgs |
| 5 | 5 | 3 | 4-6 | 3 3 3 4 | 6 | 2.0 | 0.0 | - | | | Occasional Silty Sand seams, moist to wet, up to 1.5" thick. | | |
| | | 4 | 6-8 | 3 3 3 3 | 6 | 1.8 | 0.0 | - | SW | | Yellow brown (10YR 5/4) fine to coarse subangular to subrounded SAND, some to little Silt, trace Clay, well graded, no odor, moderately dense, aplastic, moist. Fill. | SAND | Grout 0-17' bgs |
| | | 5 | 8-10 | 3 3 4 5 | 7 | 1.3 | 0.0 | - | | | Yellow brown (10YR 5/6) and well graded. Coarsens downward. | | |
| 10 | 10 | 6 | 10-12 | 2 4 4 3 | 8 | 1.6 | 0.0 | - | | | Thin (approximately 3 mm) lens of black ash. | | |
| | | 7 | 12-14 | 2 4 6 10 | 10 | 1.5 | 0.0 | - | | | | | |
| 15 | 15 | 8 | 14-16 | 6 16 16 18 | 32 | 1.2 | 0.0 | - | | | Light yellow brown (10YR 6/4) fine to coarse subangular to subrounded SAND, little Silt and Clay, trace fine rounded Gravel, well graded, no odor, dense, aplastic, moist. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 12/3/01 | 20.5' bgs | |

**Client:**
General Motors

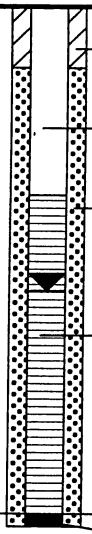
**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** BD01-03

**Borehole Depth:** 24' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 5, 13, 17, 24 | 30 | 1.7 | 0.0 | - | SW | Light yellow brown (10YR 6/4) fine to coarse grained subangular to subrounded SAND, little Silt and Clay, trace fine rounded Gravel, especially confined to lenses, occasional Silty Sand lenses up to 1" thick throughout, well graded, no odor, dense, aplastic, moist. [Glacial-alluvial.] Increased angularity, density, and coarseness with depth. | SAND |
| | | 10 | 18-20 | 10, 21, 20, 22 | 41 | 1.7 | 0.0 | - | | Moist to wet. | |
| 20 | 20 | 11 | 20-22 | 10, 13, 20, 20 | 33 | 1.8 | 0.0 | - | | Saturated. Increased grain size to fine to coarse grained subrounded Gravel. Yellow brown (10YR 6/8) with increased oxidation. | |
| | | 12 | 22-24 | 9, 12, 13, 27 | 25 | 2.0 | 0.0 | - | | | |
| | | | | | | | | | ML | Gray (10YR 5/1) SILT, some to little Clay, no odor, dense, aplastic, saturated. Glacial-alluvial. | SILT |
| 25 | 25 | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 12/3/01 | 20.5' bgs | |

Project: 644.12.001 Template: j:\rockware\logplot2001\logfiles\64410\Auger_well2.ldf
Data File: BD01-03.dat Date: 1/22/02

| | | |
|---|---|---|
| **Date Start/Finish:** 5/09/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:**<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 562286.44<br>**Easting:** 13305746.34<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** 738.77<br><br>**Descriptions By:** S Kerr | **Boring ID:** RFI-02-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | |
| 0 | | | | | | | | | | | |
| | | 1 | 0-2 | 0.5 | 4.1 | - | FL | | CONCRETE. | FILL | Bentonite backfill to grade. |
| | | | | | | | SP | | Very dark grayish brown fine SAND, little Silt and Clay, dense, moist, no odor. | SAND | |
| | | 2 | 2-4 | 1.7 | 4.5 | - | | | Trace coarse Sand. | | |
| | 735 | | | | | | | | | | |
| | | 3 | 4-6 | 2.0 | 5.9 | - | FL | | CONCRETE. | FILL | |
| 5 | | | | | | | ML | | Grayish brown SILT, very stiff, dry, no odor. | SAND and SILT | Temporary well set at 11' bgs |
| | | 4 | 6-8 | 2.0 | 4.5 | - | SM | | Dark gray Silty fine to medium SAND, moist, no odor. | | |
| | | | | | | | ML | | SILT as above at 4.7-6.0'. | | |
| | 730 | 5 | 8-10 | 1.8 | 5.0 | - | SP | | Light olive brown fine to medium SAND, wet, no odor. | | |
| 10 | | | | | | | ML | | SILT as above at 4.7-6.0', moist. | | |
| | | 6 | 10-12 | 2.0 | 1.7 | - | SP | | SAND as above at 9.0-9.5' with trace subangular Gravel at approximately 10.8'. | | |
| | | | | | | | ML | | SILT as above at 4.7-6.0', no mottling, trace subangular Gravel. | | Sand backfill |
| | 725 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs=below ground surface;
Sample collected at 0-2', 8-10' bgs.
1" ID 10-ft 0.01" slot screen temporary well set 1-11' bgs.
NA = Not Applicable/Not Available

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/9/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** Direct push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:** NA<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 562113.94<br>**Easting:** 13305719.46<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 738.87<br><br>**Descriptions By:** S Kerr | **Boring ID:** RFI-02-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | |
| 0 | | | | | | | FL | | CONCRETE. | FILL | |
| | | | | | | | | | Black medium to coarse SAND, no odor, loose, aplastic, dry. (SP) | | |
| | | 1 | 0-2 | 1.3 | 2.5 | - | CL | | Grayish brown Silty CLAY, trace fine Sand and Gravel, dry, no odor. | | |
| | | 2 | 2-4 | 1.8 | 4.2 | - | SP | | Very dark brown fine SAND, trace subangular Gravel, dry, no odor, aplastic. | SAND | Borehole backfilled with bentonite to grade. |
| | 735 | | | | | | | | As above, yellowish brown, loose. | | |
| | | | | | | | SM | | Very dark brown Silty SAND, moist, no odor, moderately loose. | | |
| 5 | | 3 | 4-6 | 2.0 | 5.5 | - | CL | | Brown CLAY, dry, no odor. | CLAY | |
| | | 4 | 6-8 | 2.0 | 8.1 | - | SP | | Yellow brown fine SAND, trace subangular Gravel, moist, no odor, aplastic. | SAND | |
| | 730 | 5 | 8-10 | 2.0 | 9.6 | - | ML | | Yellowish brown Clayey SILT, gray mottling, trace angular Gravel, dry, no odor. Moist at 8.0', trace Sand. | CLAYEY SILT | |
| 10 | | 6 | 10-12 | 2.0 | 3.4 | - | SP | | Yellowish brown fine to medium SAND, aplastic, saturated, no odor, fairly loose. | SAND | |
| | | | | | | | ML | | Yellowish brown SILT, wet, dense, no odor. | SILT | |
| | 725 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; pp=pocket penetrometer
NA = Not Applicable/Not Available
1" ID 5-ft 0.01" slot screen temporary well set at 12' bgs.
Samples collected 0.5-2' and 8-10' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/9/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:** NA<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 562056.8<br>**Easting:** 13305709.36<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** 738.97<br><br>**Descriptions By:** B Loomis | **Boring ID:** RFI-02-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | |
| 0 | | | | | | | | | CONCRETE. | FILL | |
| | | 1 | 0-2 | 0.9 | 0.0 | - | | | Very dark brown (10YR 2/2) fine to medium SAND, trace bright yellow chunks that appear to be paint, aplastic, dry, no odor. | SAND | |
| | | 2 | 2-4 | 1.6 | 0.0 | - | SP | | 2.3-3.6': Dark yellowish brown (10YR 4/6) fine subangular SAND with some Silt, dry, no odor.<br>4-4.7': Reddish brown fine SAND, moist. | | Borehole backfilled with Bentonite to grade. |
| | 735 | | | | | | | | 4.7-5.0': Dark yellow brown (10 YR 4/6) fine to medium subrounded to subangular SAND, trace subrounded Gravel, moist. | | |
| 5 | | 3 | 4-6 | 1.5 | 4.6 | - | ML | | Very dark grayish brown (10YR 3/2) SILT, gray mottles, dry, no odor. | SILT | |
| | | 4 | 6-8 | 2.0 | 1.5 | - | | | Brown (10YR 4/3) CLAY, trace fine Sand, gray mottles, stiff to very stiff, no odor. Clay Till. | CLAY | |
| | 730 | 5 | 8-10 | 2.0 | 0.9 | - | CL | | 8-12.4': No gray mottles, trace subrounded Gravel, moist to wet, and a brown (10YR 4/3) fine to medium subrounded Sand seam. Clay Till. | | |
| 10 | | 6 | 10-12 | 1.5 | 0.0 | - | | | | | |
| | | 7 | 12-14 | 2.0 | NA | | SP | | Brown (10YR 4/3) fine to medium subrounded SAND, some subrounded to subangular Gravel, loose, saturated, no odor. | SAND | |
| | 725 | | | | | | CL | | CLAY, as at 8-10'. Clay Till. | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Samples collected at 0-2' and 8-10' bgs.
Temporary well set at 14' bgs with a 1' stick up.

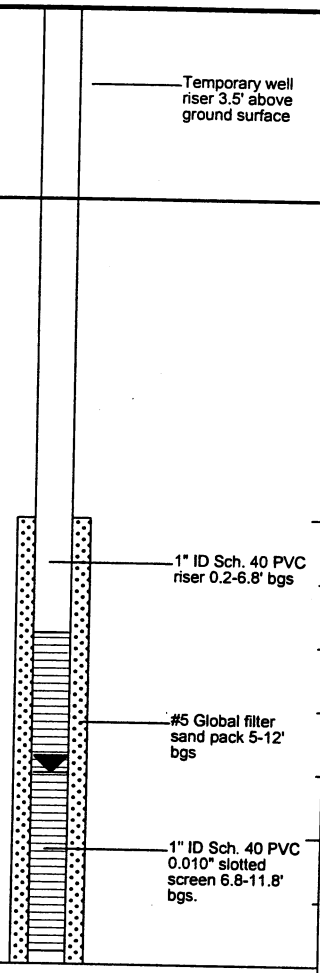
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 05/09/01 | 12.4' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/9/01 - 5/10/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:** NA<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 561932.78<br>**Easting:** 13305913.68<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** 739.26<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-02-04<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | |
| 0 | | | | | | | | | CONCRETE. | FILL |
| | | 1 | 0-2 | 0.9 | 9.1 | - | SW | | Black (10YR 2/1) fine SAND, aplastic, medium dense, dry, no odor, trace dark yellowish brown fine Sand. | SAND, FINE |
| | | 2 | 2-4 | 1.3 | 9.0 | - | SP | | Dark yellowish brown (10YR 3/4) coarse SAND, loose, dry, no odor, with Wood debris, few fine to medium Sand, Rubble, and fine Gravel. | |
| 5 | 735 | 3 | 4-6 | 1.2 | 13.3 | - | | | Dark yellowish brown (10 YR 4/6) coarse SAND, moderately loose, dry, some subangular Gravel, aplastic, no odor. | |
| | | 4 | 6-8 | 1.6 | 32.3 | - | ML | | Wood debris, Rocks, Gravel, some dark brown Silt, moist. Fill. | FILL |
| | | | | | | | SP | | SAND as at 4 - 6.8' bgs, some fine and coarse rounded Gravel, saturated, no odor. | |
| 10 | 730 | 5 | 8-10 | 2.0 | 16.0 | - | CL | | Dark grayish brown (2.5 YR 4/2) Silty CLAY, some gray mottling, trace subrounded coarse Sand, hard, moist, slight odor. | |
| | | | | | | | SP | | Very dark grayish-brown (10YR 3/2) medium to coarse subrounded SAND, little fine Sand, loose, no odor, saturated. | SAND |
| | | 6 | 10-12 | 2.0 | 8.5 | - | CL | | Silty CLAY as at 8.8 - 10' bgs, no odor. | |
| 15 | 725 | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Samples collected at 1.1-2', 6-8', and 8-10' bgs.

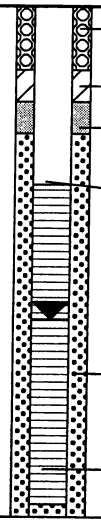
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/10/01 | 9.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/18/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 562376.22<br>**Easting:** 13305695.45<br>**Casing Elevation:** 738.88<br><br>**Borehole Depth:** 8' bgs<br>**Surface Elevation:** 739.25<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-02-05<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | | |
| 0 | | | | NA | | | | | FL | | CONCRETE. | FILL |
| | | 1 | 0-2 | 3<br>7<br>18 | 10 | 1.2 | 0.2 | - | SP | | Black (10 YR 2/1) medium to coarse angular SAND, little Silt, no odor, dry, loose. Slag and/or Foundry sand. | SAND |
| | | 2 | 2-4 | 5<br>4<br>4<br>4 | 8 | 1.4 | 5.0 | + | ML | | Black (10 YR 2/1) and dark gray (10 YR 4/1) varved SILT, little fine to medium subangular Sand and Clay, aplastic, weak odor, moist, dense, varves up to 1" thick. | SILT |
| | 735 | | | | | | | | | | | |
| 5 | | 3 | 4-6 | 3<br>3<br>6<br>8 | 9 | 1.6 | 2.9 | - | SP<br>CL<br>ML | | Black (10 YR 2/1) coarse angular SAND, as at 0.7-2.8' bgs, wet. | |
| | | 4 | 6-8 | 6<br>8<br>9<br>11 | 17 | 1.6 | 2.3 | - | SP<br>CL | | Very dark gray (10 YR 3/1) to gray (10 YR 5/1) mottled Silty CLAY, little fine to medium subangular Sand, no odor, wet, soft (pp=0.75 tons/sq. feet).<br>Gray-brown (10 YR 5/2) SILT, few to little fine to medium subangular Sand, little Clay, aplastic, no odor, wet, dense.<br>Dark gray (10 YR 4/1) fine to coarse subrounded to subangular SAND, some Silt, little Clay, aplastic, no odor, wet, moderately dense.<br>Gray-brown CLAY, some Silt, little fine to medium subangular to subrounded Sand, few fine to coarse rounded Gravel, no odor, dry, hard (pp=>4.5 tons/sq. feet). Locally oxidized along fractures and selvages. Clay Till. | SILT<br>SAND<br>CLAY |
| | 730 | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available.
Samples collected 0.7-2' and 2-4' bgs.
pp=pocket penetrometer

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/18/01 | 4.9' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/10/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:** 2 1/4"<br>**Rig Type:** 66 DT Advanced Geoprobe | **Northing:** 562718.38<br>**Easting:** 13306072.3<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 6.6' bgs<br>**Surface Elevation:** 738.87<br><br>**Descriptions By:** S Kerr | **Boring ID:** RFI-02-06<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | |
| 0 | | | | | | | FL | | CONCRETE. | | |
| | | 1 | 0-2 | 1.2 | 20.8 | - | SM | | Black (10YR 2/1) fine to medium Silty SAND, few subrounded Gravel, aplastic, wet, no odor, medium dense. Fill. | SAND | |
| | | | | | | | | | Brown (10YR 5/3) fine to medium SAND, trace rounded Gravel, aplastic, moist, medium dense. | | |
| | | | | | | | | | As 0.7-1.1' bgs, trace Clay. | | Borehole backfilled with Bentonite to grade. |
| | | 2 | 2-4 | 2.0 | 52.5 | - | | | Yellow brown (10YR 5/4) Silty fine SAND, aplastic, loose, dry, no odor. | | |
| | 735 | | | | | | GW | | As above, black (10YR 2/1), little Clay, aplastic, dry, slight odor, medium dense. | | |
| 5 | | 3 | 4-6 | 2.0 | 43.1 | - | SP | | Gray-brown to black coarse angular to subangular GRAVEL, few fine to medium Sand, trace Silt and Clay. | SAND, CLAY LENSE | |
| | | | | | | | | | Very dark gray brown (10YR 3/2) Silty SAND, little subrounded to angular Gravel, dry, no odor, loose. | | |
| | | | | | | | CL | | Dark gray brown Silty CLAY, little fine to coarse Sand, some oxidation, moist. | | |
| | | 4 | 6-6.6 | 0.3 | 35.3 | - | SM | | Orange brown fine to coarse SAND, some subangular Gravel and Concrete, dense, dry, no odor. Fill. | | |
| | | | | | | | | | Black (10YR 2/1) fine Silty SAND, little Clay, aplastic, dry, slight odor, medium dense. | | |
| | 730 | | | | | | | | Gray brown fine to medium SAND, little Clay, trace Silt, no odor, medium dense, moist. | | |
| 10 | | | | | | | | | | | |
| | 725 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs=below ground surface; NA = Not Applicable/Not Available; Cored 8.5" of concrete with water.

Soil samples collected from 8-10' and 10-12' bgs.

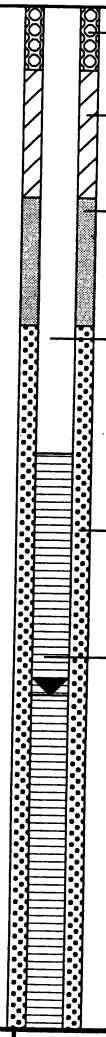
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/21/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Chaperon<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4"<br>**Rig Type:** CME 55 | **Northing:** 566522.57<br>**Easting:** 13306799.00<br>**Casing Elevation:** 751.91<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:**<br><br>**Descriptions By:** SM Duly | **Boring ID:** 20-105R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | -- -- | | | | | FL | | Concrete. | FILL |
| | 750 | 1 | 1-3 | 5 9 9 13/5' | 18 | 2.0 | 0.0 | - | ML | | Very dark brown (10YR 4/1) SILT, little fine subangular Sand, little Clay, no odor, dense, aplastic, damp. Fill. | SILT |
| | | 2 | 3-5 | 3 2 2 2 | 4 | 1.6 | 0.0 | - | FL | | Concrete. | |
| 5 | | 3 | 5-7 | 1 2 2 3 | 4 | 1.8 | 0.0 | - | CL | | Yellow-brown (10YR 5/4) Silty lean CLAY, little fine subangular Sand, trace fine rounded Gravel, no odor, initially soft becoming more stiff with depth, damp. Clay Till.<br>Moist. | SILTY CLAY |
| | 745 | 4 | 7-9 | 1 3 4 3 | 7 | 2.0 | 0.0 | - | ML | | Yellow-brown (10YR 5/4) SILT, little Clay, little fine subangular Sand, no odor, moderately dense, aplastic, moist. Fill.<br>Becomes more sandy. | SILT |
| 10 | | 5 | 9-11 | 1 6 5 5 | 11 | NA | 0.0 | - | | | Saturated. | |
| | 740 | 6 | 11-13 | 3 6 7 10 | 13 | 1.8 | 0.0 | - | | | Becomes grayer. Glacial-alluvial. Local oxidation as varves/lenses up to 1/2" thick. | |
| | | 7 | 13-15 | 4 7 9 8 | 16 | 2.0 | 0.0 | - | | | | |
| 15 | | 8 | 15-17 | 4 5 | 11 | 0.8 | 0.0 | - | | | Gray (10YR 5/1). No oxidation present to end of boring.<br>Increased Sand content to a Silty SAND locally. | |

**Boring Construction**



- Cement pad with 9" diam. flush-mount cover.
- Grout 1-3' bgs.
- Bentonite seal 3-5' bgs.
- 2" ID Sch. 40 PVC riser 0.2-7' bgs.
- Global #5 sand pack 5-17' bgs.
- 2" ID Sch. 40 PVC 0.010"slottedscreen 7-17' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
PID Background: 0.0 ppm.
Samples collected 1-3' and 7-9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** 20-105R

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | 8 | 15-17 | 6<br>9 | 11 | 0.8 | 0.0 | - | ML | | Yellow-brown (10YR 5/4) SILT, little Clay, little fine subangular Sand, no odor, moderately dense, aplastic, moist. Fill. | SILT | Global #5 sand pack 5-17' bgs. |
| | | | | | | | | | | | Overdrilled to accomodate heaving sand. | SAND | 2" ID Sch. 40 PVC 0.010"slottedscreen 7-17' bgs. |
| 20 | | | | | | | | | | | | | |
| | 730 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
PID Background: 0.0 ppm.
Samples collected 1-3' and 7-9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/12/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 561072.94<br>**Easting:** 13305831.86<br>**Casing Elevation:** 730.46<br><br>**Borehole Depth:** 33' bgs<br>**Surface Elevation:** 730.31<br><br>**Descriptions By:** SM Duly | **Boring ID:** 40-303R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 730 | | | | | | | | Fill | | Concrete. | FILL | 9-inch diam. flush-mount cover with cement pad. |
| | | 1 | 1-3 | 3 3 3 4 | 6 | 1.8 | 0.0 | - | SM | | Yellow-brown (10 YR 5/4) Silty fine to medium SAND, trace Clay, aplastic, moderately dense, no odor, dry. Fill. | SILTY SAND | |
| | | 2 | 3-5 | 3 4 4 4 | 8 | 1.2 | 0.0 | - | | | | | |
| 5 | 725 | 3 | 5-7 | 7 8 10 8 | 18 | 2.0 | 0.0 | - | CL | | Gray (10 YR 6/1) Silty CLAY, with extensive yellow-brown (10 YR 5/6) mottling and oxidation, trace fine to coarse subrounded Sand, plastic, moderately soft, no odor, damp. Clay Till. | Silty Clay | 2" ID Sch. 40 PVC riser 0.2 to 22.5' bgs. |
| | | | | | | | | | ML | | Yellow-brown (10 YR 5/4) SILT, little Clay, aplastic, dense, no odor, moist.<br>Light brown-gray (10 YR 6/2). | SILT | |
| | | 4 | 7-9 | 5 6 9 14 | 15 | 2.0 | 0.0 | - | CL | | Gray (10 YR 5/1) Silty CLAY, as at 4.7-6' bgs, with yellow-brown (10 YR 5/6) oxidation/mottling, moist. | SILTY CLAY | Grout 1 to 18' bgs. |
| 10 | 720 | 5 | 9-11 | 9 14 32 39 | 46 | 2.0 | 0.0 | - | | | Little fine rounded Gravel and little fine to medium subrounded Sand, wet to moist.<br>Dry, homogeneous weakly plastic gray (10 YR 5/1), little fine to medium subrounded to subangular Sand, trace rounded fine to medium Gravel, hard, no odor. Clay Till. | | |
| | | 6 | 11-13 | 9 19 29 36 | 48 | 2.0 | 0.0 | - | | | | | |
| | | 7 | 13-15 | 8 15 19 22 | 34 | 2.0 | 0.0 | - | | | | | |
| 15 | 715 | 8 | 15-17 | 8 15 | 34 | 2.0 | 0.0 | - | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected at 1-3', 8-10', and 27-29' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/13/01 | 13' bgs | |
| 11/13/01 | 30.3' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** 40-303R

**Borehole Depth:** 33' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 15-17 | 19 26 | 34 | 2.0 | 0.0 | - | CL | Gray (10 YR 5/1) Silty CLAY, as at 4.7-6' bgs, with yellow-brown (10 YR 5/6) oxidation/mottling, moist. | SILTY CLAY |
| | | 9 | 17-19 | 10 17 24 28 | 41 | 2.0 | 0.0 | - | | | |
| 20 | 710 | 10 | 19-21 | 9 16 21 23 | 37 | 2.0 | 0.0 | - | | Occasional to rare silt to fine sand lenses up to 1" wide, moist to wet. | |
| | | 11 | 21-23 | 11 17 22 21 | 39 | 2.0 | 0.0 | - | | Few Sand, no gravel present. | |
| | | 12 | 23-25 | 8 15 22 26 | 37 | 2.0 | 0.0 | - | | Faint varves present. | |
| 25 | 705 | 13 | 25-27 | 7 14 26 36 | 40 | 2.0 | 0.0 | - | | 2" wide wet fine sand to silt lens. | |
| | | 14 | 27-29 | 16 32 26 31 | 58 | 2.0 | 0.0 | - | ML | Gray (10 YR 6/1) SILT, some to little Clay, aplastic, very dense, no odor, dry. Glacial-alluvial. | SILT |
| 30 | 700 | 15 | 29-31 | 10 12 14 15 | 26 | 2.0 | 0.0 | - | | 4" wide very fine to fine sand and silt seam. Wet to saturated. | |
| | | 16 | 31-33 | 14 13 19 28 | 32 | 2.0 | 0.0 | - | CL | Silty CLAY as at 7.2-27.2' bgs, very stiff to hard, dry. | SILTY CLAY |
| 35 | 695 | | | | | | | | | | |

**Boring Construction**

- Grout 1 to 18' bgs.
- 2" ID Sch. 40 PVC riser 0.2 to 22.5' bgs.
- Bentonite seal 18 to 21' bgs.
- Global filter sandpack 21 to 33' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 22.5 to 32.5' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected at 1-3', 8-10', and 27-29' bgs.

**Water Level Data**

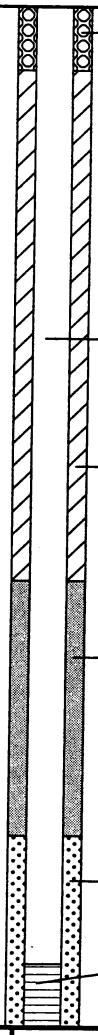
| Date | Depth | Elev. |
|---|---|---|
| 11/13/01 | 13' bgs | |
| 11/13/01 | 30.3' bgs | |

Project: 644.10.022
Data File:40-303R.dat
Template: j:\rockware\logplot2001\logfiles\64410\Auger_well.ldf
Date: 1/16/02

| | | |
|---|---|---|
| **Date Start/Finish:** 11/13/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 561783.6<br>**Easting:** 13305750.8<br>**Casing Elevation:** 737.9<br><br>**Borehole Depth:** 25' bgs<br>**Surface Elevation:** 738.44<br><br>**Descriptions By:** SM Duly | **Boring ID:** 40-4R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | | |
| 0 | | | | | | | | | Fill | | Concrete. | FILL |
| | | 1 | 1-3 | 5 5 6 7 | 11 | 1.4 | 3.8 | - | SP | | Yellow-brown (10 YR 5/6) poorly graded fine to medium subrounded to subangular SAND, some Silt, trace Clay, aplastic, moderately dense to dense, no odor, dry. Fill. | SAND |
| | 735 | 2 | 3-5 | 5 6 6 7 | 12 | 1.8 | 23.8 | - | | | | |
| 5 | | 3 | 5-7 | 3 4 4 5 | 8 | 1.8 | 32.1 | - | | | Trace fine rounded Gravel, damp. | |
| | 730 | 4 | 7-9 | 3 3 2 2 | 5 | 1.1 | 78.4 | - | | | Color change to a browner yellow-brown (10 YR 5/4). | |
| 10 | | 5 | 9-11 | 5 5 6 6 | 11 | 1.5 | 107 | - | | | Brown (10 YR 5/3), moderate odor. | |
| | | 6 | 11-13 | 5 6 32 7 | 38 | 1.2 | 954 | + | | | Black (10 YR 2/1) oily sheen, strong odor, moist. | |
| | | | | | | | | | Fill | | Concrete rubble and debris. Fill. | |
| | 725 | 7 | 13-15 | 5 7 7 9 | 14 | 1.7 | 1637 | + | CL | | Gray (10 YR 5/1) Silty CLAY with black (10 YR 2/1) and yellow-brown (10 YR 5/6) mottling, little fine to medium subrounded Gravel, plastic, soft to moderately stiff, moderate odor, dry. | SILTY CLAY |
| 15 | | 8 | 15-17 | 7 5 | 8 | 1.9 | 953 | + | SM | | Gray-brown (10 YR 5/2) Silty fine to medium subangular poorly graded SAND, few Clay, little to few fine rounded Gravel, aplastic, moderately dense, moderate odor, moist. | |

**Boring Construction**



- 9-inch diam. flush-mount cover with cement pad.
- 2" ID Sch. 40 PVC riser 0.2 to 15' bgs.
- Grout 1 to 9' bgs.
- Bentonite seal 9 to 13' bgs.
- Global filter sand pack 13 to 25' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 15 to 25' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available
Samples collected at 1-3', 8-10', 13-15', and 15-17' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/13/01 | 17.5' bgs | |

**Client:**
General Motors

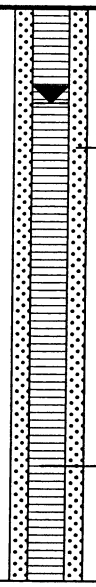
**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** 40-4R

**Borehole Depth:** 25' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 15-17 | 3 3 | 8 | 1.9 | 953 | + | SM | | As above, oily sheen, increased moisture with depth. | SILTY SAND |
| | 720 | 9 | 17-19 | 2 2 3 2 | 5 | 1.5 | 1800 | + | | | Saturated, strong odor. | |
| 20 | | 10 | 19-21 | 2 3 4 3 | 7 | 1.4 | 1157 | + | | | | |
| | | 11 | 21-23 | 1 3 3 1 | 6 | 1.2 | 1008 | + | | | | |
| | 715 | 12 | 23-25 | 5 5 6 7 | 11 | 1.3 | 403 | + | SW | | Dark gray-brown (10 YR 4/2) fine to coarse subrounded to subangular well graded SAND, few Silt, few fine rounded Gravel, aplastic, loose, moderate odor, oily sheen, saturated. Glacial-alluvial. | SAND |
| 25 | | | | | | | | | | | Black (10 YR 2/1), oily sheen, strong odor. | |
| | 710 | | | | | | | | | | | |
| 30 | | | | | | | | | | | | |
| | 705 | | | | | | | | | | | |
| 35 | | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available
Samples collected at 1-3', 8-10', 13-15', and 15-17' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/13/01 | 17.5' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/20/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 561635.2<br>**Easting:** 13305941.08<br>**Casing Elevation:** 733.18<br><br>**Borehole Depth:** 22' bgs<br>**Surface Elevation:** 733.89<br><br>**Descriptions By:** SM Duly | **Boring ID:** 40-7R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | |
| | | 1 | 0-2 | 8 8 8 6 | 16 | 1.5 | 1.0 | + | | | Fine grained to cobble-sized angular aggregate GRAVEL (GW). Aggregate Fill.<br>Dark brown (10YR 3/1) SILT, little to some Clay, little fine to medium subangular Sand, few fine to coarse grained angular large Gravel (aggregate),weak odor, moderately dense, aplastic, damp. | SILT | Cement pad with 9" diam. flush-mount cover.<br>Grout 1-4' bgs. |
| | 730 | 2 | 2-4 | 4 4 5 8 | 9 | 2.0 | 10.4 | + | ML | | Wide lense of black Coal fragments 1.2'-2.0' bgs.<br>Becomes wet, yellow brown (10YR 5/4) 3'-5' bgs. Perched water. No odor. | | |
| 5 | | 3 | 4-6 | 7 9 6 5 | 15 | 1.0 | 0.0 | + | | | Rubbly drilling.<br>Moist 5.0'5.5' bgs.<br>Wet. | | Bentonite seal 4-6' bgs. |
| | | 4 | 6-8 | 3 2 3 5 | 5 | 1.7 | 0.0 | + | | | Brown (10YR 5/3) with gray (10YR 5/1) mottling lean CLAY, some Silt, few fine to medium subangular Sand, trace fine to medium rounded to subrounded Gravel, no odor, moderately stiff, weakly plastic, damp. Clay Till. | CLAY | 2" ID Sch. 40 PVC riser 0.2-8' bgs. |
| | 725 | 5 | 8-10 | 2 4 6 12 | 10 | 2.0 | 0.0 | + | CL | | | | Global #5 sand pack 6-23' bgs. |
| 10 | | 6 | 10-12 | 11 20 33 28 | 53 | 2.0 | 46.8 | + | | | Becomes dry and hard. Rare moist Silty Sand lenses up to 1" wide. | | 2" ID Sch. 40 PVC 0.010"slottedscreen 8-18' bgs. |
| | 720 | 7 | 12-14 | 18 19 10 8 | 29 | 2.0 | 3291 | + | | | Gray (10YR 5/1) fine poorly graded SAND, some Silt, few Clay, moderate odor, moderately dense, aplastic, moist. | SAND | |
| 15 | | 8 | 14-16 | 8 2 3 3 | 5 | 1.2 | 1610 | + | SP | | Saturated. Strong odor, oily sheen. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;+ = Positive Test Result
NA = Not Applicable/Not Available
WH=Weight of Hammer
Samples collected at 0-2', 2-4', 8-10', and 12-14' intervals

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/13/01 | 15.0' bgs | |

Project: 644.10.022
Data File: 40-7R.dat
Template: j:\rockware\logplot2001\logfiles\64410\Auger_well3.ldf
Date: 1/16/02

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** 40-7R

**Borehole Depth:** 22' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | WH 1 1 1 | 2 | 1.3 | 1589 | + | | | Gray (10YR 5/1) fine poorly graded SAND, some Silt, few Clay, moderate odor, moderately dense, aplastic, moist. | SAND | Global #5 sand pack 6-23' bgs. 2" ID Sch. 40 PVC 0.010"slottedscreen 8-18' bgs. |
| | 715 | 10 | 18-20 | WH WH 1 1 | 1 | NA | 1767 | + | SP | | Black (10YR 2/1). | | |
| 20 | | 11 | 20-22 | WH 1 2 5 | 3 | NA | 1778 | + | | | Overdrilled 1' to 23' because of heaving sands. | | |
| | 710 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 705 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 700 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;+ = Positive Test Result
NA = Not Applicable/Not Available
WH=Weight of Hammer
Samples collected at 0-2', 2-4', 8-10', and 12-14' intervals

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/13/01 | 15.0' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/8/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 566567.49<br>**Easting:** 13305609.22<br>**Casing Elevation:** 752.6<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 752.6<br><br>**Descriptions By:** S Kerr | **Boring ID:** 43-101R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | | | |
| 0 | | | | | | | | | GP | | Coarse GRAVEL, aggregate. | | Cement Pad 0-1' bgs |
| | | 1 | 0-2 | -- -- -- -- | -- | NA | 0.0 | - | ML | | Very dark gray (10YR 3/1) SILT, little fine to coarse Sand, few to coarse angular to subrounded Gravel, trace Clay, no odor, loose, damp. | SILT | |
| | 750 | 2 | 2-4 | 2 2 2 2 | 4 | 0.9 | 0.0 | - | | | No gravel. | | Grout 1-4' bgs |
| 5 | | 3 | 4-6 | 2 3 3 5 | 6 | 1.3 | 0.0 | - | | | Olive-yellow (2.5 Y 6/6) SILT, some Clay, no odor, aplastic, dry. | | Bentonite Seal 4-6' bgs |
| | | 4 | 6-8 | 1 1 2 2 | 3 | 1.6 | 0.0 | - | SP | | Yellow-brown (10YR 5/6) fine poorly graded SAND, little Silt, trace Clay, loose, aplastic, dry to damp.<br>Black (10YR 2/1) fine SAND, little Silt, trace Clay, loose, aplastic, dry to damp.<br>Yellow-brown (10YR 5/6) fine SAND, little Silt, trace Clay, loose, aplastic, dry to damp. | SAND | 2" ID Sch. 40 PVC Riser 0-8' bgs |
| | 745 | 5 | 8-10 | 1 2 2 1 | 4 | 1.2 | 4.0 | - | | | Mottled (10YR 5/6) and dark grayish brown (10YR 4/2) SAND, trace Clay, trace fine to medium Gravel, moist. Some Clay 7.1-7.4' bgs. | | |
| 10 | | 6 | 10-12 | 1 1 1 1 | 2 | 1.6 | 0.0 | - | | | Black (10YR 2/1) fine, poorly graded SAND, little Silt, trace Clay, loose, aplastic, dry to damp. Saturated @ 11.3' bgs. | | #5 Global Filter Sand Pack 6-18' bgs |
| | 740 | 7 | 12-14 | 1 1 3 4 | 4 | 1.6 | 0.0 | - | | | 11.7: Mottled yellow (10YR 5/6) and dark grayish brown (10YR 4/2) SAND.<br>12.4: Yellow-brown (10YR 5/6) fine SAND, some Silt, no odor, loose, saturated. | | |
| 15 | | 8 | 14-16 | 3 3 4 5 | 7 | 1.5 | 0.0 | - | | | Dark grayish brown (10YR 4/2) fine SAND, some Silt, no odor, loose, saturated. | | 2" ID Sch. 40 PVC 0.010" Slotted Screen 8-18' bgs |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected at 0.5-2' and 8-10' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/8/01 | 11.3' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** 43-101R

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | 9 | 16-18 | 2<br>3<br>4<br>4 | 7 | 1.3 | 0.0 | - | SP | | Dark grayish brown (10YR 4/2) fine poorly graded SAND, some Silt, no odor, loose, saturated.. | SAND | #5 Global Filter Sandpack 6-18' bgs<br>2" ID Sch. 40 PVC 0.010" Slotted Screen 8-18' bgs<br>PVC Cap 18-18.2' bgs |
| 20 | 730 | | | | | | | | | | | | |
| 25 | 725 | | | | | | | | | | | | |
| 30 | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected at 0.5-2' and 8-10' bgs.

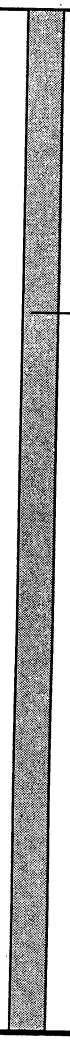
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/8/01 | 11.3' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 10/26/00-10/26/00<br>**Drilling Company:** RAU Drilling<br>**Driller's Name:** Rick Rau<br>**Drilling Method:** Hollow Stem Auger<br>**Bit Size:** NA<br>**Auger Size:** 3.25" ID<br>**Rig Type:** CME 45 B Truck Mounted Dill Rig<br>**Sampling Method:** 2" spoon | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' below grade<br>**Surface Elevation:** 734.5'<br><br>**Geologist:** R. Wagner | **Well/Boring ID:** ACSP-B1<br>ACSP-TW1<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Phase II ESA<br>AC Sparkplug Property |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N-Values | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | | | | | | | | | |
| 0 | | 1 | 0-2 | 1.2 | 7, 10, 11, 11 | 21 | 6.6 | | | Dark brown fine to medium SAND, little coarse Sand and fine Gravel, moist, little Silt. Fill. |
| | | 2 | 2-4 | 1.5 | 4, 5, 32, - | 37 | 8.3 | | | Brown to black fine SAND, little Silt and medium to coarse Sand, moist. |
| | | | | | | | | | | SLAG. |
| 5 | 730 | 3 | 4-6 | 0.9 | 40, 34, 32, 50/0 | 66 | 9.6 | | | CONCRETE with little medium to coarse Sand, trace Coal and Wood fragments, moist. Fill. |
| | | 4 | 6-8 | 0.0 | 7, 12, 17, 39 | 29 | NA | | | No Recovery, Concrete debris. |
| 10 | 725 | 5 | 8-10 | 0.2 | 100/0.5 | NA | 11.2 | | | WOOD and CONCRETE, moist. |
| | | 7 | 10-12 | 0.2 | 100/0.2 | NA | 10.2 | | | As above, little fine to medium Sand, moist. Augered-Concrete from 8-10.5'. |
| | | 8 | 12-14 | 2.0 | 14, 17, 41, 50 | 58 | 9.1 | | | Light brown Silty fine SAND, little coarse Sand and fine Gravel embedded, very dense, wet. |
| 15 | 720 | 9 | 14-16 | 2.0 | 23, 44, 44, 29 | 88 | 22.8 | X | | As above, wet, very dense. |

**Well/Boring Construction**



Borehole backfilled with Bentonite chips.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Sample ACSP-B1 (14-16') submitted for VOCs & Metals (Mich. 10) analysis. Borehole terminated at 16'. Temp. 2" diam. PVC well with 10 slot, 5' screen was set in soil boring. ACSP-TW1 water sample collected for VOCs, SVOCs, Metals (Mich. 10), and PCBs. ACSP-TW-DUP-1 duplicate sample was collected for Metals.

| | | |
|---|---|---|
| **Date Start/Finish:** 10/26/00-10/26/00<br>**Drilling Company:** RAU Drilling<br>**Driller's Name:** Rick Rau<br>**Drilling Method:** Hollow Stem Auger<br>**Bit Size:** NA<br>**Auger Size:** 3.25" ID<br>**Rig Type:** CME 45 B Truck Mounted Dill Rig<br>**Sampling Method:** 2" spoon | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' below grade<br>**Surface Elevation:** 739.4'<br><br>**Geologist:** Raymond Wagner | **Well/Boring ID:** ACSP-B2<br>ACSP-TW2<br><br>**Client:** General Motors<br><br>**Location:** GM-Flint - Phase II ESA<br>AC Sparkplug Property |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N-Values | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | |
| 0 | | 1 | 0-2 | 1.2 | 5 5 12 6 | 17 | 30.9 | | | Dark brown medium to coarse SAND and fine Gravel, some Brick and Concrete fragments, little Silt, moist. [FILL] | |
| | | 2 | 2-4 | 1.8 | 2 2 4 3 | 6 | 37.2 | | | Brown fine SAND (SM), some Silt, little medium to coarse Sand, wet, loose. | |
| 5 | 735 | 3 | 4-6 | 1.6 | 2 4 4 4 | 8 | 39.4 | | | Brown SILT (ML), little fine to medium Sand, trace Clay, moist, loose. | Borehole backfilled with Bentonite chips. |
| | | 4 | 6-8 | 1.8 | 2 2 5 6 | 7 | 42.1 | | | As above, moist, loose. | |
| 10 | 730 | 5 | 8-10 | 1.7 | 3 5 5 6 | 10 | 23.6 | | | | |
| | | 7 | 10-12 | 1.6 | 3 3 4 6 | 7 | 48.7 | | | | |
| | | 8 | 12-14 | 1.7 | 2 2 4 4 | 6 | 812 | | | Brown to gray SILT (ML), little fine Sand, trace coarse Sand, moist, slight hydrocarbon odor noticed. Possibly glacial-alluvial. | |
| 15 | 725 | 9 | 14-16 | 1.9 | 2 2 4 4 | 6 | 2852 | X | | Brown to gray fine Silty SAND, little coarse Sand and Clay, slight degraded hydrocarbon odor, moist. Possibly glacial-alluvial. | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Sample ACSP-B2 (14-16') submitted for VOCs, SVOCs, & Metals (Mich. 10) analysis. ACSP-DUP-1 submitted for SVOCs & VOCs. MS/MSD submitted for SVOC analysis. Borehole terminated at 18'. Temporary 2" diam. PVC well with 10 slot, 5' screen was set in soil boring. ACSP-TW2 temporary well was dry, no sample collected.

**Client:**
General Motors

**Site Location:**
GM-Flint - Phase II ESA
AC Sparkplug Property

**Well/Boring ID:** ACSP-B2

**Borehole Depth:** 18' below grade

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N - Value | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 16-18 | 1.8 | 2 5 7 12 | 12 | 2711 | | | Brown to gray SILT (ML), little fine Sand and Clay, trace coarse Sand, degraded hydrocarbon odor, moist to wet. Possibly glacial-alluvial. | Borehole backfilled with Bentonite chips. |
| 20 | 720 | | | | | | | | | | |
| 25 | 715 | | | | | | | | | | |
| 30 | 710 | | | | | | | | | | |
| 35 | 705 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Sample ACSP-B2 (14-16') submitted for VOCs, SVOCs, & Metals (Mich. 10) analysis. ACSP-DUP-1 submitted for SVOCs & VOCs. MS/MSD submitted for SVOC analysis. Borehole terminated at 18'. Temporary 2" diam. PVC well with 10 slot, 5' screen was set in soil boring. ACSP-TW2 temporary well was dry, no sample collected.

| | | |
|---|---|---|
| **Date Start/Finish:** 5/08/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** ACSP-B2C<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-2 | 5 7 7 5 | 14 | 1.6 | 5.2 | - | ML | | Brown (10YR 4/3) aplastic SILT, little fine to coarse subangular Sand, Gravel, and rubble, little to some Clay; moist, loose organic matter (roots) and topsoil, no odor. At 1.2-2' very dark brown 10YR 2/2 aplastic SILT, some light yellow brown (10YR 6/9) aplastic fine to medium Sand, moist, moderately loose to moderately dense. | SILT | |
| | | 2 | 2-4 | 4 7 9 13 | 16 | 1.3 | 6.7 | - | CL | | Brown (10YR 3/3) with gray (10YR 5/1) mottling hard CLAY, some to little medium subangular Sand, some Silt, trace to few fine to coarse subrounded Gravel, dry, hard, no odor. | CLAY and SILTY CLAY | |
| 5 | 5 | 3 | 4-6 | 6 9 10 12 | 19 | 1.3 | 2.4 | - | | | Yellow brown (10YR 4/4) plastic Silty CLAY, little fine to medium subangular Sand, moist to wet, soft, no odor. | | Borehole backfilled with bentonite to grade. |
| | | 4 | 6-8 | 3 9 15 27 | 24 | 1.3 | 4.3 | - | | | CLAY as at 2.0-5.6' bgs, hard.<br>Silty CLAY as at 5.6-6.9' bgs.<br>Hard CLAY as at 2-5.6' bgs. | | |
| | | 5 | 8-10 | 9 28 28 39 | 56 | 2.0 | 5.0 | - | | | | | |
| 10 | 10 | 6 | 10-12 | 9 38 50 5 | 88 | 1.4 | 4.8 | - | | | | | |
| | | 7 | 12-14 | 8 19 21 28 | 40 | 1.6 | 2.0 | - | ML | | Light yellow brown (10YR 6/4) aplastic, fine to coarse subangular SAND (SP), some Gravel, some to little Silt, dry, loose, no odor.<br>Very dark brown (10YR 7/4) aplastic fine to medium Silty SAND, trace Clay, dry, moderately loose, no odor. Moist to damp at 14' bgs, saturated at 17.8' bgs. | SILTY SAND | |
| 15 | 15 | 8 | 14-16 | 11 12 19 22 | 31 | 1.5 | 2.4 | - | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 8-10' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/10/01 | 17.8' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** ACSP-B2C

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 8 11 15 11 | 26 | 2.0 | 2.4 | - | ML | | Very dark brown (10YR 7/4) aplastic fine to medium Silty SAND, trace Clay, dry, moderately loose, no odor. Moist to damp at 14' bgs, saturated at 17.8' bgs. 18.7-19.2 same as above, fine to coarse Gravel. | SILTY SAND | |
| | | 10 | 18-20 | 9 38 25 26 | 63 | 4.4 | 1.7 | - | | | | | |
| 20 | 20 | | | | | | | | | | Hard CLAY (CL) as at 2-5.6' bgs but dark yellow brown (10YR 4/4). | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 8-10' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/10/01 | 17.8' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 08/17/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 29' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** ACSP-B2D<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-2 | 6 6 9 8 | 15 | 1.3 | 1.1 | - | ML | | Medium dense, dark gray-brown (10 YR 4/2) SILT, some to little Clay, few fine to coarse subrounded Sand, trace fine to medium round Gravel, no odor, aplastic, dry, organic matter. Topsoil | Topsoil | |
| | | 2 | 2-4 | 10 10 12 15 | 22 | 1.0 | 0.1 | - | | | Medium dense, dark gray-brown (10 YR 4/2) changing to pale brown (10 YR 7/4) SILT, no organic matter. | SILT | |
| 5 | 5 | 3 | 4-6 | 5 8 8 9 | 16 | 1.5 | 2.3 | - | | | Yellow-brown (10 YR 5/4), some clay, damp. | | |
| | | 4 | 6-8 | 6 9 9 11 | 18 | 1.8 | 1.9 | - | CL | | Very stiff, yellow-brown (10YR 5/4) Silty CLAY, litte fine to coarse subangular to subrounded Sand, few fine to coarse rounded to subrounded Gravel, no odor, damp. | SILTY CLAY | |
| | | 5 | 8-10 | 9 17 44 31 | 61 | 0.5 | 0.0 | - | | | Gravel as cobbles. | | |
| 10 | 10 | 6 | 10-12 | 4 15 25 32 | 40 | 2.0 | 0.0 | - | | | Hard | | Borehole tremie grouted. |
| | | 7 | 12-14 | 9 18 28 32 | 46 | 2.0 | 0.0 | - | | | Very dense, light yellow-brown (10 YR 6/4) SILT, few fine subangular Sand, little Clay, no odor, aplastic, damp. | SILT | |
| 15 | 15 | 8 | 14-16 | 6 16 17 18 | 33 | 1.8 | 0.0 | - | | | Dense, yellow-brown (10 YR 5/4) Silty CLAY, some fine to medium subrounded Sand, moist. | silty clay | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected at 0-2', 2-4', 4-6', 14-16' and 24-26' bgs

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/17/01 | 27.8' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** ACSP-B2D

**Borehole Depth:** 29' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 11 14 22 25 | 36 | 2.0 | 0.0 | - | CL | | Dense, yellow-brown (10 YR 5/4) Silty CLAY, some fine to medium subrounded Sand, moist. | | |
| | | | | | | | | | SW | | Dense, light yellow-brown (10 YR 6/4), fine to medium SAND, some Silt, few Clay, no odor, aplastic, dry to damp. | | |
| | | | | | | | | | CL | | Dense, yellow-brown (10 YR 5/4) Silty CLAY, some to little Sand. | | |
| | | 10 | 18-20 | 7 12 19 32 | 31 | 2.0 | 0.0 | - | ML | | Dense, gray (10 YR 5/1) SILT, some Clay, fine to coarse subangular to subrounded Sand, fine to medium rounded to subrounded Gravel, no odor, aplastic, moist. | SILT and CLAY | |
| 20 | 20 | 11 | 20-22 | 31 50/ 0.5' NA | NA | 0.7 | 0.0 | - | | | Very dense, gray-brown (10 YR 5/1) Silty fine to medium subangular to subrounded SAND lenses throughout, few to little Clay, moist. | | |
| | | 12 | 22-24 | 12 20 50/ 0.4' | 70 | 0.9 | 0.0 | - | | | Moist to wet. | | |
| 25 | 25 | 13 | 24-26 | 11 23 20 24 | 43 | 2.0 | 0.0 | - | ML/CL | | Increased clay to a SILT with Clay, damp to dry. | | Borehole tremie grouted. |
| | | 14 | 26-28 | 24 34 50/ 0.6' | 84 | 1.5 | 0.0 | - | | | Moist. | | |
| | | 15 | 28-29 | 36 50/ 0.5' | NA | 1.0 | 0.0 | - | | | Silty SAND lenses 8" wide as at 21' bgs, wet. | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected at 0-2', 2-4', 4-6', 14-16' and 24-26' bgs

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/17/01 | 27.8' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 08/20/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 26' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** ACSP-B2E<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-2 | 3 4 7 9 | 11 | 1.0 | 0.0 | - | ML | | Dense, brown-yellow (10 YR 6/6) SILT, little fine subangular to subrounded Sand, few Clay, no odor, aplastic, organic matter, damp with rainfall. Topsoil | Topsoil | |
| | | 2 | 2-4 | 9 7 11 13 | 18 | 1.0 | 0.0 | - | | | Dense, brown (10 YR 5/3) SILT, some Clay, little fine to medium subrounded Sand, no odor, aplastic, dry. Old root structure present along with wooden debris. Former topsoil horizon.<br>Few fine to coarse subrounded gravel, no root structures. Till. | SILT | |
| 5 | 5 | 3 | 4-6 | 9 10 13 15 | 23 | 1.5 | 0.1 | - | | | | | |
| | | 4 | 6-8 | 6 10 12 19 | 22 | 2.0 | 0.0 | - | | | | | |
| | | 5 | 8-10 | 7 9 19 23 | 28 | 1.8 | 0.0 | - | CL | | Hard to very stiff, brown (10 YR 5/3) Silty CLAY, little to few fine to coarse subangular to subrounded Sand, few fine to coarse subrounded to rounded Gravel, no odor, heavily oxidized, dry. Till. | SILTY CLAY | Borehole tremie grouted. |
| 10 | 10 | 6 | 10-12 | 10 20 22 27 | 42 | 1.0 | 0.0 | - | | | | | |
| | | 7 | 12-14 | 7 9 15 23 | 24 | 2.0 | 0.0 | - | ML | | Dense, gray (10 YR 5/1) SILT, some to little Clay, no odor. | SILT | |
| 15 | 15 | 8 | 14-16 | 4 9 13 16 | 22 | 2.0 | 0.0 | - | | | Medium dense, brown (10 YR 5/5) SILT, aplastic. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected at 0-2' and 8-10' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/20/01 | 25.9' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** ACSP-B2E

**Borehole Depth:** 26' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 34 50/ 0.6' NA | NA | 1.0 | 0.0 | - | ML | | Medium dense, brown (10 YR 5/5) SILT, aplastic, some fine to medium subangular Sand. | SILT | |
| | | 10 | 18-20 | 6 13 20 23 | 33 | 1.5 | 0.0 | - | | | | | |
| 20 | 20 | 11 | 20-22 | 13 19 23 29 | 42 | 2.0 | 0.0 | - | | | Gray (10 YR 5/1), little fine to medium subangular sand. | | |
| | | | | | | | | | CL | | Hard to very stiff, gray (10 YR 5/1) CLAY as at 8.5-14.4' bgs. Clay Till. | CLAY | |
| | | 12 | 22-24 | 6 11 14 22 | 25 | 2.0 | 0.0 | - | ML | | Very dense, gray (10 YR 5/1) SILT, no odor, damp to moist. Till. | SILT | Borehole tremie grouted. |
| 25 | 25 | 13 | 24-26 | 13 31 50/ 0.6' | NA | 1.5 | 0.0 | - | | | at 25.9': Gray (10 YR 5/1) Silty fine to medium subangular to subrounded SAND lens/seam, few clay, no odor, saturated, moderately dense. | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected at 0-2' and 8-10' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/20/01 | 25.9' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 10/26/00-10/26/00<br>**Drilling Company:** RAU Drilling<br>**Driller's Name:** Rick Rau<br>**Drilling Method:** Hollow Stem Auger<br>**Bit Size:** NA<br>**Auger Size:** 3.25" ID<br>**Rig Type:** CME 45 B Truck Mounted Dill Rig<br>**Sampling Method:** 2' x 2" ID | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 735.2'<br><br>**Geologist:** Raymond Wagner | **Well/Boring ID:** ACSP-B3<br>ACSP-TW3<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Phase II ESA<br>AC Sparkplug Property |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N-Values | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 735 | 1 | 0-2 | 1.3 | 8 12 8 7 | 20 | 30.7 | | | Dark brown medium SAND, little Slag and fine Sand, dry. [FILL] | |
| | | 2 | 2-4 | 0.7 | 2 3 3 3 | 6 | 16.2 | | | As above, with some Concrete fragments, dry, loose. [FILL] | |
| 5 | 730 | 3 | 4-6 | 0.3 | 5 50/0. | NA | 45.6 | | | WOOD, little fine to medium Sand, moist. [FILL] | Borehole backfilled with Bentonite chips to grade. |
| | | 4 | 6-8 | 0.4 | H H 1 3 | 4 | 3.1 | | | Black SILT, Wood, little fine to medium Sand. [FILL] | |
| | | 5 | 8-10 | 1.5 | 3 5 9 10 | 14 | 34.4 | | | Light brown fine SAND, little Silt and medium Sand, trace Metal fragments, moist. [FILL] | |
| 10 | 725 | 7 | 10-12 | 1.7 | 5 8 8 6 | 16 | 48.6 | X | | As above, firm, moist. | |
| | | 8 | 12-14 | 1.4 | 16 25 50 - | 75 | 37.5 | | | Light brown SILT, some fine Sand, compact, wet. | |
| 15 | 720 | 9 | 14-16 | 1.6 | 23 39 50/ 0.5 | - | 44.4 | | | Light brown fine SAND, little Silt, wet. | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Sample ACSP-B3 (10-12) submitted for VOCs & Metals (Mich 10) analysis. Also collected MS/MSD for SVOCs & VOCs, & DUP-1 for Metals (Mich. 10). Temporary 2" diam. PVC well with 5', 10 slot screen was set in boring. ACSP-TW3 was collected for VOCs, SVOCs, Metals (Mich. 10) & PCBs. ACSP-TW-DUP-1 was collected for VOCs, SVOCs, & PCBs & MS/MSD for VOCs.

**Client:**
General Motors

**Site Location:**
GM-Flint - Phase II ESA
AC Sparkplug Property

**Well/Boring ID:** ACSP-B3

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N - Value | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 16-18 | 1.8 | 19 28 23 29 | 56 | 32.1 | | | Brown SAND and SILT grading to gray SILT with little coarse Sand and fine Gravel with medium to coarse Sand embedded, compact, moist to wet. | Borehole backfilled with Bentonite chips to grade. |
| 20 | 715 | | | | | | | | | | |
| 25 | 710 | | | | | | | | | | |
| 30 | 705 | | | | | | | | | | |
| 35 | 700 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Sample ACSP-B3 (10-12) submitted for VOCs & Metals (Mich 10) analysis. Also collected MS/MSD for SVOCs & VOCs, & DUP-1 for Metals (Mich. 10). Temporary 2" diam. PVC well with 5', 10 slot screen was set in boring. ACSP-TW3 was collected for VOCs, SVOCs, Metals (Mich. 10) & PCBs. ACSP-TW-DUP-1 was collected for VOCs, SVOCs, & PCBs & MS/MSD for VOCs.

| | | |
|---|---|---|
| **Date Start/Finish:** 5/18/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 562751.91<br>**Easting:** 13306108.28<br>**Casing Elevation:** 735.06<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** 735.29<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-02-07<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 735 | 1 | 0-2 | NA<br>2<br>2<br>4 | 4 | 1.1 | 0.2 | - | FL | | CONCRETE. | FILL |
| | | | | | | | | | SP | | Dark yellow brown (10 YR 4/4) fine to medium subrounded to subangular SAND, mostly medium-grained, little Silt, trace Clay, aplastic, no odor, wet, moderately loose. | SAND |
| | | 2 | 2-4 | 1 | NA | NA | NA | - | FL | | CONCRETE. | FILL |
| 5 | 730 | 3 | 4-6 | 4<br>6<br>8<br>12 | 14 | 1.7 | 1.8 | - | CL | | Gray (10YR 5/1) CLAY, with extensive brown (10YR 5/3) mottling/oxidation along fractures and fracture selvages, some Silt, little fine to medium subrounded to subangular Sand, few to trace fine to coarse rounded Gravel, no odor, dry, hard (pp=>4.5 tons/sq. feet). Clay Till. | CLAY |
| | | 4 | 6-8 | 3<br>7<br>9<br>9 | 16 | 2.0 | 1.0 | - | | | 2" wide zone bleached to light gray (10 YR 7/1). | |
| | | 5 | 8-10 | 2<br>11<br>12<br>15 | 23 | 1.7 | 0.9 | - | | | Decreased mottling.<br>Increased mottling. | |
| 10 | 725 | 6 | 10-12 | 17<br>17<br>17<br>55 | 34 | 1.8 | 4.5 | - | SP | | Yellow brown (10 YR 5/6) fine to coarse subrounded to subangular SAND, some Silt, little to few Clay, no odor, wet, moderately loose to moderately dense. | SAND |
| | | | | | | | | | CL | | Homogeneous dark gray (10 YR 4/1) CLAY, some Silt, little fine to medium subangular to subrounded Sand, few fine to coarse rounded Gravel, no odor, dry, hard (pp=>4.5 tons/sq. feet). Clay Till. | CLAY |
| 15 | 720 | | | | | | | | | | | |

**Boring Construction**

- Cement pad with 9" diam. flush-mount cover
- Grout 0.9-4' bgs
- Bentonite seal 4-5' bgs
- 2" ID Sch. 40 PVC riser 0.2-6.8' bgs
- #5 Global filter sand pack 5-12' bgs
- 2" ID Sch. 40 PVC 0.010"slottedscreen 6.8-11.8' bgs

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.9-2', 4-6', and 6-8' bgs.

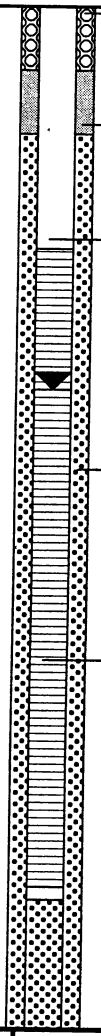
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/21/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 563017.65<br>**Easting:** 13306187.7<br>**Casing Elevation:** 735.82<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 735.99<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-02-08<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | FL | | CONCRETE. | FILL |
| | 735 | 1 | 0-2 | NA<br>6<br>15<br>21 | 21 | 0.7 | 2.9 | - | ML | | Gray (10 YR 6/1) SILT, some fine to coarse subangular Sand, trace Clay, few fine to coarse subangular Gravel and wooden debris, aplastic, no odor, dry, loose. Fill. | |
| | | 2 | 2-4 | 14<br>12<br>12<br>14 | 24 | 1.0 | 1.2 | - | | | | |
| | | | | | | | | | SP | | Yellow-brown (10 YR 5/8) fine to medium SAND, some Silt, few Clay, aplastic, no odor, moist, moderately dense. | SAND |
| 5 | 730 | 3 | 4-6 | 4<br>9<br>13<br>13 | 22 | 1.8 | 1.6 | - | CL | | Dark gray (10 YR 4/1) CLAY, some Silt, little fine to medium subrounded Sand, few to trace fine to coarse subrounded to rounded Gravel, no odor, dry, hard (pp=4.5 tons/sq. feet). Locally mottled along fractures and selvages to yellow-brown (10 YR 5/6). | CLAY |
| | | 4 | 6-8 | 5<br>9<br>8<br>8 | 17 | 2.0 | 3.5 | - | ML | | Gray (10 YR 6/1) SILT, some Clay, little fine subangular Sand, aplastic, no odor, wet, moderately dense. | SILT |
| | | 5 | 8-10 | 5<br>7<br>7<br>8 | 14 | 1.5 | 4.3 | - | | | | |
| 10 | 725 | 6 | 10-12 | 4<br>4<br>5<br>6 | 9 | 1.8 | 1.1 | - | SP | | Gray-brown (10 YR 5/2) fine to coarse subangular SAND, little Silt, few to trace Clay, aplastic, no odor, wet, moderately loose.<br>Fine subangular SAND, some Silt, trace Clay, aplastic, no odor, wet, loose. | SAND |
| | | 7 | 12-14 | 7<br>12<br>15<br>17 | 27 | 2.0 | 1.0 | - | | | | |
| 15 | | 8 | 14-16 | 31<br>50/<br>5" | NA | 1.2 | 1.6 | - | ML | | Same as 9.8-10.5' bgs, moist to damp. | SILT |
| | 720 | | | | | | | | CL | | Gray (10 YR 4/1) CLAY, some Silt, little fine to medium subangular to subrounded Sand. | |

**Boring Construction**



- Cement pad with 9" diam. flush-mount cover
- Bentonite seal 1-2' bgs
- 2" ID Sch. 40 PVC riser 0.2-3.8' bgs
- #5 Global filter sand pack 2-18' bgs
- 2" ID Sch. 40 PVC 0.010"slottedscreen 3.8-13.8' bgs

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.7-2' and 4-6' bgs.
pp=pocket penetrometer

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/21/01 | 6.0' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-02-08

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 25<br>34<br>37<br>47 | 71 | NA | 1.4 | - | CL | | subangular to subrounded Sand.<br>Gray (10 YR 4/1) CLAY, some Silt, little fine to medium subangular to subrounded Sand, few fine to coarse subrounded to rounded Gravel, no odor, dry, hard. Clay Till. | CLAY | #5 Global filter sand pack 2-18' bgs |
| 20 | 715 | | | | | | | | | | | | |
| 25 | 710 | | | | | | | | | | | | |
| 30 | 705 | | | | | | | | | | | | |
| 35 | 700 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.7-2' and 4-6' bgs.
pp=pocket penetrometer

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/21/01 | 6.0' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 9/6/01-9/7/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** Truck-Mounted Geoprobe<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** Direct Push | **Northing:** 562080.10<br>**Easting:** 13305714.33<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 3.7' bgs<br>**Surface Elevation:** 738.71<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-02-09<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | CONCRETE. | | |
| | | 1 | 1.7-3.7 | 2.0 | 0.0 | - | CL | | Yellow brown (10YR 5/4) Silty lean CLAY, little fine to coarse subangular Sand, trace fine subrounded Gravel, no odor, damp, moderately stiff. Clay Till. | CLAY | Borehole backfilled to grade with Bentonite. |
| | | | | | | | SP | | Black 10YR 2/1 angular medium- to coarse-grained poorly graded SAND, some to little Silt, few Clay, no odor, loose, dry. . | | |
| | | | | | | | CL | | Silty lean CLAY, as above at 1.7-2.5' bgs. | CLAY | |
| 5 | 5 | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Sample collected 1.7-3.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 9/7/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** Truck-Mounted Geoprobe<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** Direct Push | **Northing:** 562055.96<br>**Easting:** 13305733.91<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 3.3' bgs<br>**Surface Elevation:** 738.79<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-02-10<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | FL | | CONCRETE. | FILL | |
| | | 1 | 1.3-3.3 | 2.0 | 0.0 | - | SM | | Black (10YR 2/1) Silty SAND, fine subangular Sand, few Clay, earthy odor, damp, moderately dense. Fill. | SILTY SAND | Borehole backfilled to grade with Bentonite. |
| 5 | 5 | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Sample collected 1.3-3.3' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:**<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 559227.43<br>**Easting:** 13305409.17<br>**Casing Elevation:** 725.95<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 725.92<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-04R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 725 | 1 | 0-2 | - 39 25 15 | 64 | 1.4 | 14.7 | + | ML | | Light brown-gray SILT, some fine to medium Sand, little fine to coarse Gravel, trace organic matter, damp, dense [Fill/Topsoil]. | SILT | Cement pad with 9" diam. flush-mount cover. |
| | | 2 | 2-4 | 12 15 10 8 | 25 | 1.5 | 5.9 | - | | | Black SILT, some fine to coarse SAND, little fine to medium Gravel and Clay, dry, dense. | | 2" ID Sch. 40 PVC riser 0-14' bgs. |
| 5 | 720 | 3 | 4-6 | 2 4 5 6 | 9 | 1.8 | 10.2 | - | | | Gray-brown SILT, little fine to medium Sand, trace Clay, saturated, dense. | | |
| | | 4 | 6-8 | 3 4 7 7 | 11 | 1.9 | 4.3 | - | | | | | |
| | | 5 | 8-10 | 3 4 4 11 | 8 | 2.0 | 1.0 | - | | | | | Grout 1-11' bgs. |
| 10 | 715 | 6 | 10-12 | 4 12 13 15 | 25 | 1.5 | 1.5 | - | SP | | Yellow-brown fine to coarse SAND, little Silt and fine to medium Gravel, saturated, loose. | SAND | |
| | | 7 | 12-14 | 19 17 17 12 | 34 | 1.3 | 3.4 | - | | | | | Bentoniteseal11-13' bgs. |
| 15 | 710 | | | | | | | | | | | | #5 Global filter sandpack 13-19' bgs.<br>2" ID Sch. 40 PVC 0.010"slottedscreen 14-19' bgs. |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Stratigraphic Descriptions are from RFI-09-04.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 9/7/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** Truck-Mounted Geoprobe<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** Direct Push | **Northing:** 562031.95<br>**Easting:** 13305705.47<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 3.7' bgs<br>**Surface Elevation:** 738.88<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-02-11<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | FL | | CONCRETE. | FILL | |
| | | 1 | 1.7-3.7 | 1.5 | 0.0 | - | SM | | Very dark gray-brown (10YR 3/2) Silty SAND, fine to coarse subangular Sand, little Clay, few fine to coarse subrounded Gravel, no odor, damp, moderately dense. | SAND | Borehole backfilled to grade with Bentonite. |
| 5 | 5 | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Sample collected 1.7-3.7' bgs.

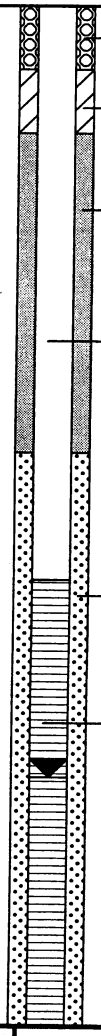
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 8/1/01 - 8/2/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 45C skidrig | **Northing:** 565423.87<br>**Easting:** 13305850.44<br>**Casing Elevation:** 748.38<br><br>**Borehole Depth:** 21' bgs<br>**Surface Elevation:** 748.65<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-03-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 750 | | | | | | | | | | | |
| 0 | | | NA | NA | NA | NA | NA | NA | | | Reinforced concrete. | FILL |
| | 745 | 1 | 2-4 | 1 1 1 1 | 2 | 1.0 | 4638 | - | SM | | Very dark gray-brown (10 YR 5/2) Silty fine to medium subangular to subrounded SAND, trace Clay, aplastic, dry, no odor, loose. | |
| 5 | | 2 | 4-6 | 2 3 3 4 | 6 | 1.2 | >10000 | - | ML | | Yellow-brown (10 YR 5/6) SILT, some to little fine subangular to subrounded Sand, few Clay, aplastic, no odor, damp, moderately loose to loose. Increased clay content to some with depth. | SILT |
| | | 3 | 6-8 | 2 4 4 6 | 8 | 1.5 | >10000 | - | | | Dark brown (10 YR 3/3) fine to medium subrounded Sandy SILT, trace fine to medium rounded Gravel, little to some Clay, aplastic, no odor, damp, moderately loose. Metallic ash patches up to 1" diameter. | SANDY SILT |
| | 740 | 4 | 8-10 | 2 3 2 2 | 5 | 1.8 | >10000 | + | | | Brown (10 YR 5/3) with very dark brown (10 YR 2/2) mottling alternated with damp to moist areas. Increasing moisture with depth. Local patches of clay to a soft Silty Clay (CL). | |
| 10 | | 5 | 10-12 | 2 2 3 4 | 5 | 1.5 | 3866 | + | SM<br>ML<br>SM<br>CL | | Moderate odor and oily sheen in and on core present, moist.<br>Very dark gray-brown (10 YR 3/2) Silty fine to medium subrounded SAND, aplastic, moderate odor, moist to wet, oily, loose.<br>Sandy SILT as at 5-9.6' bgs, moderate odor.<br>Silty SAND as at 9.6-9.9' bgs, weak odor.<br>Black (10 YR 2/1) Silty CLAY, fine subrounded Sand, trace splintered wood, soft, weak odor, damp. | |
| | 735 | 6 | 12-14 | 2 4 5 7 | 9 | 1.5 | >10000 | + | SM | | Silty SAND as at 9.6-9.9' bgs, moderate odor, oily, wet to moist. | SILTY SAND |
| 15 | | 7 | 14-16 | 4 5 7 10 | 12 | 1.5 | >10000 | + | SP | | Gray (10 YR 6/1) fine to medium SAND, some to little Silt, saturated, weak odor, moderately dense to very dense with depth, fining downwards. Glacial-alluvial. | SAND |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
+ = Positive Test Result
Samples collected 2-4', 8-10' and 10-12' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/1/01 | 12.1 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-03-01

**Borehole Depth:** 21' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 16-18 | NA | NA | NA | NA | NA | SP | | Gray (10 YR 6/1) fine to medium SAND, some to little Silt, saturated, weak odor, moderately dense to very dense with depth, fining downwards. Glacial-alluvial. | SAND | 2" ID Sch. 40 PVC 0.010" slotted screen 9-19' bgs |
| | 730 | 9 | 18-19 | NA | NA | 0.0 | NA | NA | | | No recovery. CLAY from 17-18' bgs per drillers. | | #5 Global filter sand pack 7-19.2' bgs |
| 20 | | 10 | 19-21 | 4<br>4<br>4<br>4 | 8 | 2.0 | >10000 | + | | | | | Natural collapse 19.2-21' bgs |
| | | | | | | | | | CL | | Gray (10 YR 6/1) Silty CLAY, trace fine subangular to subrounded Sand, plastic, no odor, damp, very stiff to stiff. Clay Till. | | |
| | 725 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
+ = Positive Test Result
Samples collected 2-4', 8-10' and 10-12' bgs.

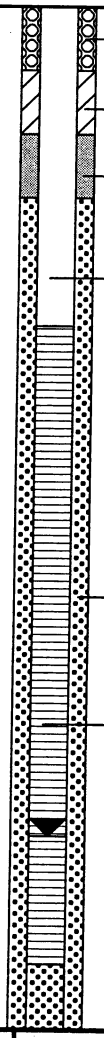
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/1/01 | 12.1 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06-25-01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 565083.74<br>**Easting:** 13306166.78<br>**Casing Elevation:** 792.35<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 742.62<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-03-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | |
| 0 | | | | | | | | | GP | | Coarse gray angular to pebble sized fossilferous limestone GRAVEL, loose, dry. | GRAVEL |
| | 740 | 1 | 1-3 | 9<br>16<br>16<br>9 | 32 | 1.5 | 793 | - | SM | | Dark yellow brown (10 YR 4/1) Silty SAND and fine subangular SAND, no odor, moderately dense to dense, damp to dry, becomes yellow brown (10 YR 5/6), moist at 5'. Fill. | SILTY SAND |
| 5 | | 2 | 3-5 | 8<br>7<br>6<br>5 | 13 | 2 | 1163 | - | | | | |
| | | 3 | 5-7 | 1<br>1<br>1<br>2 | 2 | 1.6 | 339 | - | | | | |
| | 735 | 4 | 7-9 | 4<br>5<br>8<br>20 | 13 | 2 | 86.8 | - | | | Saturated. | |
| 10 | | 5 | 9-11 | 5<br>5<br>5<br>5 | 10 | 2 | 129 | + | SP | | Fine to medium subangular to subrounded SAND, trace coarse rounded Sand. | SAND |
| | 730 | 6 | 11-13 | 3<br>4<br>3<br>2 | 7 | 1.8 | 76.9 | - | | | | |
| | | 7 | 13-15 | 2<br>2<br>3<br>3 | 5 | 1.8 | 132 | - | | | | |
| 15 | | 8 | 15-17 | 2<br>2 | 5 | 0.8 | 82.7 | - | CL | | Gray (10 YR 4/1) CLAY, becoming stiff with depth, some Silt, little fine to medium subangular to subrounded Sand, trace fine to medium subrounded to rounded Gravel, no odor, damp, becoming dry with depth. Till. | CLAY |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3', 3-5' and 5-7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/25/01 | 7.0 | |

Project: 64410.022 Template: j:\rockware\logplot2001\logfiles\64410\auger_well2.ldf
Data File: RFI-03-02.dat Date: 8/8/01

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-03-02

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 15-17 | 3<br>3 | 5 | 0.8 | 82.7 | - | CL | | Gray (10 YR 4/1) CLAY, becoming stiff with depth, some Silt, little fine to medium subangular to subrounded Sand, trace fine to medium subrounded to rounded Gravel, no odor, damp, becoming dry with depth. Till. | CLAY | #5 Global filter sand pack 3-17' bgs |
| | 725 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 710 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3', 3-5' and 5-7' bgs.

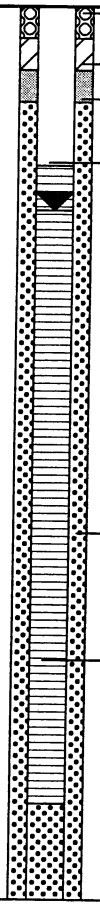
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/25/01 | 7.0 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/22/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Champeron<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 45B | **Northing:** 564987.08<br>**Easting:** 13306022.7<br>**Casing Elevation:** 742.01<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** 742.41<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-03-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | |
| 0 | | | | | | | | | | | |
| | | 1 | 0-2 | n/a n/a 7 12 | 7 | 0.8 | 290 | - | GP | Coarse angular fossiliferous GRAVEL and PEBBLES. Loose, dry, no odor. Fill/ Aggregate. | GRAVEL |
| | 740 | 2 | 2-4 | 10 11 9 7 | 20 | 1.4 | 256 | - | ML | Dark gray brown (10 YR 4/2) aplastic SILT, little fine subangular Sand, trace Clay, no odor, damp, moderately dense. Becomes moist and black (10 YR 2/1) at 1.6' bgs. | SILT |
| | | | | | | | | | GP | Gray brown (10 YR 5/2) medium subangular to subrounded GRAVEL, some fine to coarse subangular to subrounded Sand, trace fine to medium black dense slag, no odor, saturated, loose, aplastic. Fill. | |
| 5 | | 3 | 4-6 | 5 4 3 6 | 7 | 0.2 | NA | - | ML | Light yellow brown (10 YR 6/4) aplastic SILT with black (10 YR 6/4) mottling, some to little fine subangular Sand, no odor, moist to wet, dense. At 5' bgs, some gray (10 YR 2/1) Clay and becomes dense and saturated. | SILT |
| | 735 | 4 | 6-8 | 2 3 2 3 | 5 | 1.0 | 461 | - | | | |
| | | 5 | 8-10 | 3 5 8 7 | 13 | 1.7 | 316 | - | | Gray-black (10 YR 2/1) aplastic SILT (PEAT), some Clay, earthy odor, old roots and organic debris, moist, dense. | |
| 10 | | 6 | 10-12 | 3 5 6 7 | 11 | 1.8 | 81.8 | - | SP | Dark gray (10 YR 4/1) to gray (10 YR 45/1) fine to coarse aplastic subangular to subrounded SAND, little Silt, little to few fine subrounded Gravel, trace shells, no odor, saturated, loose to moderately dense. At 10' bgs, fining downward, no gravel, some Silt. Alluvial/ Riverine sand. | SAND |
| | 730 | 7 | 12-14 | 3 7 11 17 | 18 | 1.7 | 60.1 | - | CL | Gray (10 YR 5/1) CLAY, some Silt, little fine to medium subangular Sand, trace to few fine to medium subrounded to rounded Gravel, no odor, damp, very stiff to stiff. Dry at 13' bgs, stiffness increasing with depth. Clay Till. | CLAY |
| 15 | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0-2' bgs.

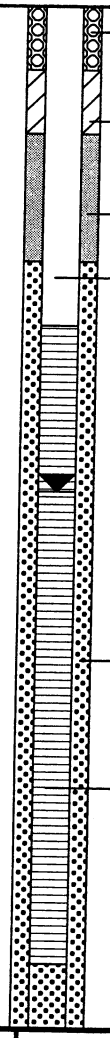
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/22/01 | 3.2' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/23/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 565487.54<br>**Easting:** 13306291.14<br>**Casing Elevation:** 746.67<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 746.85<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-03-04<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | | |
| | 745 | 1 | 0-2 | 27<br>32<br>51/<br>4" | 83 | 1.1 | >10,00 | - | FILL | | Asphalt. | |
| | | | | | | | | | ML | | Very dark gray-brown (10 YR 3/2) SILT, some fine to coarse subrounded to subangular Sand, few Clay, aplastic, dense to very dense, no odor, dry. Wood, metallic debris, slag, and broken glass. Fill. | SILT |
| | | 2 | 2-4 | 4<br>5<br>6<br>5 | 11 | 0.2 | >10,00 | + | | | Damp. | |
| 5 | | 3 | 4-6 | 4<br>6<br>6<br>4 | 12 | 0.3 | 8118 | + | | | Wood debris, reddish-orange Silt, moderate odor. | |
| | 740 | 4 | 6-8 | 4<br>4<br>4<br>4 | 8 | 0.7 | >10,00 | + | | | Moist.<br>Saturated, loose, lightweight silvery metallic angular silt to medium gravel-sized fragments. What appears to be ball bearings were identified. | |
| | | 5 | 8-10 | 2<br>5<br>4<br>5 | 9 | 1.1 | 1496 | - | SM | | Gray-brown (10 YR 5/2) Silty SAND, fine to medium subangular to subrounded Sand, trace Clay, aplastic, moderately loose to loose, no odor, saturated. | SILTY SAND |
| 10 | | 6 | 10-12 | 6<br>6<br>9<br>12 | 15 | 1.5 | 4736 | NA | | | | |
| | 735 | 7 | 12-14 | 4<br>6<br>6<br>6 | 12 | 1.8 | >10,00 | NA | | | | |
| 15 | | 8 | 14-16 | 4<br>5<br>5<br>6 | 10 | 0.5 | 0.0 | NA | ML | | Gray-brown (10 YR 5/2) SILT, little to some Clay, aplastic, dense, no odor, moist to wet.<br>Moist, some Clay. | SILT |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.5-2.5' and 4.5-6.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/29/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 565537.6<br>**Easting:** 13306311.75<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 2.5' bgs<br>**Surface Elevation:** 747.45<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-03-05<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 750 | | | | | | | | | | | | |
| 0 | | | | | | | | | | | Asphalt. | | |
| | | 1 | 0.5-2.5 | 17<br>26<br>34<br>44 | 60 | 1.3 | NA | NA | ML | | Black (10YR 2/1) SILT, some fine to coarse angular Sand, few to little Clay, no odor, very dense, aplastic, damp. Ash and Slag-Fill. | SILT | Borehole backfilled with bentonite 0-2.5' bgs. |
| | 745 | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |
| | 740 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |
| | 735 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0.5-2.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/29/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 565432.32<br>**Easting:** 13306270.11<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 2.5' bgs<br>**Surface Elevation:** 746.28<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-03-06<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | Asphalt. | | |
| | 745 | 1 | 0.5-2.5 | 14<br>16<br>16<br>19 | 32 | 1.7 | NA | NA | ML | | Black (10YR 2/1) SILT, some fine to coarse angular Sand, little Clay, no odor, dense, aplastic, dry. Dark brown (10YR) 1" at upper contact. Slag and Ash - Fill. | SILT | Borehole backfilled with bentonite 0-2.5' bgs |
| 5 | 740 | | | | | | | | | | | | |
| 10 | 735 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0.5-2.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/29/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID HSA<br>**Rig Type:** CME 55 | **Northing:** 565472.3<br>**Easting:** 13306342.32<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 3.0' bgs<br>**Surface Elevation:** 746.19<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-03-07<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | Concrete. | | |
| | 745 | 1 | 1-3 | 19<br>50<br>30<br>25 | 80 | 1.6 | NA | NA | ML | | Black (10YR 2/1) SILT, some fine to coarse angular Sand, few Clay, no odor, very dense, aplastic, damp. Ash and Slag-Fill. | ← SILT → | Borehole backfilled with bentonite 0-2.5' bgs |
| 5 | 740 | | | | | | | | | | | | |
| 10 | 735 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 1-3' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

Project: 64410.039 Template: j:\rockware\logplot2001\logfiles\64410\auger_well2.ldf
Data File: RFI-03-07.dat Date: 1/16/02

| | | |
|---|---|---|
| **Date Start/Finish:** 11/29/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 565429.27<br>**Easting:** 13306238.73<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 2.5' bgs<br>**Surface Elevation:** 747.86<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-03-08<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 750 | | | | | | | | | | | | |
| 0 | | | | | | | | | | | Asphalt. | | |
| | | 1 | 0.5-2.5 | 18 60/4" | NA | 1.3 | 16.8 | NA | ML | | Black (10YR 2/1) SILT, some fine to coarse angular Sand, few Clay, few fine to coarse angular Gravel--all composed of Slag and Ash, weak odor, very dense, aplastic, dry. Ash and Slag Fill. | SILT | Borehole backfilled with bentonite 0-2.5' bgs |
| | 745 | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |
| | 740 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |
| | 735 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0.5-2.5' bgs.

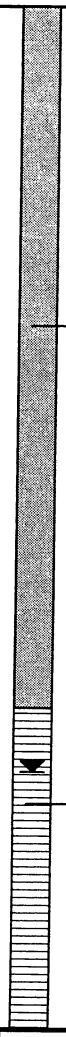
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/04/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 560302.52<br>**Easting:** 13305169.03<br>**Casing Elevation:** 731.03<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 738.48<br><br>**Descriptions By:** SM Duly/SC Kerr | **Boring ID:** RFI-04-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | CONCRETE | FILL |
| | 730 | 1 | 0-2 | 8 9 11 13 | 20 | 1.4 | 1.3 | - | ML | | Brown (10 YR 4/3) SILT with black and very dark brown (10 YR 2/2) mottling, some fine to medium subangular Sand, trace Clay, moderately dense to moderately loose, dry, no odor. | SILT |
| | | 2 | 2-4 | 5 8 12 16 | 20 | 1.6 | 1.2 | - | | | Yellowish brown (10 YR 5/6). | |
| 5 | | 3 | 4-6 | 6 8 11 13 | 19 | 2 | 3.6 | - | | | Few Clay. | |
| | 725 | 4 | 6-8 | 5 7 10 12 | 17 | 1.4 | 2.5 | - | | | | |
| | | 5 | 8-10 | 6 7 6 5 | 13 | 1.4 | 3.6 | - | | | More dense, moist. | |
| 10 | | | | | | | | | | | | |
| | 720 | 6 | 10-12 | 4 4 4 4 | 8 | 1.7 | 2.2 | - | | | | |
| | | 7 | 12-14 | 8 15 20 22 | 35 | 2 | 2.3 | - | SP | | Yellow brown (10 YR 5/6) fine to medium subangular SAND, some Silt, wet, moderately dense, no odor. | SAND |
| 15 | | 8 | 14-16 | 9 22 25 27 | 47 | 1.3 | 0.7 | - | CL | | Dark gray (10 YR 4/1) CLAY, some Silt, few fine to medium subangular Gravel, trace medium Sand, dry, no odor, hard. Clay Till. | CLAY |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Soil samples collected from 1-3' and 9-11' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/04/01 | 12' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-04-01

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-17 | NA<br>NA | NA | NA | NA | NA | CL | | | CLAY | Sand backfill |
| 20 | 710 | | | | | | | | | | | | |
| 25 | 705 | | | | | | | | | | | | |
| 30 | 700 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Soil samples collected from 1-3' and 9-11' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/04/01 | 12' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06-04-01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 560346.41<br>**Easting:** 13305245.43<br>**Casing Elevation:** 730.37<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly/SC Kerr | **Boring ID:** RFI-04-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 730 | | | N/A | | | | | | | Concrete | FILL | |
| | | 1 | 0.7-2.7 | N/A<br>N/A<br>7<br>9 | 7 | 0.9 | 2.1 | - | ML | | Dark yellowish brown (10 YR 4/6) SILT and black mottling, some fine subangular Sand, loose, no odor, aplastic, dry. | SILT and CLAY | |
| | | 2 | 2.7-4.7 | 8<br>11<br>10<br>7 | 21 | 2.8 | 2.8 | - | | | Building debris.<br>Dark gray (10 YR 4/1) CLAY, little Silt, few Sand and Gravel, dry, no odor, hard. | | |
| 5 | 725 | 3 | 4.7-6.7 | 7<br>4<br>5<br>4 | 9 | 1.7 | 1.7 | - | | | SILT as 0.7'-3.9' bgs with Clay lenses as described above up to 1" wide. | | Borehole backfilled with bentonite chips to grade. |
| | | 4 | 6.7-8.7 | 4<br>7<br>8<br>9 | 15 | 1.3 | 1.3 | - | CL | | CLAY as above, but Silty. Silt lenses as above up to 1" wide. Moist at 9.7' bgs. | | |
| 10 | 720 | 5 | 8.7-10.7 | 2<br>3<br>3<br>6 | 6 | 1.6 | 1.6 | - | | | | | Temporary well screen set at 6' - 16' bgs. |
| | | 6 | 10.7-12.7 | 5<br>5<br>6<br>5 | 11 | 1.3 | 1.6 | - | ML-CL | | SILT with Clay lenses as above, saturated, mild odor at 12.4' bgs. | | |
| | | 7 | 12.7-14.7 | 3<br>4<br>5<br>6 | 9 | 1.9 | 4.2 | - | | | Gray (10 YR 5/1) CLAY, some Silt, little fine to medium subangular Sand, trace fine to medium subangular Gravel, no odor, damp, soft. At 12.8' bgs becoming moderately stiff to stiff.<br>Clayey SILT lenses as 6.7-10.7' bgs, moist at 14.9' bgs. | | |
| 15 | 715 | 9 | 14.7-16.7 | 4<br>6<br>7 | 13 | 2 | 2.1 | - | SW | | Gray (10 YR 5/1) fine to coarse subangular SAND, little | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Soil samples collected from 0.7-2.7' and 8.7-10.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/04/01 | 10.7 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-04-02

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 14.7-16.7 | 10 | 13 | 2 | 2.1 | - | CL | | subrounded Gravel, some to little Silt, loose, saturated, no odor. Glacial-Alluvial. | ← CLAY → | |
| | | 10 | 16.7-18 | 8 18 21 | 39 | 1.2 | 0.4 | - | | | Gray CLAY as 12.8-14' bgs, hard. | | Sand backfill from 16' to 18' bgs. |
| 20 | 710 | | | | | | | | | | | | |
| 25 | 705 | | | | | | | | | | | | |
| 30 | 700 | | | | | | | | | | | | |
| 35 | 695 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Soil samples collected from 0.7-2.7' and 8.7-10.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/04/01 | 10.7 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/01/01-06/04/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Ron Camperon<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 560324.69<br>**Easting:** 13305288.42<br>**Casing Elevation:** 730.19<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly/SC Kerr | **Boring ID:** RFI-04-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 730 | | | | | | FL | | CONCRETE. | FILL | |
| | | 1 | 0-2 | 0.8 | 2.9 | - | CL | | Dark Gray brown (10YR 4/2) CLAY. Some Silt with local increases to a Clay with silt. Little fine to medium subrounded to subangular Gravel. No odor, damp, hard. | CLAY | |
| | | 2 | 2-4 | 1.1 | 2.6 | - | ML | | Very dark brown (10YR 2/2) aplastic SILT, some decreasing to little Clay after 2' bgs, little fine to medium Sand (predominantly fine subangular sand). No odor, damp, moderately dense. | SILT | Temp well then backfilled with Bentonite to grade after sampling. |
| 5 | 725 | | 4-6 | n/a | n/a | n/a | FL | | CONCRETE. | FILL | |
| | | 3 | 6-8 | 1.7 | n/a | n/a | CL | | Dark yellowish brown (10YR 4/6) SILTY CLAY, little fine subangular Sand, no odor, hard, damp. | SILTY CLAY | |
| | | 4 | 8-10 | 1.4 | 1.2 | - | | | Silty CLAY as above but dark gray (10YR 4/1) with few fine to medium subrounded Gravel. Saturated at 12.1' bgs. Below 12.1 bgs, 1" wide Silt seams throughout. At 14.2' incerease of fine to coarse Sand content and increase in coarseness of Gravel. | | |
| 10 | 720 | 5 | 10-12 | 1.3 | 1.4 | - | | | Saturated at 12.1' bgs. Below 12.1 bgs, 1" wide Silt seams throughout. | | |
| | | 6 | 12-14 | 1.7 | 1.0 | - | | | | | Screen from 17' to 7' bgs. |
| 15 | 715 | 7 | 14-16 | 2 | 1.4 | - | | | At 14.2' increased fine to coarse subangular Sand and increased coarseness of Gravel to fine to coarse, trace subrounded to subangular pebbles (Fining upward). | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs=below ground surface; PID Background:2 ppm
NA = Not Applicable/Not Available
Refusal at 7.5' bgs. Moved 3'- probably on a footing.
Soil samples from 0.8-2.8', 7-9', and 9-11'.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06-04-01 | 12.1' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-04-03

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 16-18 | 1.7 | 1.4 | - | CL | | As above but damp. | LTY CLA | Screen from 17' to 7' bgs. |
| | | 9 | 18-19 | n/a | 1.1 | - | | | As above but no Silt seams, hard, dry. Glacial Till. | | |
| 20 | 710 | | | | | | | | | | |
| 25 | 705 | | | | | | | | | | |
| 30 | 700 | | | | | | | | | | |
| 35 | 695 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs=below ground surface; PID Background:2 ppm
NA = Not Applicable/Not Available
Refusal at 7.5' bgs. Moved 3'- probably on a footing.
Soil samples from 0.8-2.8', 7-9', and 9-11'.

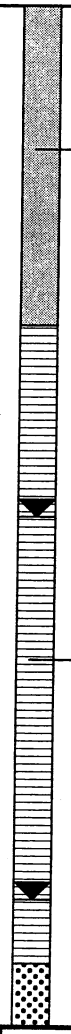
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06-04-01 | 12.1' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/01/01<br>**Drilling Company:** Rau Drillling<br>**Driller's Name:** Rod Camperon<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 561788.64<br>**Easting:** 13305745.70<br>**Casing Elevation:** 738.17<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 738.44<br><br>**Descriptions By:** S.M. Duly | **Boring ID:** RFI-04-04<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-2 | 8<br>11<br>n/a<br>n/a | 11 | 0.5 | 2.8 | | FL | | Concrete | FILL |
| | | | | | | | | | ML | | Black (10 YR 2/1) aplastic SILT, few fine subangular Sand, few Clay. No odor, damp to dry, moderately loose. Fill. | SILT |
| | | 2 | 2-4 | 7<br>6<br>6<br>7 | 12 | 1.5 | 3.2 | | FL | | Concrete | FILL |
| 5 | 5 | 3 | 4-6 | 12<br>6<br>8<br>6 | 14 | 1.9 | 2.1 | | ML | | Yellow-brown 10 YR 5/4 aplastic SILT, little fine to medium Sand (predominantly fine subangular fine Sand), trace Clay. No odor, dry to damp, dense. Fill. At 5.0 ' bgs, local mottled brown (10YR 4/3) and increase in density observed. At 7.0' bgs, increase in moisture content: damp to moist. Saturated at 8.2' bgs. | SILT |
| | | 4 | 6-8 | 7<br>7<br>8<br>9 | 15 | 1.8 | 3.8 | | | | | |
| | | 5 | 8-10 | 4<br>6<br>8<br>10 | 14 | 2 | 2.7 | | | | | |
| 10 | 10 | 6 | 10-12 | n/a | n/a | 1.5 | 3.1 | | CL | | Gray 10 YR 5/1 CLAY, localized mottling with oxidation to yellow-brown 10 YR 5/4, some Silt, little fine to medium subrounded to subangular Sand, trace Gravel. No odor, damp to dry, hard (pp>=4.5 tons/sq. ft). | CLAY |
| | | 7 | 12-14 | 2<br>5<br>3<br>5 | 8 | 1.5 | 3.3 | | SP | | Yellow-brown 10 YR 5/6 fine to medium subangular aplastic SAND (predominantly fine sand), some to little Silt. No odor, moist, moderately dense. Fill. | SAND |
| 15 | 15 | 8 | 14-16 | 2<br>2<br>4<br>4 | 6 | 1.5 | 1.1 | | CL | | Oxidized yellow-brown 10 YR 5/6 hard CLAY as above (9.4'-12.1' bgs) with local increases in Silt lenses up to 1" wide throughout to 15.3' bgs. Below 15.3' bgs the Clay is homogeneous and gray 10 YR 5/1 (native glacial till). | CLAY |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
PID Background = 0.6 ppm
Soil samples from 1.3-2.1', 3.1-5.1', and 5.1-7.1'.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/1/01 | 8' | |
| 6/1/01 | 14' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-04-04

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-17 | n/a | n/a | n/a | n/a | | CL | | | | |
| 20 | 20 | | | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
PID Background = 0.6 ppm
Soil samples from 1.3-2.1', 3.1-5.1', and 5.1-7.1'.

**Water Level Data**

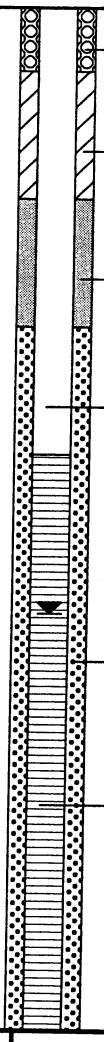
| Date | Depth | Elev. |
|---|---|---|
| 6/1/01 | 8' | |
| 6/1/01 | 14' | |

Project: 64410.022 Template: j:\rockware\logplot2001\logfiles\64410\Auger_well.ldf
Data File:RFI-04-04.dat Date: 7/3/01

| | | |
|---|---|---|
| **Date Start/Finish:** 06/26/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Champeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 566149.89<br>**Easting:** 13305626.59<br>**Casing Elevation:** 750.38<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 750.67<br><br>**Descriptions By:** SM Dully | **Boring ID:** RFI-05-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | 1 | 0-2 | 3 1 2 2 | 3 | 1.3 | >9999 | | FL | | Concrete. | FILL |
| | | 2 | 2-4 | 2 1 1 2 | 2 | 2.0 | 7909 | | SM | | Yellow brown (10YR 5/6) aplastic fine subangular Silty SAND, no to trace Clay, moderately loose to moderately dense, damp, no odor. Fill. | SILTY SAND |
| 5 | 745 | 3 | 4-6 | 2 2 1 2 | 3 | 1.5 | >9999 | | ML | | Dark yellow brown (10 YR 4/6) aplastic SILT, little to some fine to coarse subrounded to subangular Sand (increased roundness with grain size), little to some Clay, moist, moderate dense, no odor. Till. | SILT |
| | | 4 | 6-8 | 1 1 1 1 | 2 | 1.7 | 1508 | | SM | | Yellow brown (10YR 5/6) aplastic fine subangular Silty SAND, moist, saturated at 9.5' bgs. | SILTY SAND |
| | | 5 | 8-10 | 1 1/12' 1 NA | 1/12 | 1.7 | 223 | | | | | |
| 10 | 740 | 6 | 10-12 | NA NA NA NA | NA | 2.0 | 108 | | ML | | Dark yellow brown (10 YR 4/6) aplastic SILT, saturated, local patches of black slightly oily material upto 1" in diameter throughout at 11' bgs, no odor, increased fine to medium rounded gravel, decreased clay to none. | SILT |
| | | 7 | 12-14 | NA NA NA NA | NA | 1.0 | 261 | | | | | |
| 15 | 735 | 8 | 14-16 | NA 1 1 2 | 2 | | 8.8 | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
+ = Positive Test Result
Samples collected 1-3' and 7-9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/26/01 | 9.5 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-05-01

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-17 | | | | | | ML | | Dark yellow brown (10 YR 4/6) aplastic SILT, saturated, local patches of black slightly oily material upto 1" in diameter throughout at 11' bgs, no odor, increased fine to medium rounded gravel, decreased clay to none. | SILT | 2" ID Sch. 40 PVC 0.010"slottedscreen 7-17' bgs. #5 Global filter sandpack 5-17' bgs. |
| 20 | 730 | | | | | | | | | | | | |
| 25 | 725 | | | | | | | | | | | | |
| 30 | 720 | | | | | | | | | | | | |
| 35 | 715 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
+ = Positive Test Result
Samples collected 1-3' and 7-9' bgs.

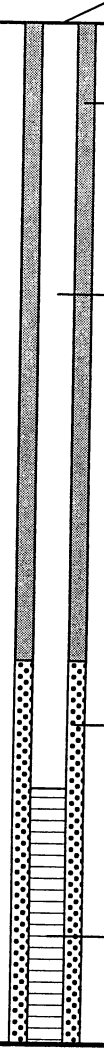
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/26/01 | 9.5 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/23/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Bit Size:**<br>**Auger Size:**<br>**Rig Type:** Geoprobe 66 DT Track Rig<br>**Sampling Method:** 2" diam. + disposable liner<br>**Hammer Weight:** | **Northing:** 566274.16<br>**Easting:** 13305499.50<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 754.10<br><br>**Geologist:** Shawn Kerr | **Well/Boring ID:** RFI-05-02<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-0.8 | - | | NA | | | CONCRETE. |
| | | 2 | 0.8-2 | 1.2 | | NA | * | | Brown fine to medium SAND. |
| | | 3 | 2-4 | 1.8 | | NA | | | |
| 5 | 5 | 4 | 4-6 | 2.0 | | NA | | | Brown fine to medium SAND with Clay.<br>Brown CLAY with brown fine to medium Sand. |
| | | 5 | 6-8 | 0.4 | | NA | | | |
| | | 6 | 8-10 | 1.9 | | NA | * | | Brown fine to medium SAND with Clay.<br>Brown fine to medium SAND. |
| 10 | 10 | 7 | 10-12 | 1.3 | | NA | * | | Brown CLAY with brown fine to medium Sand.<br>Brown fine to medium SAND. |
| | | 8 | 12-14 | 1.5 | | NA | | | As above, moist to wet.<br>As above, wet to saturated. |
| 15 | 15 | 9 | 14-16 | 1.5 | | NA | | | |

**Well/Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Samples collected 0-2', 8-10' and 10-12' bgs.

**Client:**
General Motors

**Site Location:**
GM-Flint - Focused RFI
Factory 36, Building 36

**Well/Boring ID:** RFI-05-02

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 16-18 | 1.4 | | NA | | | | As above, wet to saturated. | Colorado #2040 Silica Sand (10' - 17' bgs)<br>1.5" ID x 1 7/8" OD Sch. 40 PVC 0.010" Slot Screen with 0.011 SS Mesh. (12' - 17' bgs) |
| 20 | 20 | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | |

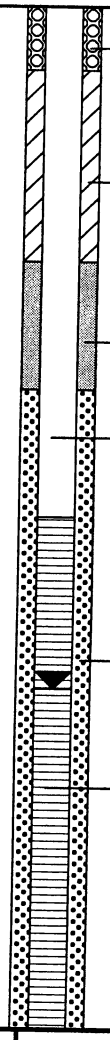
BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Samples collected 0-2', 8-10' and 10-12' bgs.

| | | |
|---|---|---|
| **Date Start/Finish:** 06/26/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 566807.51<br>**Easting:** 13305620.35<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** 752.43<br><br>**Descriptions By:** SM Dully | **Boring ID:** RFI-05-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | | |
| 0 | | | | N/A | | | | | FL | | Concrete. | FILL |
| | | 1 | 0-2 | 7 6 7 | 13 | 1.2 | 4995 | | ML | | Dark yellow brown (10YR 4/6) aplastic SILT, little to some Clay, little to some fine to medium subrounded Sand, little to few fine to medium rounded to subrounded Gravel, damp, dense, no odor. Fill. | SILT |
| | 750 | 2 | 2-4 | 5 3 4 6 | 7 | 1.8 | 4185 | | CL | | Dark yellow brown (10YR 4/6) slight to moderately stiff Silty CLAY, little fine to medium subangular to subrounded Sand, trace fine to medium rounded to subrounded Gravel, damp to moist, soft to moderate stiff, no odor. Fill. | CLAY |
| 5 | | 3 | 4-6 | 3 4 4 6 | 8 | 1.8 | 1745 | | | | | |
| | 745 | 4 | 6-8 | 3 5 5 7 | 10 | 1.3 | 1912 | | SM | | Yellow brown (10YR 6/4) aplastic Silty SAND, fine subangular SAND, damp, moderately loose, no odor, more dense with depth, more moist with depth, saturated at 10.7' bgs, more silt with depth to SILT with Sand at 12' bgs and back to Silty SAND from 12.6' bgs. Fill. | SILTY SAND |
| | | 5 | 8-10 | 3 7 8 8 | 15 | 1.6 | 1945 | | | | | |
| 10 | | 6 | 10-12 | 2 4 4 6 | 8 | 1.6 | 270 | | | | | |
| | 740 | 7 | 12-14 | 4 4 3 4 | 7 | 1.7 | 58.4 | | | | | |
| 15 | | 8 | 14-16 | 2 3 5 7 | 12 | 1.8 | 61.3 | | | | SAA, but brown (10YR 5/3), alluvial or river deposits. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
+ = Positive Test Result
Samples collected 0.6-2.6' and 8.6-10.6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/26/01 | 10.7 | |

Project: 64410.022 Template: j:\rockware\logplot2001\logfiles\64410\auger_well2.ldf
Data File: j:\rockware\logplot2001\logfiles\64410\RFI-05-03.dat Date: 07/12/01

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-05-03

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | 9 | 16-18 | 2 2 3 5 | 5 | 1.6 | 31.7 | | SM | | SAA, but brown (10YR 5/3), alluvial or river deposits. | SILTY SAND | 2" ID Sch. 40 PVC 0.010"slottedscreen 8-18' bgs. |
| | | 10 | 18-20 | 2 4 7 9 | 11 | 1.6 | 266 | | | | | | #5 Global filter sandpack 6-20' bgs. |
| 20 | | | | | | | | | | | | | |
| | 730 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
+ = Positive Test Result
Samples collected 0.6-2.6' and 8.6-10.6' bgs.

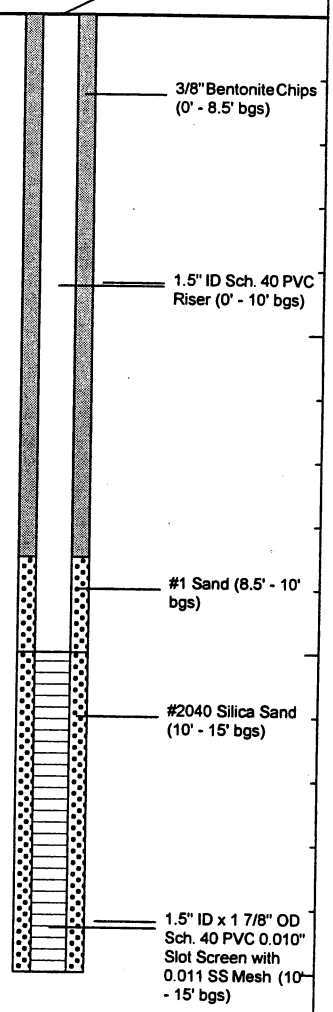
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/26/01 | 10.7 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/24/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Bit Size:**<br>**Auger Size:**<br>**Rig Type:** Geoprobe 66 DT Track Rig<br>**Sampling Method:** 2" diam. + disposable liner<br>**Hammer Weight:** | **Northing:** 566788.71<br>**Easting:** 13305470.92<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 754.32<br><br>**Geologist:** Shawn Kerr | **Well/Boring ID:** RFI-05-04<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-0.7 | - | - | NA | | | CONCRETE. |
| | | 2 | 0.7-2 | 1.6 | - | NA | | | Brown fine to medium SAND.<br>Dark brown fine to medium SAND with Clay.<br>Brown fine to medium SAND. |
| | | 3 | 2-4 | 2.0 | - | NA | | | Dark brown fine to medium SAND with Clay and Gravel.<br>Dark brown fine to medium SAND. |
| 5 | 5 | 4 | 4-6 | 1.7 | - | NA | | | Dark brown fine to medium SAND with Clay.<br>Brown fine SAND.<br>Brownish-gray CLAY, trace brown Sand. |
| | | 5 | 6-8 | 1.7 | - | NA | | | Brown fine SAND with Clay. |
| | | 6 | 8-10 | 1.6 | - | NA | | | Dark gray CLAY with brown fine Sand.<br>Brown CLAY with brown fine Sand.<br>Brown fine SAND with trace Clay and rounded Gravel. |
| 10 | 10 | 7 | 10-12 | 1.7 | - | NA | | | Dark brown CLAY with brown fine Sand.<br>Brown fine SAND, moist to wet.<br>Brown fine SAND, saturated. |
| | | 8 | 12-14 | 1.3 | - | NA | | | |
| 15 | 15 | 9 | 14-16 | 1.8 | - | NA | | | |

**Well/Boring Construction**



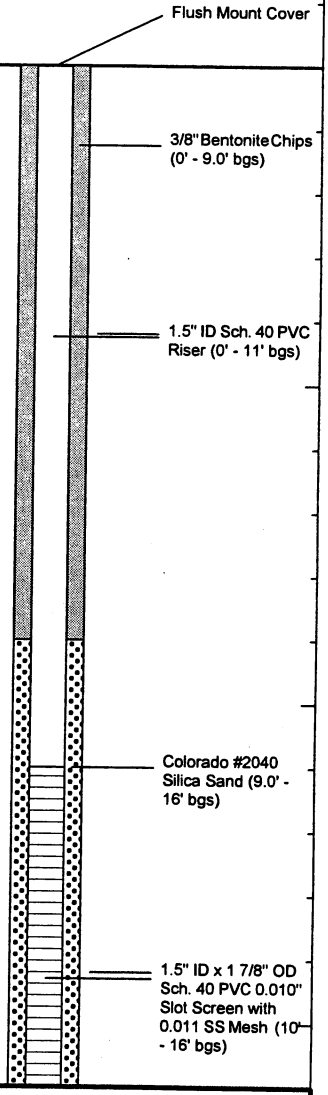

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Samples collected 0-2' and 8-10' bgs.

| | | |
|---|---|---|
| **Date Start/Finish:** 1/23/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Bit Size:**<br>**Auger Size:**<br>**Rig Type:** Geoprobe 66 DT Track Rig<br>**Sampling Method:** 2" diam. + disposable liner<br>**Hammer Weight:** | **Northing:** 566595.93<br>**Easting:** 13305461.49<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 754.34<br><br>**Geologist:** Shawn Kerr | **Well/Boring ID:** RFI-05-05<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-0.7 | - | | NA | | | CONCRETE. |
| | | 2 | 0.7-2 | 1.0 | | NA | | | Brown fine to medium SAND, rounded Gravel, Silt, and Clay. |
| | | | | | | | | | Brown fine to medium SAND with Gravel and Clay. |
| | | 3 | 2-4 | 2.0 | | NA | | | Brown fine to medium SAND. |
| 5 | 5 | 4 | 4-6 | 1.8 | | NA | | | Brown fine SAND, trace Clay. |
| | | 5 | 6-8 | 1.5 | | NA | | | Brown fine SAND. |
| | | 6 | 8-10 | 1.5 | | NA | | | |
| 10 | 10 | 7 | 10-12 | 2.0 | | NA | | | As above, moist. |
| | | 8 | 12-14 | 1.0 | | NA | | | Brown fine SAND, saturated. |
| 15 | 15 | 9 | 14-16 | 1.5 | | NA | | | |

**Well/Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Samples collected 0-2', 8-10' and 10-12' bgs.

| | | |
|---|---|---|
| **Date Start/Finish:** 7/25/01-7/26/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID SS<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 566372.86<br>**Easting:** 13305594.28<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 22' bgs<br>**Surface Elevation:** 752.13<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-05-06<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 7 7 6 5 | 13 | 1.3 | 0.0 | | ML | | Brown (10YR 4/3) SILT, little to some fine subangular to subrounded Sand, few Clay, moderately loose, no odor, dry. Roots and Vegetation present. Topsoil. | SILT |
| | 750 | 2 | 2-4 | 4 3 4 5 | 7 | 1.0 | 0.0 | | SP | | Yellow-brown (10YR 5/6) fine to medium subangular to subrounded poorly graded SAND, some to little Silt, no odor, moderately loose, aplastic, dry. Fill. | SAND |
| 5 | | 3 | 4-6 | 2 3 3 4 | 6 | 1.7 | 0.0 | | | | | |
| | 745 | 4 | 6-8 | 2 3 2 3 | 5 | 1.2 | 0.0 | | | | Gray-brown (10YR 5/2) SILT, some Clay, little fine to medium subangular to subrounded Sand, few fine to medium rounded Gravel, no odor, damp. Glacial Till. | SILT |
| | | 5 | 8-10 | 2 3 3 4 | 6 | 2.0 | 0.0 | | | | 1-1/2" wide band of black Silt possibly indicating a previous Topsoil horizon. | |
| 10 | | 6 | 10-12 | 2 4 3 4 | 7 | 1.0 | 0.0 | | ML | | Yellow-brown (10YR 5/4) SILT, some fine subangular to subrounded Sand, trace Clay, moist, moderately loose, aplastic, no odor. Wood debris at upper contact. | SILT |
| | 740 | 7 | 12-14 | 4 6 8 10 | 14 | 1.6 | 0.0 | | | | | |
| 15 | | 8 | 14-16 | 4 6 9 11 | 15 | 1.5 | 0.0 | | | | | |

**Boring Construction**

- Cement pad with 9" diam. flush-mount cover.
- Cement/Bentonite Grout (1' - 2' bgs)
- Bentonite Seal (2' - 8' bgs)
- 2" ID Sch. 40 PVC Riser (0 - 10' bgs)
- #5 Global Filter Sand Pack (8' - 22' bgs)
- 2" ID Sch. 40 PVC 0.010" Slotted Screen (10' - 20' bgs)

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
PID background : 0.0 ppm
Samples collected 0-2' and 8-10' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/25/01 | 11.8 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-05-06

**Borehole Depth:** 22' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | 9 | 16-18 | 4 7 3 10 | 16 | 1.8 | 0.0 | | ML | | Yellow-brown (10YR 5/4) SILT, some fine subangular to subrounded Sand, trace Clay, moist, moderately loose, aplastic, no odor. Wood debris at upper contact. | SILT | 2" ID Sch. 40 PVC 0.010" Slotted Screen (10' - 20' bgs) |
| | | 10 | 18-20 | 3 3 6 7 | 9 | 1.5 | 0.0 | | | | | | #5 Global Filter Sand Pack (8' - 22' bgs) |
| 20 | | 11 | 20-22 | 3 4 5 8 | 9 | 1.5 | 0.0 | | | | | | PVC Bottom Cap |
| | 730 | | | | | | | | CH | | Gray (10YR 5/1) fat CLAY, some Silt, soft, highly plastic, moist, no odor. | CLAY | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
PID background : 0.0 ppm
Samples collected 0-2' and 8-10' bgs.

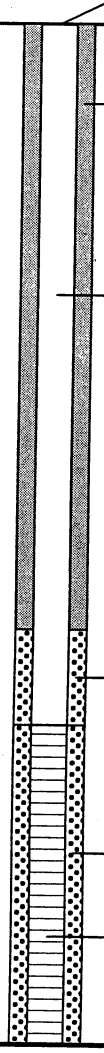
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/25/01 | 11.8 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/24/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Bit Size:**<br>**Auger Size:**<br>**Rig Type:** Geoprobe 66 DT Track Rig<br>**Sampling Method:** 2" diam. + disposable liner<br>**Hammer Weight:** | **Northing:** 566936.95<br>**Easting:** 13305313.34<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 754.38<br><br>**Geologist:** Shawn Kerr | **Well/Boring ID:** RFI-05-07<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Flint, Michigan<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-0.9 | - | NA | NA | | | CONCRETE. |
| | | 2 | 0.9-2 | 1.1 | NA | NA | ✱ | | Brown fine to medium SAND.<br>Brownish-gray CLAY. |
| | | 3 | 2-4 | 1.3 | NA | NA | | | Brown fine to medium SAND, trace Clay.<br>Black SAND with rounded and angular Rock.<br>CONCRETE Chunks.<br>Grayish-brown CLAY with brown fine Sand. |
| 5 | 5 | 4 | 4-6 | 1.7 | NA | NA | | | Crushed CONCRETE.<br>Dark gray CLAY with brown fine Sand. |
| | | 5 | 6-8 | 1.2 | NA | NA | | | Gray fine GRAVEL, trace brown fine Sand.<br>Brown fine SAND, trace Clay and small Gravel.<br>Pinkish-white Rock. |
| | | 6 | 8-10 | 1.4 | NA | NA | ✱ | | Grayish-brown CLAY with brown fine to medium Sand and small to medium Gravel.<br>Brown fine SAND.<br>As above, moist. |
| 10 | 10 | 7 | 10-12 | 1.7 | NA | NA | ✱ | | Brown medium SAND and large pink Granite Rock.<br>Brown fine to medium SAND, moist.<br>Brown fine to medium SAND, moist to wet. |
| | | 8 | 12-14 | 1.3 | NA | NA | | | Brown fine to medium SAND, saturated. |
| 15 | 15 | 9 | 14-16 | 1.4 | NA | NA | | | |

**Well/Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

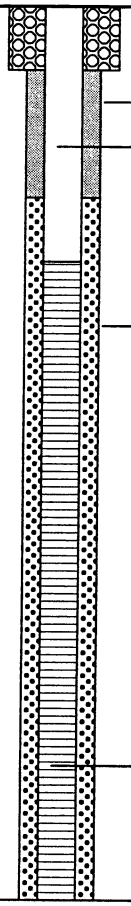
**Remarks:** bgs - below ground surface

Samples collected 0-2', 8-10' and 10-12' bgs.
NA = Not Available/Not Applicable

| | | |
|---|---|---|
| **Date Start/Finish:** 06/27/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2"x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 566961.76<br>**Easting:** 13304944.03<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** 755.77<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-05-08<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 755 | 1 | 0-2 | - 4 5 11 | 9 | 0.8 | 1177 | | SP | | Asphalt.<br>Dark yellow brown (10YR 4/6) subangular to subrounded fine SAND, trace subangular to subrounded medium to coarse Sand, Silt, damp, loose. | FILL<br>SAND |
| | | 2 | 2-4 | 10 10 12 9 | 22 | 1.6 | 809 | | SM | | Very dark gray (10YR 3/1) subangular to subrounded Silty fine SAND, few subangular to subrounded medium to coarse Sand, trace subrounded fine Gravel, coal/slag, damp/moist, moderately dense. | SILTY SAND |
| 5 | 750 | 3 | 4-6 | 3 8 8 7 | 16 | 1.7 | 4052 | | | | Yellow brown (10YR 5/6) subangular to subrounded fine SAND, trace medium to coarse subangular to subrounded Sand and fine to medium subangular to subrounded Gravel, moist, moderately dense, saturated at 5' bgs. | |
| | | 4 | 6-8 | 3 4 4 7 | 8 | 1.7 | 2214 | | CL | | Yellow brown (10 YR 5/6) CLAY (Till), trace fine to coarse subrounded Sand and fine to medium subrounded Gravel, local oxidation (increased with depth), moist, moderately stiff, silt seams up to 1" wide throughout 8'-10' bgs, from 10.7' bgs becomes gray (10YR 5/1) CLAY and no more silt seams. | CLAY |
| | | 5 | 8-10 | 2 4 7 10 | 11 | 1.9 | 8028 | | | | | |
| 10 | 745 | 6 | 10-12 | 3 5 6 8 | 11 | 1.8 | 4540 | | | | | |
| | | 7 | 12-14 | 2 1 3 4 | 4 | 1.8 | 4976 | | SP | | Yellow brown (10YR 5/6) aplastic subangular fine SAND, some Silt, trace Clay, no odor, moist, dense (alluvial or river deposits), saturated at 12' bgs. | SAND |
| 15 | 740 | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Piezometer installed, screened 4'-14' bgs.
Samples collected 0.7-2.7' and 2.7-4.7' bgs.

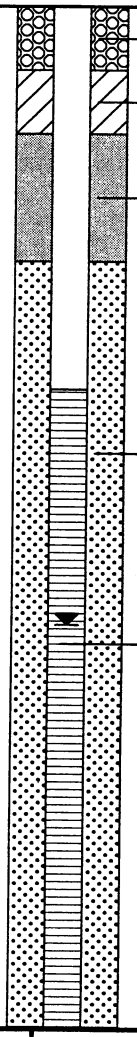
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/27/01 | 5.0' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/27/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 565732.06<br>**Easting:** 13304975.79<br>**Casing Elevation:** 751.65<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 752.03<br><br>**Descriptions By:** SM Dully | **Boring ID:** RFI-05-09<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | - | | | | | | Asphalt. | |
| | | 1 | 0-2 | 6<br>10<br>11 | 16 | 1.5 | 1756 | + | | Very dark gray brown (10YR 3/2) to black (10YR 2/1) aplastic SILT, little Clay, fine to coarse subangular to subrounded Sand, fine to medium subrounded Gravel, and asphalt fragments, no odor, damp, moderately dense to moderately loose (topsoil and asphalt debris). | |
| | 750 | | | | | | | | | | |
| | | 2 | 2-4 | 4<br>9<br>9<br>6 | 18 | 1.7 | 1056 | + | ML | Black (10YR 2/1) aplastic SILT, little fine subangular Sand, red mottling at 3.5'-4' bgs, slag from 3' to 3.5' bgs, no odor, dry, dense, became moist at 5.5' bgs. Fill. | SILT |
| | | 3 | 4-6 | 3<br>9<br>6<br>4 | 15 | 0.9 | 1452 | + | | | |
| 5 | | | | | | | | | | | |
| | | | | | | | | | | Concrete RUBBLES. | |
| | 745 | 4 | 6-8 | 2<br>2<br>13<br>9 | 15 | 1.1 | 572 | + | CL | Gray brown (10YR 5/2) soft CLAY, some Silt, little fine to medium subrounded to subangular Sand, trace to few fine to medium subangular to subrounded Gravel, no odor, damp, soft to moderate stiff (extremely oxidized glacial till). | CLAY |
| | | 5 | 8-10 | 5<br>5<br>7<br>9 | 12 | 1.6 | 1363 | + | SM | Yellow brown (10YR 5/4) aplastic Silty SAND, few to trace Clay, no odor, moist, dense, concrete rubble at 8' bgs, saturated at 9.7' bgs, decreased sand to Sandy SILT, from 10.6' bgs downward increased sand to Silty SAND, from 13.5' bgs downward increased coarseness, fine to medium subangular SAND, otherwise Silty SAND as above. | SILTY SAND |
| 10 | | | | | | | | | | | |
| | | 6 | 10-12 | 2<br>3<br>4<br>4 | 7 | 1.3 | 1160 | - | | | |
| | 740 | | | | | | | | | | |
| | | 7 | 12-14 | 3<br>3<br>3<br>4 | 6 | 1.6 | 805 | - | | | |
| 15 | | 8 | 14-16 | 2<br>3<br>3<br>5 | 6 | 2.0 | 981 | - | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; +=Positive Test Result
NA = Not Applicable/Not Available
Samples collected 0.2-2.2' and 6.2-8.2' bgs.
Piezometer installed 6-16' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/27/01 | 9.7 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-05-09

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | 9 | 16-18 | 2<br>2<br>5<br>8 | 7 | 1.5 | 601 | + | | | Yellow brown (10YR 5/4) aplastic Silty SAND, few to trace Clay, no odor, moist, dense, concrete rubble at 8' bgs, saturated at 9.7' bgs, decreased sand to Sandy SILT, from 10.6' bgs downward increased sand to Silty SAND, from 13.5' bgs downward increased coarseness, fine to medium subangular SAND, otherwise Silty SAND as above. | SILTY SAND | |
| 20 | | | | | | | | | | | | | |
| | 730 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; +=Positive Test Result
NA = Not Applicable/Not Available
Samples collected 0.2-2.2' and 6.2-8.2' bgs.
Piezometer installed 6-16' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/27/01 | 9.7 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 8/2/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID HSA<br>**Rig Type:** CME 55 | **Northing:** 565732.06<br>**Easting:** 13304975.79<br>**Casing Elevation:** 751.65<br><br>**Borehole Depth:** 34' bgs<br>**Surface Elevation:** 752.03<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-05-09Geotech<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | | | Asphalt. | | |
| | | | NA | NA | NA | NA | NA | NA | ML | | Very dark gray brown (10YR 3/2) to black (10YR 2/1) SILT, little Clay, fine to coarse subangular to subrounded Sand, fine to medium subrounded Gravel, and asphalt fragments, aplastic, no odor, damp, moderately dense to moderately loose (topsoil and asphalt debris).<br>Black (10YR 2/1) aplastic SILT, little fine subangular Sand, red mottling at 3.5-4' bgs, slag from 3-3.5' bgs, no odor, dry, dense. Fill. | SILT | Borehole backfilled with Bentonite to grade. |
| 5 | 5 | 1 | 5-7 | 7<br>11<br>5<br>4 | 16 | 1.0 | NA | NA | SM | | Very dark gray-brown (10YR 3/2) Silty fine to coarse subangular to subrounded SAND, few Clay, no odor, damp, dense. Fill.<br>Light brown (10YR 6/4) Silty fine to medium subrounded to subangular SAND, few Clay, some coarse grained Gravel- to Pebble-sized angular pieces of Cement, no odor, dense, damp. Fill. | SILTY SAND | |
| | | | NA | NA | NA | NA | NA | NA | | | | | |
| 10 | 10 | 2 | 9-11 | 3<br>4<br>6<br>5 | 10 | 1.2 | NA | NA | | | Silty SAND as above from 6-9' bgs, saturated. Sandstone and other coarse grained Gravel to Pebble-sized rocks at lower contact. | SILTY SAND | |
| | | 3 | 11-13 | 3<br>5<br>7<br>7 | 12 | 1.5 | NA | NA | | | | | |
| 15 | 15 | | NA | NA | NA | NA | NA | NA | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected for Geotechnical analyses from 9-11', 11-13', 27-29' and 31-33' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/2/01 | 9.0' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-05-09Geotech

**Borehole Depth:** 34' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NA | NA | NA | NA | NA | NA | SM | | Silty SAND as above from 6-9' bgs, saturated. Sandstone and other coarse grained Gravel to Pebble-sized rocks at lower contact. | SILTY SAND | |
| 20 | 20 | 4 | 19-21 | 2 3 3 4 | 6 | 1.8 | NA | NA | | | | | Borehole backfilled with Bentonite to grade. |
| | | 5 | 21-23 | 3 4 6 6 | 10 | 1.8 | NA | NA | CL | | Gray (10YR 5/1) Silty CLAY, little fine to medium subangular to subrounded Sand, few fine to medium rounded Gravel, no odor, increasing stiffness with depth, moist to damp, increasingly dry with depth, no odor. Local lenses of Silt up to 2" wide throughout. Clay Till. | SILTY CLAY | |
| | | | NA | NA | NA | NA | NA | NA | | | | | |
| 25 | 25 | 6 | 25-27 | 4 5 9 15 | 14 | 2.0 | NA | NA | | | Gray (10YR 5/1) fine to coarse subangular Sand lense, some Silt, little Clay, aplastic, no odor, wet to moist, moderately dense. | | |
| | | 7 | 27-29 | 10 15 37 50/5" | 52 | 1.5 | NA | NA | | | at 27': Stiff, dry to damp. Very stiff to hard. | | |
| 30 | 30 | | NA | NA | NA | NA | NA | NA | | | Hard. | | |
| | | 8 | 31-33 | 16 29 33 52 | 62 | 1.8 | NA | NA | | | | | |
| | | | 33-34 | 60/4" | NA | NA | NA | NA | | | Drillers having a great deal of difficulty turning augers. | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected for Geotechnical analyses from 9-11', 11-13', 27-29' and 31-33' bgs.

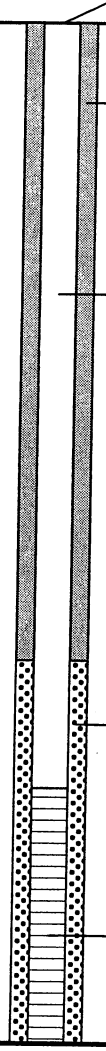
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/2/01 | 9.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/23/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Bit Size:**<br>**Auger Size:**<br>**Rig Type:** Geoprobe 66 DT Track Rig<br>**Sampling Method:** 2" diam. + disposable liner<br>**Hammer Weight:** | **Northing:** 566430.44<br>**Easting:** 13305462.50<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 754.21<br><br>**Geologist:** Shawn Kerr | **Well/Boring ID:** RFI-05-10<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-0.7 | - | NA | NA | | | CONCRETE. |
| | | 2 | 0.7-2 | 1.5 | NA | NA | ✱ | | Brown fine SAND. |
| | | 3 | 2-4 | 1.9 | NA | NA | | | Dark brown fine SAND, odor.<br>Brown fine SAND. |
| 5 | 5 | 4 | 4-6 | 2.0 | NA | NA | | | Brown CLAY with fine Sand.<br>Brown fine SAND with Clay. |
| | | 5 | 6-8 | 1.6 | NA | NA | | | Brown CLAY with fine brown Sand.<br>Brown fine SAND, trace Clay, slight odor. |
| | | 6 | 8-10 | 1.8 | NA | NA | ✱ | | Brown CLAY, trace fine Sand.<br>Brown fine SAND. |
| 10 | 10 | 7 | 10-12 | 1.7 | NA | NA | ✱ | | Brownish-gray CLAY with trace brown Sand.<br>Brown fine SAND.<br>Gray-brown fine SAND, moist. |
| | | 8 | 12-14 | 1.4 | NA | NA | | | Gray-brown fine SAND, saturated. |
| 15 | 15 | 9 | 14-16 | 1.4 | NA | NA | | | |

**Well/Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Samples collected 0-2', 8-10' and 10-12' bgs.
Duplicate sample collected from 10'-12' interval.

**Client:**
General Motors

**Site Location:**
GM-Flint - Focused RFI
Factory 36, Building 36

**Well/Boring ID:** RFI-05-10

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Colorado #2040 Silica Sand (10' - 17' bgs) |
| | | | | | NA | NA | | | | 1.5" ID x 1 7/8" OD Sch. 40 PVC 0.010" Slot Screen with 0.011 SS Mesh (12' - 17' bgs) |
| 20 | 20 | | | | | | | | | |
| 25 | 25 | | | | | | | | | |
| 30 | 30 | | | | | | | | | |
| 35 | 35 | | | | | | | | | |

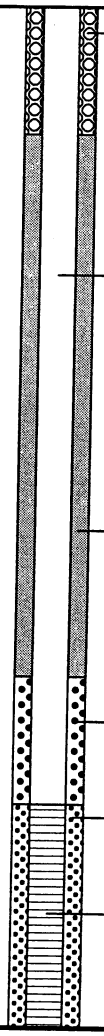
BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Samples collected 0-2', 8-10' and 10-12' bgs.
Duplicate sample collected from 10'-12' interval.

| | | |
|---|---|---|
| **Date Start/Finish:** 1/23/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Bit Size:**<br>**Auger Size:**<br>**Rig Type:** Geoprobe 66 DT Track Rig<br>**Sampling Method:** 2" diam. + disposable liner<br>**Hammer Weight:** | **Northing:** 566348.39<br>**Easting:** 13305496.80<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 17.5' bgs<br>**Surface Elevation:** 754.42<br><br>**Geologist:** Shawn Kerr | **Well/Boring ID:** RFI-05-11<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-0.7 | - | | NA | | | CONCRETE. |
| | | | | | | | | | Dark brown fine to medium SAND. |
| | | 2 | 0.7-2 | 1.3 | - | NA | ✱ | | Brown fine to medium SAND. |
| | | 3 | 2-4 | 1.2 | - | NA | | | Brown fine SAND with Clay. |
| 5 | 5 | 4 | 4-6 | 1.0 | - | NA | | | Brown fine SAND, trace Clay. |
| | | 5 | 6-8 | 0.3 | - | NA | | | Gray-brown Silty SAND with 1" angular Rock. |
| | | 6 | 8-10 | 1.6 | - | NA | ✱ | | Brown fine SAND. |
| 10 | 10 | 7 | 10-12 | 1.8 | + | NA | ✱ | | Dark gray fine SAND, moist. |
| | | | | | | | | | Brown fine SAND. |
| | | 8 | 12-14 | 1.8 | + | NA | | | Dark gray fine SAND. |
| | | | | | | | | | Brownish-gray fine SAND, moist to wet, strong odor, visible product. |
| 15 | 15 | 9 | 14-16 | 1.6 | + | NA | | | Brown fine SAND, saturated, no odor. |

**Well/Boring Construction**



- Cement pad
- 1.5" ID Sch. 40 PVC riser to 12.5' bgs.
- Hydrated bentonite chips 2-10.5' bgs.
- #1 drillers sand 10.5-12.5' bgs.
- Colorado #2040 silica sand 12.5-17.5' bgs.
- 1.5" ID Sch. 40 PVC 0.01" slotted screen 12.5-17.5' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Samples collected 0-2', 8-10' and 10-12' bgs.

+ = Positive Test Result

**Client:**
General Motors

**Site Location:**
GM-Flint - Focused RFI
Factory 36, Building 36

**Well/Boring ID:** RFI-05-11

**Borehole Depth:** 17.5' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 16-17.5 | 1.5 | - | NA | | | Brown fine SAND, saturated, slight odor. | 1.5" ID Sch. 40 PVC 0.01" slotted screen 12.5-17.5' bgs. Colorado #2040 silica sand 12.5-17.5' bgs. |
| 20 | 20 | | | | | | | | | |
| 25 | 25 | | | | | | | | | |
| 30 | 30 | | | | | | | | | |
| 35 | 35 | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

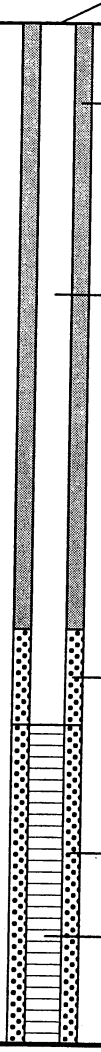
**Remarks:** Samples collected 0-2', 8-10' and 10-12' bgs.

+ = Positive Test Result

| | | |
|---|---|---|
| **Date Start/Finish:** 1/24/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Bit Size:**<br>**Auger Size:**<br>**Rig Type:** Geoprobe 66 DT Track Rig<br>**Sampling Method:** 2" diam. + disposable liner<br>**Hammer Weight:** | **Northing:** 566218.36<br>**Easting:** 13305286.77<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 754.03<br><br>**Geologist:** Shawn Kerr | **Well/Boring ID:** RFI-05-12<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-0.7 | - | - | NA | | | CONCRETE. |
| | | 2 | 0.7-2 | 1.1 | - | NA | ✱ | | Dark brown fine to medium SAND with gray Clay, moist, oily.<br>Brown fine to medium SAND. |
| | | 3 | 2-4 | 1.9 | - | NA | | | Light brown fine SAND.<br>Brown fine SAND, with Clay.<br>Brown CLAY with fine Sand, trace Gravel. |
| 5 | 5 | 4 | 4-6 | 2.0 | - | NA | | | |
| | | 5 | 6-8 | 2.0 | - | NA | | | Brown fine SAND.<br>Brown fine SAND with Clay. |
| | | 6 | 8-10 | 1.3 | - | NA | ✱ | | Brown fine SAND, moist @ 10.7' bgs. |
| 10 | 10 | 7 | 10-12 | 1.7 | - | NA | ✱ | | |
| | | 8 | 12-14 | 1.5 | - | NA | | | Brown/Gray fine SAND, saturated. |
| 15 | 15 | 9 | 14-16 | 1.5 | - | NA | | | Dark gray fine SAND.<br>Brown fine SAND, saturated. |

**Well/Boring Construction**



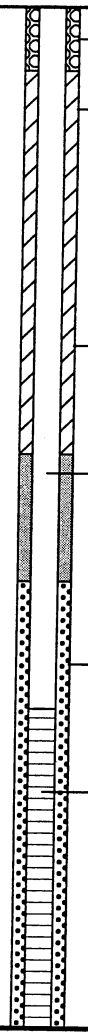

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Samples collected 0-2', 8-10' and 10-12' bgs.

| | | |
|---|---|---|
| **Date Start/Finish:** 1/22/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Bit Size:**<br>**Auger Size:**<br>**Rig Type:** Geoprobe 66 DT Track Rig<br>**Sampling Method:** 2" diam. + disposable liner<br>**Hammer Weight:** | **Northing:** 566012.39<br>**Easting:** 13305522.59<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 754.16<br><br>**Geologist:** Shawn Kerr | **Well/Boring ID:** RFI-05-13<br><br>**Client:** General Motors<br><br>**Location:** GM-Flint - Focused RFI |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-0.8 | - | - | NA | | | CONCRETE. |
| | | 2 | 0.8-2 | 1.2 | - | NA | ✱ | | Brown fine to medium SAND. |
| | | | | | | | | | Brown Sandy CLAY, stiff. |
| | | 3 | 2-4 | 1.8 | - | NA | | | Brown fine to medium SAND. |
| | | | | | | | | | Brown fine to medium SAND, some rounded grade Backfill, trace Clay. |
| 5 | 5 | 4 | 4-6 | 1.5 | - | NA | | | Brown fine to medium SAND. |
| | | 5 | 6-8 | 0.3 | - | NA | | | Gray angular GRAVEL with brown Sand. |
| | | | | | | | | | CONCRETE. |
| | | 6 | 8-10 | 1.3 | - | NA | ✱ | | Gray angular GRAVEL with brown Sand. |
| | | | | | | | | | Brown fine SAND. |
| 10 | 10 | 7 | 10-12 | 1.7 | - | NA | ✱ | | As above, wet. |
| | | | | | | | | | As above, saturated. |
| | | 8 | 12-14 | 1.3 | + | NA | | | As above, saturated, odor. |
| | | | | | | | | | Brown fine SAND, saturated. |
| 15 | 15 | 9 | 14-16 | 1.8 | - | NA | | | Brown fine to medium SAND, saturated. |

**Well/Boring Construction**



- Cement pad with 9" diam. flush-mount cover.
- Grout 1-7' bgs
- Bentonite seal 7-9' bgs.
- 1" ID Sch. 40 PVC riser 0.2-11' bgs.
- Global #5 sandpack 9-16' bgs.
- 1" ID Sch. 40 PVC 0.010"slottedscreen 11-16' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

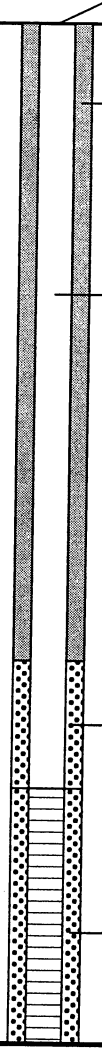
**Remarks:** Soil samples collected 0-2' 8-10' and 10-12' bgs.

+ = Positive Test Result
Installed permanent 1.5" diam., 5-ft well 11-16' bgs.

| | | |
|---|---|---|
| **Date Start/Finish:** 1/22/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift, Dennis Powney<br>**Drilling Method:** Direct Push<br>**Bit Size:**<br>**Auger Size:**<br>**Rig Type:** Geoprobe 66 DT Track Rig<br>**Sampling Method:** 2" diam. + disposable liner<br>**Hammer Weight:** | **Northing:** 565710.21<br>**Easting:** 13305445.39<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 754.12<br><br>**Geologist:** Ron Kuhn | **Well/Boring ID:** RFI-05-14<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-0.5 | - | | NA | | | CONCRETE. |
| | | 2 | 0.5-2 | 2.0 | - | NA | X | | Brown fine to medium SAND. |
| | | 3 | 2-4 | 1.5 | - | NA | | | Dark brown-black SAND.<br>Brown fine to medium SAND. |
| 5 | 5 | 4 | 4-6 | 1.8 | - | NA | | | Black medium SAND.<br>Brown fine to medium SAND, trace Clay. |
| | | 5 | 6-8 | 1.9 | - | NA | | | Brown fine to medium SAND.<br>Dark brown SAND.<br>Gray angular GRAVEL with Sand. |
| | | 6 | 8-10 | 2.0 | - | NA | X | | Brown fine SAND. |
| 10 | 10 | 7 | 10-12 | 1.2 | - | NA | X | | Brown fine SAND, moist to wet.<br>Very fine SAND, wet, odor. |
| | | 8 | 12-14 | 1.0 | + | NA | | | As above, saturated. |
| 15 | 15 | 9 | 14-16 | 1.9 | + | NA | | | |

**Well/Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Samples collected 0-2', 8-10' and 10-12' bgs.
+ = Positive Test Result

**Client:**
General Motors

**Site Location:**
GM-Flint - Focused RFI
Factory 36, Building 36

**Well/Boring ID:** RFI-05-14

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Colorado #2040 Silica Sand (10' - 17' bgs) |
| | | | | | | | | | | 1.5" ID Sch. 40 PVC 0.010" Slot Screen (12' - 17' bgs) |
| 20 | 20 | | | | | | | | | |
| 25 | 25 | | | | | | | | | |
| 30 | 30 | | | | | | | | | |
| 35 | 35 | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Samples collected 0-2', 8-10' and 10-12' bgs.
+ = Positive Test Result

| | | |
|---|---|---|
| **Date Start/Finish:** 9/8/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2" ID Acetate Sleeve<br>**Auger Size:** NA<br>**Rig Type:** Mule-Mounted Geoprobe | **Northing:** 566437.69<br>**Easting:** 13305430.92<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** 754.51<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-05-15<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | |
| 0 | | | | | | | FL | | CONCRETE. | FILL | |
| | | 1 | 0-4 | 3.0 | 0.0<br>0.0 | -<br>- | SM | | Light yellow-brown 10YR 6/4 to yellow-brown 10YR 5/4 Silty SAND (SM), fine grained subangular Sand, trace Clay, aplastic, no odor, moderately dense to dense, dry, Fill. | SILTY SAND | |
| 5 | 750 | 2 | 4-8 | 4.0 | 0.0<br>0.0 | +<br>+ | CL | | Brown 10YR 5/3 Silty lean CLAY (CL), little fine to coarse subangular Sand, trace fine to medium subangular Sand, trace fine to medium subangular Gravel, moderately stiff, no odor, dry, heavily oxidized. Native Clay Till used as backfill.<br>Occasional Silt lenses up to 3" thick throughout. | SILTY CLAY | Borehole backfilled with Bentonite to grade. |
| 10 | 745 | 3 | 8-12 | 4.0 | 0.0<br>0.0 | +<br>+ | SM | | Silty SAND (SM) as at 0.9' - 5.6' bgs, but damp.<br>Saturated with oil, oily sheen, moderate odor. | SILTY SAND | |
| 15 | 740 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; +=Positive Test Result
NA = Not Applicable/Not Available
Saturated with oil at 9.7' bgs.
Samples collected 0.9-2.9' and 6.9-8.9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 9/8/01 | 9.7' | |

Project: 64410.022 Template: j:\rockware\logplot2001\logfiles\64410\geoprobe.ldf
Data File:RFI-05-15.dat
Date: 11/19/01

| | | |
|---|---|---|
| **Date Start/Finish:** 9/8/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2" ID Acetate Sleeve<br>**Auger Size:** NA<br>**Rig Type:** Mule-Mounted Geoprobe | **Northing:** 566056.82<br>**Easting:** 13305416.35<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 754.45<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-05-16<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | |
| 0 | | | | | | | | | CONCRETE. | FILL | |
| | | | | | 0.0 | - | SM | | Light yellow-brown (10YR 6/4) Silty SAND, fine subangular Sand, trace Clay, no odor, moderately dense to dense, dry. Fill. | | |
| | | 1 | 0-4 | 3.0 | | | | | | | |
| | | | | | 0.0 | + | ML | | Yellow-brown (10YR 5/4) SILT, little fine subangular Sand and Clay, no odor, dense, dry. Fill. | SILT | |
| | | | | | | | | | Black (10YR 2/1) SILT, few Clay, no odor, damp, aplastic, moderately dense. Fill. | | |
| | 750 | | | | | | | | | | |
| 5 | | | | | 0.0 | - | | | Yellow-brown (10YR 5/4) Silty SAND, as above from 2.1-3.6' bgs, aplastic. | SILTY SAND | Borehole backfilled with Bentonite to grade. |
| | | 2 | 4-8 | 3.0 | | | SM | | | | |
| | | | | | 0.0 | - | | | | | |
| | | | | | 0.0 | - | | | | | |
| | 745 | | | | | | | | | | |
| 10 | | 3 | 8-12 | 4.0 | | | CL | | Gray-brown (10YR 5/2) Silty lean CLAY, little fine to medium subangular Sand, trace fine to medium subrounded Gravel, heavily mottled and oxidized, no odor, moderately stiff, damp. Clay Till. | SILTY CLAY | |
| | | | | | 0.0 | - | | | | | |
| | | | | | 0.0 | - | | | Gray (10YR 5/1) to yellow-brown (10YR 5/4) Silty SAND, little fine to medium subangular Sand, few Clay, no odor, varved, aplastic, moderately dense to moderately loose, damp becoming increasingly moist with depth.<br><br>Saturated. | SILTY SAND | |
| | | 4 | 12-16 | 3.1 | | | SM | | | | |
| | 740 | | | | | | | | | | |
| 15 | | | | | 0.0 | - | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
+ = Positive Test Result
Samples collected 0.8-2.8', 8.8-10.8' and 10.8-12.8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 9/8/01 | 12.8' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 9/8/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2" ID Acetate Sleeve<br>**Auger Size:** NA<br>**Rig Type:** Mule-Mounted Geoprobe | **Northing:** 565981.14<br>**Easting:** 13305413.33<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 754.34<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-05-17<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | |
| 0 | | | | | | | FL | | CONCRETE. | FILL | |
| | | | | | | - | SM | | Yellow-brown (10YR 5/4) Silty lean CLAY, little fine to medium subangular to subrounded Sand, trace fine to coarse grained rounded Gravel, weakly plastic, moderately stiff, no odor, dry. Clay Till. | | |
| | | 1 | 0-4 | 3.0 | NA | + | ML | | Yellow-brown (10YR 5/4) SILT, little to few fine subangular Sand, few Clay, no odor, moderately dense to dense, dry, aplastic.<br><br>Becomes black (10YR 2/1). | SILT | |
| | 750 | | | | | | | | | | |
| 5 | | | | | | + | | | Becomes Oily, increased Clay content to little to some. | | |
| | | 2 | 4-8 | 4.0 | NA | | CL | | 4" of Terracotta debris mixed with gray (10YR 5/1) Silty lean CLAY as at 0.9' - 2.2' bgs. | | Borehole backfilled with Bentonite to grade. |
| | | | | | | - | SW | | Yellow (10YR 7/6) fine to coarse subangular well graded SAND, some Silt, semi-lithified, aplastic, no odor, dense, dry. | SAND | |
| | | | | | | | CL | | Yellow-brown (10YR 5/4) Silty CLAY, as above from 0.9-2.2' bgs, damp. Fill. | SILTY CLAY | |
| | 745 | | | | | - | | | | | |
| 10 | | 3 | 8-12 | 3.0 | NA | - | SM | | Yellow-brown (10YR 5/6) Silty SAND, fine to medium subangular Sand, few Clay, no odor, damp to moist, dense, aplastic. Fill. | SILTY SAND | |
| | | 4 | 12-16 | 3.0 | NA | - | | | Saturated. | | |
| | 740 | | | | | | | | | | |
| 15 | | | | | | - | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Background PID = 0.0 ppm
Samples collected 0.9-2.9', 8.9-10.9' and 10.9-12.9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 9/8/01 | 13.5' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 8/8/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2" ID Acetate Sleeve<br>**Auger Size:** NA<br>**Rig Type:** Mule-Mounted Geoprobe | **Northing:** 565720.11<br>**Easting:** 13305335.02<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** 754.38<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-05-18<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | |
| 0 | | | | | | | FL | | CONCRETE. | FILL | |
| | | 1 | 0-4 | 3.0 | 0.0 | + | SM | | Pale brown (10YR 6/3) Silty SAND, fine subangular Sand, few Clay, aplastic, no odor, dense, dry. Varved with lenses up to 2" thick throughout of fine to medium angular yellow-brown (10YR 5/4) Sand (SP), no odor, dense, dry. Fill | SILTY SAND | |
| | | | | | 0.0 | + | ML | | Brown 10YR 4/3 SILT, little Clay, no odor, aplastic, dense. | SILT | |
| | 750 | | | | | | SP | | Pale brown (10YR 6/3) SAND as above from 0.9-3.2' bgs, aplastic. | SAND | |
| 5 | | 2 | 4-8 | 4.0 | 0.0 | + | ML | | Black (10YR 2/1) SILT, few Clay, aplastic, no odor, dense, dry, Fill. | SILT | Borehole backfilled with Bentonite to grade. |
| | | | | | | | SM | | Gray-brown (10YR 5/2) Silty SAND, little Clay, no odor, dry, very dense, aplastic. | | |
| | | | | | 0.0 | + | CL | | Very dark gray (10YR 3/1) Silty CLAY, little fine to medium subangular Sand, very stiff, moderate odor, oily sheen, weakly plastic. | SILTY CLAY | |
| | 745 | | | | 0.0 | + | SM | | Very dark gray (10YR 3/1) Silty SAND, as above from 6.4-6.8' bgs but mixed with very fine to coarse sand-sized angular Slag. Fill | SILTY SAND | |
| 10 | | 3 | 8-12 | 4.0 | 0.0 | + | | | Yellow-brown (10YR 5/2) Silty SAND, as above from 6.4-6.8' bgs but moist to increasingly moist, aplastic. | | |
| | | 4 | 12-14 | 2.0 | 0.0 | + | | | Very dark gray-brown (10YR 5/2) Silty SAND, aplastic, oily, moderate odor.<br>Varved throughout with alternating yellow-brown (10YR 5/4) and black (10YR 2/1) Silt lenses, moist.<br>Yellow-brown (10YR 5/4) Silty SAND as above at 12-13.5' bgs, saturated. | | |
| | 740 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; +=Positive Test Result;
NA = Not Applicable/Not Available
Background PID = 0.0 ppm
Samples collected 0.9-2.9', 6.9-8.9' and 8.9-10.9' bgs.

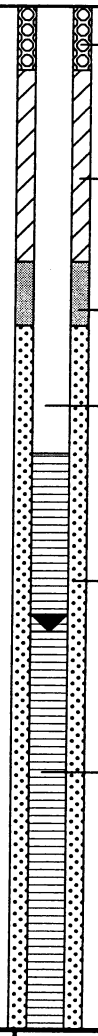
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/8/01 | 12' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/26/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 565337.75<br>**Easting:** 13305443.96<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 749.48<br><br>**Descriptions By:** SC Kerr | **Boring ID:** RFI-05-19S<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 750 | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 6 5 4 3 | 9 | 1.2 | >9999 | - | FL | | Concrete. | FILL |
| | | | | | | | | | SP | | Yellow brown (10YR 5/6) fine to coarse SAND, little Clay, moist, loose, no odor. | SAND |
| | | 2 | 2-4 | 3 4 5 5 | 9 | 1.8 | 355 | - | CL | | Yellow brown (10YR 5/4) Silty CLAY, stiff, (pp>4.5), dry, low plastic, trace fine to coarse subangular Sand, no odor. | CLAY |
| | 745 | 3 | 4-6 | 3 3 4 4 | 7 | 1.8 | 373 | - | ML | | Yellow brown (10YR 5/6) SILT, little fine Sand, damp, moderately dense, no odor. | SILT |
| 5 | | 4 | 6-8 | 3 3 4 7 | 7 | 1.3 | 163 | - | SP | | Yellow brown (10YR 5/6) fine to medium SAND, little Silt above 7' bgs, no silt from 7' bgs, moist, loose, no odor, wet at 8.2' bgs, saturated at 9.8' bgs. | SAND |
| | | 5 | 8-10 | 3 4 6 4 | 10 | 1.6 | 96.9 | - | | | | |
| | 740 | | | | | | | | | | | |
| 10 | | 6 | 10-12 | 3 3 4 6 | 7 | 1.6 | 0 | - | | | | |
| | | 7 | 12-14 | 2 5 7 14 | 12 | 1.7 | 0 | - | | | | |
| | 735 | | | | | | | | | | | |
| 15 | | 8 | 14-16 | NA | NA | 1.8 | 0 | - | SM | | Yellow brown (10YR 5/6) Sandy SILT and fine to medium SAND, moist, moderately dense, no odor. | |

**Boring Construction**



- Cement pad with 9" diam. flush-mount cover.
- Cement/bentonite grout 1-4' bgs.
- Bentonite chip seal 4-5' bgs.
- 2" ID PVC riser to 7' bgs.
- #5 Global filter pack sandpack 5-17' bgs.
- 2" ID PVC 0.010" slotted screen 7.0-17.0' bgs

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
PID background : 0.0 ppm
Samples collected 0.8-2.8' and 6.8-8.8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/26/01 | 9.8 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-05-19S

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | SM | | Yellow brown (10YR 5/6) Sandy SILT and fine to medium SAND, moist, moderately dense, no odor. | | 2" ID PVC 0.010" slotted screen 7.0-17.0' bgs; #5 Global filter pack sandpack 5-17' bgs. |
| 20 | 730 | | | | | | | | | | | | |
| 25 | 725 | | | | | | | | | | | | |
| 30 | 720 | | | | | | | | | | | | |
| 35 | 715 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
PID background : 0.0 ppm
Samples collected 0.8-2.8' and 6.8-8.8' bgs.

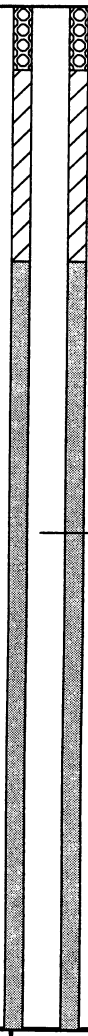
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/26/01 | 9.8 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/23/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4"<br>**Rig Type:** CME 55 | **Northing:** 565337.57<br>**Easting:** 13305442.85<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 29' bgs<br>**Surface Elevation:** 749.31<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-05-19D<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 750 | | | | | | | | | | | |
| 0 | | | | | | | | | FILL | | Concrete. | FILL |
| | | | | | | | | | SP | | Yellow brown (10YR 5/6) fine to coarse SAND, little Clay, moist, loose, no odor. | SAND |
| | | | | | | | | | CL | | Yellow brown (10YR 5/4) Silty CLAY, stiff, (pp>4.5), dry, low plastic, trace fine to coarse subangular Sand, no odor. | CLAY |
| | 745 | | | | | | | | | | | |
| 5 | | | | | | | | | ML | | Yellow brown (10YR 5/6) SILT, little fine Sand, damp, moderately dense, no odor. | SILT |
| | | | | | | | | | SP | | Yellow brown (10YR 5/6) fine to medium SAND, little Silt above 7' bgs, no silt from 7' bgs, moist, loose, no odor, wet at 8.2' bgs, saturated at 9.8' bgs. | SAND |
| | 740 | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| | 735 | | | | | | | | SM | | Yellow brown (10YR 5/6) Sandy SILT and fine to medium SAND, moist, moderately dense, no odor. | |
| 15 | | 1 | 15-17 | 2<br>2 | 5 | 1.3 | 0.0 | - | SP | | Yellow-brown (10YR 5/4) fine to medium subangular to subrounded SAND, some Silt, loose, no odor, saturated. | SAND |

**Boring Construction**



- Cement pad with 9" diam. flush-mount cover.
- Cement/bentonite grout 1-4' bgs.
- Bentonite seal 4-24.5' bgs.
- 2" ID PVC riser 0.2-26.5' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; pp=pocket penetrometer
NA = Not Applicable/Not Available
PID background : 0.0 ppm; Drilled down to 15' bgs.
Geologic descriptions for 0-15' bgs from RFI-05-19S.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/23/01 | 27.0' | |

**Client:**
General Motors

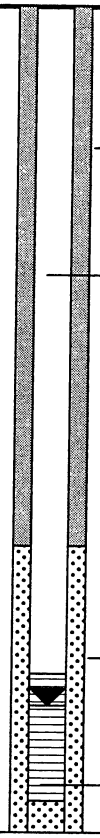
**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-05-19D

**Borehole Depth:** 29' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 15-17 | 3 2 | 5 | 1.3 | 0.0 | - | SP | | Yellow-brown (10YR 5/4) fine to medium subangular to subrounded SAND, some Silt, loose, no odor, saturated. Heavily oxidized @ 16.8' bgs. | SAND |
| | | 2 | 17-19 | 1 2 3 4 | 5 | 1.3 | 0.0 | - | | | Gray (10YR 5/1) Silty CLAY, few to little subrounded Sand, trace fine rounded Gravel, moderately stiff, no odor, damp. Clay Till. | SILTY CLAY |
| 20 | 730 | 3 | 19-21 | 2 2 4 6 | 6 | 1.2 | 0.0 | - | | | | |
| | | 4 | 21-23 | 4 7 13 15 | 20 | 1.6 | 0.0 | - | CL | | Increased sand to little, fine to medium subrounded; increased gravel to few fine to coarse rounded; increased stiffness to stiff to very stiff. | |
| | | 5 | 23-25 | 7 14 19 27 | 33 | 1.7 | 0.0 | - | | | hard | |
| 25 | 725 | 6 | 25-27 | 3 10 11 12 | 21 | 1.8 | 0.0 | - | | | | |
| | | 7 | 27-29 | 27 32 50/ 4" | NA | NA | 0.0 | - | SP | | Fine to medium rounded to subrounded SAND with fine to coarse rounded Gravel and Pebbles, little Silt, little Clay, loose, no odor, saturated. Glacial-alluvial (possible outwash). | SAND |
| | | | | | | | | | CL | | Silty CLAY as above at 17-27' bgs, very hard, dry, friable. Clay Till. | |
| 30 | 720 | | | | | | | | | | | |
| 35 | 715 | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; pp=pocket penetrometer
NA = Not Applicable/Not Available
PID background : 0.0 ppm; Drilled down to 15' bgs.
Geologic descriptions for 0-15' bgs from RFI-05-19S.

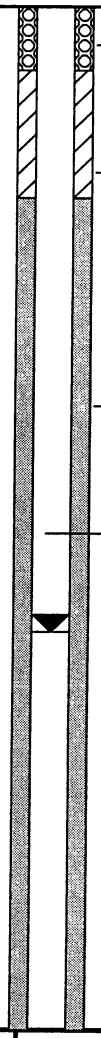
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/23/01 | 27.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/07/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID HSA<br>**Rig Type:** CME 55 | **Northing:** 565330.81<br>**Easting:** 13305450.8<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 29' bgs<br>**Surface Elevation:** 749.48<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-05-19DR<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 750 | | | | | | | | | | | |
| 0 | | | | | | | | | FILL | | Concrete. | FILL |
| | | | | | | | | | SW | | Yellow brown (10YR 5/6) fine to coarse SAND, little Clay, moist, loose, no odor. | SAND |
| | | | | | | | | | CL | | Yellow brown (10YR 5/4) Silty CLAY, stiff, (pp>4.5), dry, low plastic, trace fine to coarse subangular Sand, no odor. | CLAY |
| | 745 | | | | | | | | ML | | Yellow brown (10YR 5/6) SILT, little fine Sand, damp, moderately dense, no odor. | SILT |
| 5 | | 1 | HSA | NA | NA | NA | NA | NA | SP | | Yellow brown (10YR 5/6) fine to medium SAND, little Silt above 7' bgs, no silt from 7' bgs, moist, loose, no odor, wet at 8.2' bgs, saturated at 9.8' bgs. | SAND |
| | 740 | | | | | | | | | | | |
| 10 | | | | | | | | | SP | | Saturated. | |
| | 735 | | | | | | | | SM | | Yellow brown (10YR 5/6) Sandy SILT and fine to medium SAND, moist, moderately dense, no odor. | SAND |
| 15 | | | | | | | | | SP | | Yellow-brown (10YR 5/4) fine to medium subangular to subrounded SAND, some Silt, loose, no odor, saturated. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Stratigraphy to 25' bgs is from RFI-05-19D (7/23/01)

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/7/01 | 9.8' bgs | |

**Client:**
General Motors

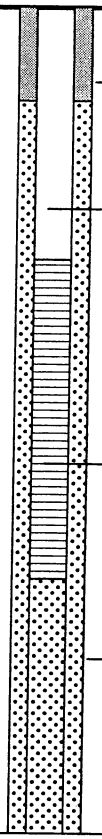
**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-05-19DR

**Borehole Depth:** 29' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | SP | Yellow-brown (10YR 5/4) fine to medium subangular to subrounded SAND, some Silt, loose, no odor, saturated. Heavily oxidized @ 16.8' bgs. | SAND |
| | | | | | | | | | CL | Gray (10YR 5/1) Silty CLAY, few to little subrounded Sand, trace fine rounded Gravel, moderately stiff, no odor, damp. Clay Till. | SILTY CLAY |
| 20 | 730 | 1 | HSA | NA | NA | NA | NA | NA | CL | Increased sand to little, fine to medium subrounded; increased gravel to few fine to coarse rounded; increased stiffness to stiff to very stiff. | SILTY CLAY |
| | | | | | | | | | CL | Hard. | SILTY CLAY |
| 25 | 725 | | | | | | | | CL | (10YR 5/1) Silty lean CLAY, little fine to coarse subangular to subrounded Sand, very stiff to hard, weakly plastic, no odor, dry. Clay Till. | SILTY CLAY |
| | | 2 | 27-29 | 31 50/ 5" | NA | 1.0 | 0.0 | - | CL | Fine to medium rounded to subrounded SAND with fine to coarse rounded Gravel and Pebbles, little Silt, little Clay, loose, no odor, saturated. Glacial-alluvial (possible outwash). | SAND |
| | | | | | | | | | | Silty CLAY as above at 17-27' bgs, very hard, dry, friable. Clay Till. | |
| 30 | 720 | | | | | | | | | | |
| 35 | 715 | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Stratigraphy to 25' bgs is from RFI-05-19D (7/23/01)

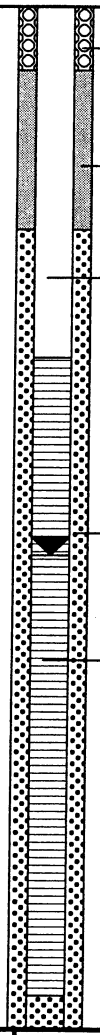
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/7/01 | 9.8' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/22/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID split spoon<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 565364.93<br>**Easting:** 13305321.57<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 750.41<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-05-20<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | | | n/a | | | | | FL | | Concrete. | FILL |
| | | 1 | 0-2 | 3 2 3 | 5 | 0.8 | 3.1 | - | ML-CL | | Gray brown (10 YR 5/2) SILTY CLAY. Little fine Sand. Moist, no odor, moderate plasticity. | SILTY CLAY |
| | | 2 | 2-4 | 4 5 5 3 | 10 | n/a | 0.0 | - | | | Yellow brown (10 YR 5/6) fine to medium SAND. Loose, wet. | |
| | | | | | | | | | ML | | Gray brown (10 YR 5/2) SILTY CLAY. Little fine Sand. Moist, no odor, moderate plasticity. | SILT |
| 5 | 745 | 3 | 4-6 | 4 5 5 7 | 10 | 1.7 | 0.0 | - | | | Dark yellow brown SILT(10 YR 4N). Some Clay. Little Sand. Dense, damp, no odor. Local oxidation. No recovery at 3.5' bgs. From 5.3'-5.8' bgs, decrease in Sand finesse ( fine to coarse). | |
| | | 4 | 6-8 | 4 5 5 4 | 10 | 1.5 | 0.0 | - | | | | |
| | | 5 | 8-10 | 4 5 4 4 | 9 | 1.5 | 0.0 | - | SP | | Yellow brown (10 YR 5/6) fine to coarse SAND. Some Silt. Saturated. Local oxidation at 14.0' bgs. | SAND |
| 10 | 740 | 6 | 10-12 | 2 4 5 5 | 9 | 1.5 | 0.0 | - | | | | |
| | | 7 | 12-14 | 2 3 7 9 | 10 | 1.5 | 0.0 | - | | | | |
| 15 | 735 | 8 | 14-16 | 2 4 5 7 | 9 | | 1.5 | - | | | | |
| | | | | | | | | | CL | | Gray (10 YR 6/1) highly plastic CLAY. Soft, no odor. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
PID background : 0.0 ppm
Samples collected 0.7-2.7' and 6.7-8.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/22/01 | 8.6' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-05-20

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | CL | | Gray (10 YR 6/1) highly plastic CLAY. Soft, no odor. | CLAY | #5 Global filter sandpack 3.5-17' bgs. |
| 20 | 730 | | | | | | | | | | | | |
| 25 | 725 | | | | | | | | | | | | |
| 30 | 720 | | | | | | | | | | | | |
| 35 | 715 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
PID background : 0.0 ppm
Samples collected 0.7-2.7' and 6.7-8.7' bgs.

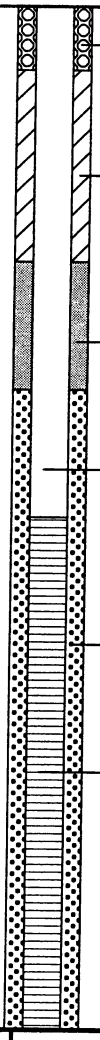
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/22/01 | 8.6' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/26/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 565554.79<br>**Easting:** 13305577.26<br>**Casing Elevation:** 748.73<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 749.06<br><br>**Descriptions By:** SC Kerr | **Boring ID:** RFI-05-21<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 750 | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 3 3 2 6 | 5 | 1.5 | >9999 | - | SP | | Yellow brown (10YR 5/6) fine to medium SAND, some Silt, little Clay, dry to damp, loose, no odor. | SAND |
| | | | | | | | | | ML | | Very dark grayish brown (10YR 3/2) SILT, some Clay, little fine to medium Sand, trace subangular Gravel, moist. | SILT and CLAY |
| | | 2 | 2-4 | 5 7 9 11 | 16 | 1.3 | 1460 | - | CL | | Very dark grayish brown (10YR 3/2) CLAY, some Silt, little fine to coarse Sand, dry, local oxidation, pp=3.0, from 2.5' bgs increased silt to Silty CLAY. | |
| | 745 | | | | | | | | ML | | Dark grayish brown (10YR 4/2) SILT, some Clay, some fine to coarse Sand, few medium to coarse Gravel and concrete rubbles, dry to moist, loose, no odor. | |
| 5 | | 3 | 4-6 | 1 3 2 1 | 5 | 1.1 | 1220 | - | SP | | Yellow brown (10YR 5/4) fine to medium SAND, wet, loose, no odor. | SAND |
| | | 4 | 6-8 | 1 1 2 1 | 3 | 1.5 | 640 | - | ML | | Black (10YR 2/1) SILT, some Clay, little fine Sand, trace coarse subangular Gravel, wet, moderately dense, no odor. | SILT |
| | 740 | 5 | 8-10 | 1 4 7 10 | 11 | 1.7 | 91 | - | | | Light olive brown (2SY 5/3) SILT, some Clay, some fine toi medium Sand, wet, dense, no odor. | |
| 10 | | 6 | 10-12 | 4 4 3 5 | 7 | 1.4 | 0 | - | SP | | Grayish brown (2SY 5/2) fine to medium SAND, saturated, moderately dense, no odor, color turns to brown (10YR 5/3) at 13.2' bgs. | SAND |
| | | 7 | 12-14 | 4 6 7 11 | 13 | 2.0 | 2.1 | - | | | | |
| | 735 | | | | | | | | | | | |
| 15 | | 8 | 14-16 | 4 3 6 6 | 9 | 1.8 | 0 | - | | | | |

**Boring Construction**



- Cement pad with 9" diam. flush-mount cover.
- Cement/bentonite grout 1-4' bgs.
- Bentonite chip seal 4-6' bgs.
- 2" ID PVC riser to 8' bgs.
- #5 Global filter pack sandpack 6-18' bgs.
- 2" ID PVC 0.010" slotted screen 8.0'-18.0' bgs

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
pp=pocket penetrometer.
Samples collected 0-2' and 6-8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/26/01 | 9.3 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-05-21

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 4<br>4<br>6<br>4 | 10 | 2.0 | NA | - | SP | | Grayish brown (2SY 5/2) fine to medium SAND, saturated, moderately dense, no odor, color turns to brown (10YR 5/3) at 13.2' bgs. | ← SAND → | 2" ID PVC 0.010" slotted screen 8.0'-18.0' bgs<br>#5 Global filter pack sandpack 6-18' bgs. |
| | | | | | | | | | CL | | Gray (10YR 5/1) CLAY, some Silt, trace fine Sand, soft, no odor. | | |
| 20 | 730 | | | | | | | | | | | | |
| 25 | 725 | | | | | | | | | | | | |
| 30 | 720 | | | | | | | | | | | | |
| 35 | 715 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
pp=pocket penetrometer.
Samples collected 0-2' and 6-8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/26/01 | 9.3 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/26/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 565581.01<br>**Easting:** 13305577.68<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 6' bgs<br>**Surface Elevation:** 748.87<br><br>**Descriptions By:** S.M. Duly | **Boring ID:** RFI-05-22<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 750 | | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 4<br>6<br>4<br>5 | 10 | 1.5 | 0.0 | - | FL | | Large GRAVEL to cobble-sized angular large AGGREGATE. Fill. | | |
| | | | | | | | | | SW | | Yellow-brown (10YR 5/4) fine to medium subangular well graded SAND, some Silt, no odor, moderately dense, aplastic, damp. Fill. | | |
| | | | | | | | | | ML | | Brown (10YR 5/3) SILT, little fine to medium subrounded to subangular Sand, little Clay, no odor, moderately dense, aplastic, damp. | SILT | |
| | | 2 | 2-4 | 4<br>7<br>50/<br>3" | 57 | 0.5 | 0.0 | - | FL | | CONCRETE. | FILL | Borehole backfilled with bentonite to grade. |
| | 745 | | | | | | | | | | | | |
| 5 | | 3 | 4-6 | 4<br>4<br>4<br>3 | 8 | 1.0 | 0.0 | + | ML | | Brown (10YR 5/3) SILT, little fine to medium subrounded to subangular Sand, little Clay, weak to moderate odor, oily sheen, moderately dense, aplastic, moist, presence of ash and wood debris. | SILT | |
| | 740 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |
| | 735 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
PID background : 0.0 ppm
Samples collected 0.5-2.5' and 4-6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/26/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 565554.46<br>**Easting:** 13305600.73<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 6' bgs<br>**Surface Elevation:** 747.97<br><br>**Descriptions By:** S.M. Duly | **Boring ID:** RFI-05-23<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 750 | | | | | | | | | | | | |
| 0 | | | | 44<br>47<br>45<br>14 | | | | | FL | | Asphalt and Concrete (at 4", asphalt on top of concrete). | FILL | |
| | 745 | 1 | 0-4 | | 92 | 1.7 | 0.0 | - | SW | | Brown (10YR 5/3) to black (10YR 2/1) well graded subangular SAND mixed with Slag, Glass, and Ash, no odor, very dense, aplastic, dry. SLAG & FILL. | SAND | Borehole backfilled with bentonite to grade. |
| | | | | | | | | | FL | | CONCRETE.<br>Wood and wood debris. | FILL | |
| 5 | | 2 | 4-6 | 10<br>12<br>14<br>14 | 26 | 1.0 | 2.2 | + | SW | | Brown (10YR 5/3) to black (10YR 7/1) well graded subangular SAND mixed with Slag, Ash, Cinder, and Brick fragments, no odor, very dense, aplastic, dry. SLAG & FILL. | SAND → ← | |
| | 740 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |
| | 735 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
+ = Positive Test Result
Samples collected 1.3-3' and 4-6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/26/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 565530.36<br>**Easting:** 13305576.07<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 5' bgs<br>**Surface Elevation:** 749.26<br><br>**Descriptions By:** S.M. Duly | **Boring ID:** RFI-05-24<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 750 | | | | | | | | | | | | |
| 0 | | | | | | | | | FL | | CONCRETE. | FILL | |
| | | 1 | 0-2 | 14<br>14<br>19<br>19 | 33 | 1.3 | 0.0 | - | ML | | Brown (10YR 5/3) SILT, little Clay, little fine subrounded to subangular Sand, no odor, dense, aplastic, dry. Fill. | SILT | Borehole backfilled with bentonite to grade. |
| | 745 | 2 | 2-5 | 3<br>4<br>4<br>3 | 8 | 1.7 | 0.0 | - | | | Becomes more Sandy with increased Sand content to some, decreased Clay content to few. Also becoming moderately dense. | | |
| 5 | | | | | | | | | | | | | |
| | 740 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |
| | 735 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3' and 3-5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/26/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 565554.07<br>**Easting:** 13305554.34<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 2' bgs<br>**Surface Elevation:** 749.88<br><br>**Descriptions By:** S.M. Duly | **Boring ID:** RFI-05-25<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | | | | | | | | | | | | |
| | | | | 4 | | | | | | | Coarse Gravel to Cobble large Aggregate. | | |
| | | 1 | 0-2 | 8<br>8<br>12 | 16 | 2 | NA | NA | ML | | Gray (10YR 5/1) SILT, some fine subangular Sand, little Clay, poorly graded, moderate to strong odor, moderately dense, damp with oily sheen in patches. Fill. | SILT | Borehole backfilled with bentonite to grade. |
| | | | | | | | | | | | Refusal. Concrete. | | |
| 5 | 745 | | | | | | | | | | | | |
| 10 | 740 | | | | | | | | | | | | |
| 15 | 735 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0-2' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/10/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2" ID x 4' Acetate Sleeve<br>**Auger Size:**<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 9' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-05-27<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | FL | | Reinforced CONCRETE. | FILL | |
| | | 1 | 1-5 | 0.4 | NA | NA | SM | | Brown (10YR 5/4) Silty fine to medium subangular SAND, few Clay, poorly graded, no odor, dense, aplastic, dry. Fill.<br><br>4.0: Color changes to brown (10YR 5/3). | SILTY SAND | Borehole backfilled with bentonite to grade (0-9' bgs). |
| 5 | 5 | 2 | 5-9 | 1 | NA | NA | | | 5.0: Color changes to brown (10YR 5/4), trace to few coarse rounded to sub-rounded Sand. | | |
| | | | | | | | | | Borehole terminated at 9'. | | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Sample collected 7-9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

Project: 64410.101 Template: j:\rockware\logplot2001\logfiles\64410\geoprobe.ldf
Data File:RFI-05-27.dat
Date: 1/10/02

| | | |
|---|---|---|
| **Date Start/Finish:** 12/10/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2" diameter, 4' long acetate sleeve<br>**Auger Size:**<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 565719.88<br>**Easting:** 13305309.76<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 9' bgs<br>**Surface Elevation:** 754.32<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-05-29<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | FL | | Reinforced CONCRETE. | FILL | |
| | | | | | | | SW | | Yellow-brown (10YR 5/4) well graded, fine to coarse subangular SAND, some Silt, no odor, dense, aplastic, dry. Fill. | SAND | Borehole backfilled with bentonite (0-9' bgs). |
| | | 1 | 0.7-4.7 | 3.8 | NA | NA | SM | | Brown (10YR 4/3) poorly graded fine to medium subrounded Silty SAND, few medium rounded gravel, no odor, dense, aplastic, dry. Fill.<br>3.2-4.8: Yellow-brown (10YR 5/4) poorly graded Silty SAND, fine sub-angular Sand, trace Clay, no odor, dense, aplastic, dry. Fill. | SILTY SAND | |
| 5 | 5 | | | | | | | | 4.8-6.1: Dark Brown (10YR 3/3) aplastic, poorly graded Silty SAND (SP), fine subangular Sand, little to few clay, no odor, dense, aplastic, damp to dry. Fill.<br>6.1-6.3: Yellow-brown (10YR 5/4) poorly graded Silty SAND, fine sub-angular Sand, trace Clay, no odor, dense, aplastic, dry. Fill. | | |
| | | 2 | 4.7-9.0 | 3.9 | NA | NA | | | 6.3-7.3: (Black 10YR 2/1) poorly graded fine to medium subrounded Silty SAND, few medium rounded gravel, no odor, very dense, aplastic, dry. Foundry/Fill Sand. | | |
| | | | | | | | CL | | Very dark brown (10YR) Silty lean CLAY, little fine to coarse sand-sized angular Slag, no odor, moderately stiff, weakly to moderately plastic, damp to dry. Till and Slag Fill. | CLAY | |
| | | | | | | | | | Borehole terminated at 9'. | | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Sample collected 7-9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/10/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allan Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4" ID HSA<br>**Rig Type:** CME 75 | **Northing:** 565329.79<br>**Easting:** 13305553.38<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 748.54<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-05-30<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-2 | 4 5 8 6 | 13 | 1.3 | NA | - | SM | Brown (10 YR ) Silty fine to coarse well-graded subangular SAND, some to little fine to coarse angular predominantly large Gravel (aggregate, decreased content with depth), few Clay, aplastic, no odor, damp, dense. Organic matter such as roots present. Aggregate fill and topsoil. | SILTY SAND |
| | | 2 | 2-4 | 5 5 6 5 | 11 | 1.7 | NA | - | ML | Yellow-brown (10 YR 5/4) SILT, some fine subangular to subrounded Sand, few to little Clay, aplastic, no odor, damp, dense. Possible fill. | SILT |
| 5 | 5 | 3 | 4-6 | 4 3 3 4 | 6 | 1.7 | NA | - | | | |
| | | 4 | 6-8 | 2 3 2 3 | 5 | 1.8 | NA | - | SP | Yellow-brown (10 YR 5/4) poorly graded fine subangular SAND, little to some Silt, few Clay, aplastic, no odor, dry, moderately dense. Possible fill sand.<br><br>Moist.<br><br>Wet.<br><br>Saturated, increasingly gray in color. | SAND |
| | | 5 | 8-10 | 1 2 4 5 | 6 | 1.7 | NA | - | | | |
| 10 | 10 | 6 | 10-12 | 2 2 5 8 | 7 | 1.6 | NA | - | | | |
| | | 7 | 12-14 | 3 4 8 7 | 12 | 1.9 | NA | - | | | |
| 15 | 15 | 8 | 14-16 | 3 5 5 4 | 10 | NA | NA | - | | Increased Silt to some, gray (10 YR 5/1). | |

**Boring Construction**

- Flush-mount cover.
- Grout 0.5-1' bgs.
- 2" ID PVC riser 0.3-6' bgs.
- Bentonite seal 1-5.5' bgs.
- Global filter sandpack 5.5-16' bgs.
- 2" ID Sch. 40 PVC 0.010"slotted screen 6-16' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0-2' and 6-8' bgs.

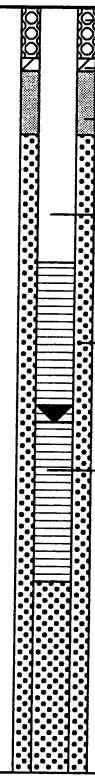
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/10/02 | 8.5' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/22/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 563375.77<br>**Easting:** 13306676.46<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** 730.56<br><br>**Descriptions By:** S. Kerr / SM Duly | **Boring ID:** RFI-07-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 730 | 1 | 0-2 | n/a<br>2<br>3<br>4 | 5 | 1.3 | 187 | - | FL | | Asphalt | FL |
| | | 2 | 2-4 | 3<br>3<br>3<br>2 | 6 | 1.2 | 297 | - | ML | | Yellow brown (10 YR 5/6) SILT. Little fine to medium subangular Sand. Damp, moderately dense, no odor. Little local oxidation. At 2.7' bgs, the Clay content increases and the sand grain-size goes from fine to coarse. Saturated at 4.5' bgs. | SILT |
| 5 | 725 | 3 | 4-6 | 4<br>6<br>7<br>8 | 13 | 1.5 | 0.0 | - | | | | |
| | | 4 | 6-8 | 3<br>4<br>8<br>7 | 12 | 1.4 | 0.0 | - | | | Grayish brown (10 YR 5/2) SILT. Saturated, dense, no odor, As above but with some fine to coarse Sand and Gravel. | |
| | | 5 | 8-10 | 6<br>15<br>28<br>34 | 43 | 1.6 | 0.0 | - | | | | |
| 10 | 720 | 6 | 10-12 | 16<br>26<br>39<br>43 | 65 | 2 | 0.0 | - | CL | | Gray (10 YR 5/1) CLAY, little Silt, few fine to coarse subangular to subrounded Sand. Dry, no odor, stiff, oxidation present. Clay Till. | CLAY |
| 15 | 715 | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.3-2.3' and 2.3-4.3' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/22/01 | 6.5' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/12/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Camperon<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4"<br>**Rig Type:** CME 75 | **Northing:** 563375.77<br>**Easting:** 13306676.46<br>**Casing Elevation:** 730.56<br><br>**Borehole Depth:** 10'<br>**Surface Elevation:** 730.94<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-07-01R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | | | See original log RFI-07-01 for geologic description for 0-8.0' bgs. | | |
| 5 | 5 | | | | | | | | | | | | Borehole backfilled with bentonite to grade. |
| | | 1 | 8-10 | 8<br>25<br>50/<br>3" | NA | 1.0 | NA | - | ML | | Yellow brown (10 YR 5/4) SILT, little fine to coarse subangular Sand, few fine to medium subangular Gravel, few to little Clay, aplastic, no odor, saturated, moderately dense to dense. | SILT | |
| | | | | | | | | | CL | | Gray (10 YR 5/1) Silty CLAY, few fine to coarse subrounded to subangular Sand, trace fine to medium subrounded Gravel, weakly plastic, dry, no odor, hard. Native glacial clay till. | | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
No soil samples collected.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/12/02 | 8.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/13/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 563585.94<br>**Easting:** 13306765.13<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** 727.47<br><br>**Descriptions By:** SM. Duly / S.C. Kerr | **Boring ID:** RFI-07-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | |
| | | 1 | 0-2 | n/a<br>n/a<br>5<br>3 | 5 | 0.5 | 961 | - | | | Concrete | FILL | |
| | | | | | | | | | SP | | Grayish brown (10 YR 5/2) fine to coarse, aplastic, subangular to subrounded SAND, some Silt, little Clay, few subangular Gravel, wet, no odor. Black Staining at 2.8'bgs. | SAND | Borehole backfilled with bentonite chips to grade. |
| | 725 | 2 | 2-4 | 2<br>1<br>1<br>2 | 2 | 1.2 | 54.5 | - | | | | | |
| | | | | | | | | | ML | | Very dark greyish brown (10 YR 3/2) SILT, some Clay, few Sand, dense, moist, no odor. Becomes black (10 YR 2/1) at 3.3' bgs. | SILT | |
| 5 | | 3 | 4-6 | 4<br>16<br>20<br>21 | 36 | 0 | 1153 | - | | | Dark gray (10 YR 4/1) Sandy CLAY, little fine to medium Sand, some Silt, soft, moist to wet, no odor. No recovery from 4'-6' bgs (rock in shoe). | CLAY | |
| | | 4 | 6-8 | 4<br>15<br>19<br>22 | 34 | 2 | 70.6 | - | | | Saturated at 6.2' bgs. Increased coarse Sand to 6.6' bgs. | | Temporary well screen installed at 8'-3' bgs. |
| | 720 | | | | | | | | | | Dark gray (10 YR 4/1) CLAY, trace subangular Gravel, some Silt, little fine to medium subangular to subrounded Sand. Hard, dry, no odor. Oxidation along fractures until 9' bgs. Clay Till. | | |
| | | 5 | 8-10 | 7<br>30<br>55/<br>5" | 80 | 1.6 | 348 | - | CL | | | | |
| 10 | | 6 | 10-12 | 9<br>16<br>21<br>34 | 37 | 1.8 | 2349 | NA | | | | | |
| | 715 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
PID background : 0.0 ppm
Samples collected 0.8-2.8' and 2.8-4.8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/13/01 | 6.2' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/14/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 563659.33<br>**Easting:** 13306888.58<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** 726.74<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-07-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | | | |
| | 725 | 1 | 0-2 | 4 5 5 6 | 10 | 2.0 | 2248 | - | ML | | Black (10 YR 2/1) SILT, some fine to coarse subangular Sand, some fine to coarse subangular Gravel all composed of anthracite Coal, little Clay, aplastic, no odor, moderately dense to moderately loose, damp, few topsoil and vegetation present. | SILT | Portland Cement 0-0.6' bgs<br>Grout 0.6-0.8' bgs<br>BentoniteSeal0.8-1' bgs<br>Sch 40 PVC Riser 0-2' bgs |
| | | 2 | 2-4 | 3 4 6 6 | 10 | 1.5 | 854 | - | CH | | Very dark grayish-brown (10 YR 5/4) SILT, some Clay, little fine to medium subangular Sand, aplastic, no odor, damp, moderately dense. | CLAY | |
| | | | | | | | | | | | Brown (10 YR 4/3) fat CLAY, some Silt, little fine to medium subangular Sand, trace fine to medium subrounded Gravel, soft to medium stiff, no odor, damp. | | |
| | | | | | | | | | ML | | Yellow-brown (10 YR 5/4) SILT, little fine to medium subangular Sand, little to few Clay, no odor, saturated, moderately dense. | SILT | |
| 5 | | 3 | 4-6 | 16 25 25 31 | 50 | 1.8 | 83.9 | - | CL | | Gray (10 YR 4/1) lean CLAY, some Silt, little fine to medium subrounded to subangular Sand, few fine to medium subangular to subrounded Gravel, no odor, dry, very hard. Clay Till locally oxidized along fractures and selvages (mottled) to dark yellow brown (10 YR 4/4) to 6.2' bgs. | CLAY | #5 Global Filler Sand Pack 2-7' bgs |
| | 720 | 4 | 6-8 | 11 26 31 36 | 57 | 2.0 | 8.5 | - | | | | | Sch 40 0.010" Slot PVC Screen 2-7' bgs<br>PVC Cap |
| | | 5 | 8-10 | 22 43 50/5" | NA | 1.4 | 0.0 | - | | | | | |
| 10 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0-2' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/14/01 | 3.6' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/14/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:**<br>**Rig Type:** CME 55 | **Northing:** 563920.76<br>**Easting:** 13306896.52<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 11' bgs<br>**Surface Elevation:** 733.01<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-07-04<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 4 5 5 6 | 10 | 1.9 | 862 | - | ML | | Gray-brown (10 YR 5/2) SILT, little fine to coarse subangular Sand, fine to coarse subangular ("pea") Gravel and black Sand to Gravel-sized anthracite Coal, aplastic, no odor, damp, moderately dense. Vegetation and roots present. Topsoil mixed with anthracite coal and Gravel fill. | SILT | |
| | | | | | | | | | FL | | | COAL | |
| | | 2 | 2-4 | 6 4 3 8 | 7 | 1.3 | 118 | - | ML | | Black (10 YR 2/1) fine to coarse Sand to Pebble-sized Anthracite COAL, aplastic, no odor, dry, moderately dense. | FILL | |
| | 730 | | | | | | | | | | Gray (2.5 YR 5/1) SILT, some to little Clay and fine to coarse Sand to Gravel-sized fragments of Anthracite Coal, aplastic, no odor, dense, dry. | | |
| 5 | | 3 | 4-6 | 5 5 5 6 | 10 | 1.6 | 0.0 | - | CL | | Gray (10 YR 5/1) lean CLAY, some Silt, little fine to medium subangular Sand, few fine to medium subrounded to subangular Gravel; no odor, dry, dense, hard, locally oxidized along fractures and selvages to yellow brown (10 YR 5/4). Clay Till. | CLAY | Bentonite (0.0-11.0' bgs) |
| | | 4 | 6-8 | 2 2 4 5 | 6 | 1.3 | 0.0 | - | | | Becomes softer and damp; soft to medium stiff @ 6'bgs.<br>Moist and soft. | | |
| | 725 | | | | | | | | SP | | Yellow brown (10 YR 5/4) fine subangular poorly graded SAND, some Silt, little Clay, few coarse subrounded to subangular Gravel, no odor, wet (saturated), moderately dense. | SAND | |
| 10 | | 5 | 8-10 | 11 33 50/ 5" | NA | 1.0 | 0.0 | - | CL | | Gray (10 YR 5/1) CLAY as at 2.7-7.7' bgs, but very hard, with oxidation to yellow-brown (10 YR 5/4) along fractures and selvages. Clay Till. | CLAY | |
| | | 6 | 10-11 | 43 50/ 4" | NA | NA | 0.0 | - | | | | | |
| | 720 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Set temp well, 9' bgs with screen 9-4', 0.010" Slot
Samples collected 0-2' and 2-4' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/14/01 | 7.1' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/14/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 563195.82<br>**Easting:** 13306478.26<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 732.73<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-07-05<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | | | | | | | | | | | | |
| 0 | | | 0-1 | NA | NA | NA | NA | NA | FL | | Concrete. | FILL | |
| | 730 | 1 | 1-3 | 9<br>11<br>10<br>9 | 21 | 1.2 | 2393 | - | ML | | Yellow-brown (10 YR 5/6) SILT, some fine subangular Sand, trace Clay, aplastic, no odor,.damp, loose to moderate density, fill. | SILT | |
| | | 2 | 3-5 | 9<br>9<br>10<br>9 | 19 | 1.4 | 74.7 | - | | | Increased coarseness to a fine subangular SAND with some Silt, No Clay. | | |
| 5 | | 3 | 5-7 | 9<br>10<br>11<br>12 | 21 | 2.0 | 78.1 | - | CL | | Dark grayish-brown (10 YR 4/2) CLAY, some Silt, little fine to medium subrounded to subangular Sand, trace to few fine to medium subangular to subrounded Gravel, no odor, dry, very hard to hard. Clay Till. | CLAY | |
| | 725 | 4 | 7-9 | 5<br>7<br>9<br>9 | 16 | 2.0 | 0.0 | - | ML | | Pale brown (10 YR 6/3) SILT, some fine subangular Sand, trace Clay, aplastic, no odor, damp, loose to moderate density.<br>Becomes softer and damp; soft to medium stiff at 6.0' to 7.1' bgs.<br>Moist and soft from 7.1' to 7.7' bgs. | SILT | Bentonite (0.0 to 19.0' bgs). |
| 10 | | 5 | 9-11 | 4<br>6<br>7<br>9 | 13 | 1.6 | 0.0 | - | | | | | |
| | 720 | 6 | 11-13 | 3<br>3<br>4<br>3 | 7 | 1.4 | 0.0 | - | | | Gray (10 YR 6/1), saturated.<br>Brown (10 YR 5/3), saturated. | | |
| | | 7 | 13-15 | 3<br>2<br>5<br>3 | 7 | 1.5 | 0.0 | - | | | Gray (10 YR 6/1), saturated.<br>Moist. | | |
| 15 | | 8 | 15-17 | 9<br>16 | 33 | 1.3 | 0.0 | - | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Set 1" diam., 0.010' slot temp well screen 8-18' bgs.
Samples collected 5-7' and 9-11' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/14/01 | 11.8' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-07-05

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 15-17 | 17 23 | 33 | 1.3 | 0.0 | - | SP | | Subrounded to subangular SAND, some to little fine to coarse subrounded Gravel, little to few Silt; no odor, including fossiliferous, loose, saturated, riverine/alluvial deposit, moderately high energy envirnoment of deposition. | SAND | Bentonite (0.0 to 19.0' bgs). |
| | 715 | 9 | 17-19 | 12 20 33 36 | 53 | 1.6 | 0.0 | - | CL | | Homogenous gray (10 YR 5/1) CLAY, with oxidation confied to 1 to 3 inches only, very hard to hard, increasing hardness with depth. | CLAY | |
| 20 | | | | | | | | | | | | | |
| | 710 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 705 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 700 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Set 1" diam., 0.010' slot temp well screen 8-18' bgs.
Samples collected 5-7' and 9-11' bgs.

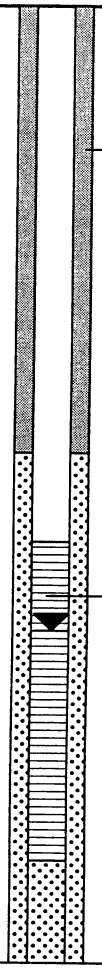
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/14/01 | 11.8' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/20/01 / 9/6/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau/Greg Compeau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:**<br>**Rig Type:** mule-mounted Geoprobe | **Northing:** 563381.88<br>**Easting:** 13306593.09<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 15' bgs<br>**Surface Elevation:** 732.88<br><br>**Descriptions By:** S Kerr / SM Duly | **Boring ID:** RFI-07-06<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | | | | | | | | | |
| 0 | | | | | | | FILL | | Concrete | Fill |
| | | 1 | 0-2 | 1.4 | >9999 | NA | SP | | Pale brown (10 YR 6/3) fine SAND, trace subrounded Gravel, loose, no odor, dry.<br>Damp. | Sand |
| | 730 | 2 | 2-4 | 2.0 | >9999 | NA | ML/ SM | | Brown (10 YR 5/3) SILT, trace Clay, trace fine to coarse Sand, trace medium Gravel, loose, no odor, damp.<br>Increased Clay to Silty CLAY, dense. | SILT |
| 5 | | 3 | 4-6 | 2.0 | >9999 | NA | CL | | Brown (10 YR 5/3) and gray (10 YR 6/1) mottled CLAY, some Silt, little fine to coarse Sand, oxidized, stiff, no odor, damp. | Clay |
| | | 4 | 6-8 | 1.6 | >9999 | NA | ML | | Yellow-brown (10 YR 5/6) SILT, trace Clay, trace fine Sand, moderately dense, aplastic, moist. | SILT |
| | 725 | 5 | 8-10 | 2.0 | >9999 | NA | | | Saturated. | |
| 10 | | 6 | 10-12 | 1.7 | >9999 | NA | | | Grayish-brown (10 YR 5/2) Clayey SILT, no odor, saturated. | |
| | | | | | | | SP | | Grayish-brown (10 YR 5/2) fine to coarse SAND, dense, saturated. | |
| | 720 | 7 | 12-14 | 2.0 | >9999 | NA | CL | | Gray (10 YR 5/1) CLAY, trace fine to coarse Sand, aplastic, stiff, no odor, damp.<br>Dry. | CLAY |
| 15 | | 8 | 14-15 | NA | NA | NA | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.5-2.5'; 6.5-8.5' bgs.
Temporary well screened 8.4-13.4' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/20/01 | 9.8' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/20/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:**<br>**Rig Type:** mule-mounted Geoprobe | **Northing:** 563199.88<br>**Easting:** 13306652.24<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 24' bgs<br>**Surface Elevation:** 732.81<br><br>**Descriptions By:** S Kerr | **Boring ID:** RFI-07-07<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | | | | | | | | | | |
| 0 | | | | | | | FILL | | Concrete | FILL | |
| | | 1 | 0-2 | 1.5 | >9999 | NA | SM | | Yellow-brown (10 YR 5/4) fine to medium SAND, some Silt, trace medium to coarse subrounded Gravel, trace Clay to 1.3' bgs, moderately loose, no odor, dry. | SAND | |
| | 730 | 2 | 2-4 | 1.5 | >9999 | NA | | | | | |
| | | 3 | 4-6 | 2.0 | >9999 | NA | | | Damp.<br>Some fine to coarse gravel to 4.6' bgs. | | |
| 5 | | 4 | 6-8 | 2.0 | >9999 | NA | SM | | Yellow-brown (10 YR 5/4) Silty fine to medium SAND, heavily oxidized, some Clay to 5.3' bgs, moderately loose, no odor, damp. | SILTY SAND | Borehole backfilled with bentonite chips to grade. |
| | 725 | 5 | 8-10 | 1.8 | >9999 | NA | | | Wet. | | |
| 10 | | 6 | 10-12 | 1.5 | >9999 | NA | ML | | Brownish-yellow (10 YR 6/6) SILT, some fine to medium Sand, heavily oxidized, loose, no odor, damp. | SILT | |
| | 720 | 7 | 12-14 | 1.6 | >9999 | NA | SM | | Pale brown (10 YR 6/3) fine SAND, some Silt, moderately loose, no odor, moist. | SAND | |
| | | | | | | | | | Increased coarseness to fine to medium. | | Temporary well screen installed at 12-22' bgs. |
| 15 | | 8 | 14-16 | 1.7 | >9999 | NA | ML | | Silt as at 9.2' bgs. | silt &clay | |
| | | | | | | | CL | | Gray (10 YR 5/1) CLAY, highly plastic, soft, no odor, moist. | | |
| | | | | | | | ML | | | | |
| | | | | | | | SP | | Brown (10 YR 5/3) SILT, trace fine Sand, dense, no odor, wet. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected at 0.5-2.5'; 8.5-10.5'; 14.5-16.5' bgs.
pp=pocket penetrometer

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/20/01 | 17.2' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-07-07

**Borehole Depth:** 24' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 1.8 | >9999 | NA | SP | | Yellow-brown (10 YR 5/6) fine to medium SAND, moderately loose, no odor, wet. | SAND | |
| | 715 | | | | | | | | 17.2': Brown (10 YR 5/3) fine to medium SAND, little Silt, moderately loose, no odor, saturated. | | |
| | | 10 | 18-20 | 2.0 | >9999 | NA | | | As above, fine to coarse SAND, predominantly medium-grained. | | |
| 20 | | | | | | | | | Saturated, sand as at 19.2' bgs. Predominantly fine-grained. | | Temporary well screen installed at 12-22' bgs. |
| | | 11 | 20-22 | 2.0 | NA | NA | | | Increased coarse sand. | | |
| | | | | | | | CL | | Gray (10 YR 5/1) CLAY. | | |
| | | | | | | | SP | | Sand as at 20.2' bgs. | | |
| | 710 | 12 | 22-24 | 2.0 | NA | NA | CL | | Gray (10 YR 5/1) CLAY, trace fine to coarse Sand, trace coarse Gravel, stiff (pp>4.5 tons/sq. ft.), no odor. Clay Till. | CLAY | |
| 25 | | | | | | | | | | | |
| | 705 | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| | 700 | | | | | | | | | | |
| 35 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected at 0.5-2.5'; 8.5-10.5'; 14.5-16.5' bgs.
pp=pocket penetrometer

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/20/01 | 17.2' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/30/01<br>**Drilling Company:** RAU<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID HSA<br>**Rig Type:** CME 55 | **Northing:** 563062.19<br>**Easting:** 13306928.48<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 23.5 bgs<br>**Surface Elevation:** 728.12<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-07-08<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 3 4 5 5 | 9 | 1.2 | 0.0 | NA | ML | | Light brownish gray (10 YR 6/2) SILT, some fine to coarse Sand, trace coarse Gravel, roots, loose, dry, no odor. Topsoil | SILT | Portland Cement (0.0' -1.0' bgs) |
| | | | | | | | | | | | As above, but yellow brown (10 YR 5/6), trace Clay. | | |
| | 725 | 2 | 2-4 | 5 7 9 9 | 16 | 0.4 | 0.0 | NA | ML | | | | 2" ID Riser (0.0' - 10.0' bgs) |
| 5 | | 3 | 4-6 | 4 7 9 13 | 16 | 1.2 | 0.0 | NA | SP<br>CL | | Yellow brown (10 YR 5/6) predominantly fine to medium poorly graded SAND, little Silt, loose, moist, no odor, some oxidation. | | Grout (1.0' - 6.0' bgs) |
| | | | | | | | | | | | Brown (10 YR 5/3) lean CLAY, little fine to coarse Sand, stiff, damp, no odor, local oxidation. | | |
| | | 4 | 6-8 | 4 6 9 10 | 15 | 1.4 | 0.0 | NA | | | SAND as above from 4.8' - 5.1' bgs, poorly graded, moist. | SAND | Bentonite Seal (6.0 to 8.0' bgs) |
| | 720 | 5 | 8-10 | 4 6 7 10 | 13 | 1.4 | 0.0 | NA | | | | | |
| 10 | | | | | | | | | SP | | Predominantly medium-grained. | | #5 Global Filter Pack (8.0 to 25.5' bgs) |
| | | 6 | 10-12 | 3 4 5 8 | 9 | 1.5 | 2.4 | NA | | | Moist to wet | | |
| | | | | | | | | | | | Saturated | | |
| | 715 | 7 | 12-14 | 2 3 6 5 | 9 | 1.4 | 0.0 | NA | | | Brown (10 YR 5/3) fine to medium well graded SAND, loose, saturated, no odor. | | Sch 40 machined 0.010" Slot PVC Screen (10.0' - 20.0' bgs). |
| 15 | | 8 | 14-16 | 4 7 13 16 | 20 | 1.6 | 0.0 | NA | CL | | Gray (10 YR 5/1) lean CLAY, trace fine to coarse Sand, stiff, dry, aplastic, pp>4.5. | CLAY | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/30/01 | 12.6' bgs | |

Project: 64410.022 Template: j:\rockware\logplot2001\logfiles\64410\Auger_well.ldf
Data File:RFI-07-08.dat Date: 11/19/01

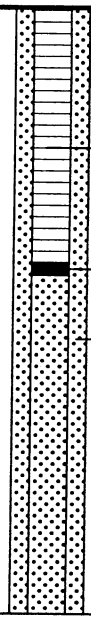
**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-07-08

**Borehole Depth:** 23.5 bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Blind drilled to 22.5' bgs, geotechnical samples collected. | | |
| | 710 | NA | NA | NA | NA | NA | NA | NA | | | | | Sch 40 machined 0.010" Slot PVC Screen (10.0' - 20.0' bgs). |
| 20 | | | | | | | | | | | | | PVC Cap |
| | | 9 | 21.5-2 | 10 37 50/ 5" | NA | 1.5 | NA | NA | | | | | #5 Global Filter Pack (8.0 to 25.5' bgs) |
| | 705 | | | | | | | | | | | | |
| | | 10 | 23.5-2 | 21 37 50/ 5" | NA | NA | NA | NA | | | | | |
| 25 | | | | | | | | | | | | | |
| | 700 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 695 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |



BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/30/01 | 12.6' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/14/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 563827.44<br>**Easting:** 13306761.73<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12.0 bgs<br>**Surface Elevation:** 729.68<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-07-09<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 2 4 4 3 | 8 | 1.5 | 131 | - | ML | | Gray-brown (10YR 5/2) SILT, little fine to coarse subangular Sand, little to some silt to cobble-sized subangular black fragments of Anthracite Coal, aplastic, damp, moderately dense to moderately loose, no odor. Few vegetation and roots, topsoil mixed with anthracite coal. | SILT | Bentonite (0.0 to 12.0' bgs) |
| | | 2 | 2-4 | 3 2 2 4 | 4 | 1.6 | 0.0 | - | | | Yellow-brown (10 YR 5/4) SILT, some Clay, little fine to medium subangular Sand, few fine to medium subrounded to subangular Sand, local lenses of silt to coarse gravel-sized anthracite Coal, aplastic, dense, damp, no odor. Moist at 2.0' bgs. | | |
| | 725 | | | | | | | | | | Dark gray-brown (10 YR 4/2) SILT, some Clay, little fine to medium subrounded to subangular Sand, trace old roots, wet, moderately dense, no odor. | | |
| 5 | | 3 | 4-6 | 4 9 16 21 | 25 | 1.6 | 0.0 | - | CL | | Yellow-brown (10 YR 5/4) lean CLAY, heavily oxidized with yellow-brown (10 YR 5/4) along fractures and selvages, some Silt, little fine to medium subrounded to subangular Sand, trace to few fine to medium subangular to subrounded Gravel, very hard, dry, no odor. Native Till. | CLAY | |
| | | | | | | | | | ML | | | SILT | |
| | | 4 | 6-8 | 11 29 50/ 5" | NA | NA | 0.0 | - | CL | | SILT as at 2.7-4.3' bgs, but pale brown (10 YR 6/3), saturated, no odor, few coarse Gravel at 6' bgs. | CLAY | |
| | | 5 | 8-10 | 13 40 50/ 5" | NA | 1.4 | 68.5 | - | | | CLAY as at 4.3-5.7' bgs, but gray brown (10 YR 5/2), with local oxidation(yellow-brown 10 YR 5/4) along selvages and fractures. Becomes gray (10 YR 5/1). Clay Till. | | |
| | 720 | | | | | | | | | | | | |
| 10 | | 6 | 10-12 | 27 53 50/ 4" | NA | 1.2 | 3233 | - | | | No oxidation after 10.0' bgs. | | |
| | 715 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0-2' bgs.

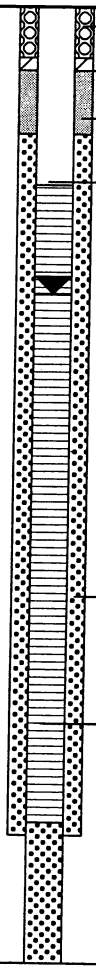
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/14/01 | 2.7' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/29/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 559602.42<br>**Easting:** 13305517.7<br>**Casing Elevation:** 725.15<br><br>**Borehole Depth:** 15' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 725 | | Auger | NA | NA | NA | NA | NA | | | ASPHALT. | FILL |
| | | 1 | 1-3 | 1 1 2 1 | 3 | 1.1 | 8.1 | - | ML | | Dark gray-brown aplastic SILT, little fine to coarse Sand and Gravel, trace Clay, earthy odor, damp, moderately loose, saturated at 4.5' bgs. | SILT |
| | | 2 | 3-5 | 2 3 3 3 | 6 | 0.6 | 9.1 | - | | | | |
| 5 | 720 | 3 | 5-7 | 1 1 2 4 | 3 | 1.1 | 4.8 | - | | | Orange aplastic SILT, some Clay, little fine to medium Sand, saturated, moderately loose to moderately dense. | SILT |
| | | 4 | 7-9 | 1 3 3 3 | 6 | 2.0 | 8.0 | - | | | | |
| 10 | 715 | 5 | 9-11 | 2 2 2 3 | 4 | 1.8 | 39 | - | | | | |
| | | 6 | 11-13 | 4 4 4 6 | 8 | 1.8 | 5.5 | + | | | | |
| | | 7 | 13-15 | 16 17 19 31 | 36 | 1.6 | 5.2 | - | CL | | Orange CLAY, some Silt, little fine to medium Sand, trace fine to medium Gravel, dry to damp, hard. | CLAY |
| 15 | 710 | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
+ = Positive Test Result
NA = Not Applicable/Not Available
Sample collected 1-3' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/29/01 | 4.5' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/16/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allan Rice<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2" continous acetate sleeve<br>**Auger Size:**<br>**Rig Type:** Geoprobe | **Northing:** 559559.1<br>**Easting:** 13305493.87<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** 726.41<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-09-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | ASPHALT. | asphalt | Borehole backfilled with Bentonite to grade. |
| | | | | | | | | | ASPHALT fragmants. | | |
| | 725 | 1 | 0-2 | 2.0 | 80.3 | - | FL | | Very dark grayish-brown (10YR 3/2) fine Silty SAND, trace Clay, trace subangular to subrounded Gravel, medium dense, no odor, dry. | | |
| | | | | | | | | | Olive-brown (2.5YR 4/3) fine to medium SAND, trace Clay, trace subrounded to subangular Gravel, dense, no odor, dry. | SAND | |
| | | | | | | | | | Light yellowish-brown (2.5Y 6/3) medium SAND, trace red fragments (brick), dense, moist. Fill. | | |
| | | 2 | 2-4 | 1.6 | 61.1 | - | | | Very dark brown (10YR 2/2) medium to coarse SAND, trace Clay, very dense, wet. | | |
| | | | | | | | | | Yellow (2.5Y 8/6) coarse SAND, some solid chunks of Sand, loose, saturated at 4' bgs. | | |
| | | | | | | | SP | | Brown (10YR 4/3) fine SAND, dense, no odor, moist. | | |
| 5 | | 3 | 4-6 | 1.6 | 44.8 | - | | | | | |
| | | | | | | | ML | | Dark grayish-brown SILT, trace fine Sand and Clay, dense, no odor, wet. | | |
| | | | | | | | SP | | SAND, as at 3' - 5.2' bgs. | SAND | |
| | 720 | 4 | 6-8 | 1.7 | 14.4 | - | | | Light olive-brown and gray (2.5Y 5/6 and 6/1) SILT, mottled, dense, moist. All gray Silt at 7' bgs. | SILT | |
| | | | | | | | ML | | | | |
| | | 5 | 8-10 | 1.6 | 22.8 | - | | | | | |
| 10 | | | | | | | | | | | |
| | 715 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.4-2' and 2-4'.
1" Temporary Well set at 8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/16/01 | 4' | NA |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/16/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2" continous acetate sleeve<br>**Auger Size:** 2 1/4"<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 559436.94<br>**Easting:** 13305471.1<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** 726.02<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-09-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | FL | | ASPHALT. | Fill | |
| | 725 | 1 | 0-2 | 1.6 | 37.5 | - | MW | | Very dark brown (10YR 2/2) fine Silty SAND, trace Clay, trace subrounded to subangular Gravel, dense, no odor, dry. | S. Sand | |
| | | | | | | | SP | | Brown (10YR 4/3) fine to medium SAND, trace coarse Sand, Silt, and Clay, dense, no odor, moist. | Sand | Borehole backfilled with Bentonite to grade. |
| | | 2 | 2-4 | 1.5 | 33.7 | - | | | Olive-brown (2.5YR 4/3) fine SAND, trace Clay, dense, moist, wet at 3.4'bgs, saturated at 4' bgs. | | |
| | | | | | | | | | (3.8-4.4) Fine SAND as above with trace medium to coarse Sand, loose. | | |
| 5 | | 3 | 4-6 | 1.8 | 41.5 | - | ML | | Gray to light olive-brown (2.5Y 5/1 and 5/6) SILT, mottled, dense, no odor, moist to wet. | Silt | |
| | 720 | 4 | 6-8 | 1.6 | 24.6 | - | | | (6.7-8.0) SILT as above but all gray. | | |
| | | 5 | 8-10 | 0.0 | NA | - | | | No Recovery. | | |
| 10 | | | | | | | ML | | SILT as at 4.4' - 6.7' bgs. | | |
| | 715 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collect from 0.4-2' and 2-4'.
1" Temporary Well set at 8' bgs.

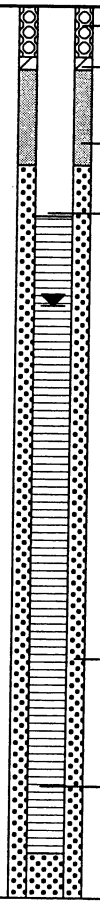
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/16/01 | 4' | NA |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/30/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 559224.65<br>**Easting:** 13305418.05<br>**Casing Elevation:** 725.92<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-04<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 725 | 1 | 0-2 | - 39 25 15 | 64 | 1.4 | 14.7 | + | ML | | Light brown-gray SILT, some fine to medium Sand, little fine to coarse Gravel, trace organic matter, damp, dense. Fill, Topsoil. | SILT |
| | | 2 | 2-4 | 12 15 10 8 | 25 | 1.5 | 5.9 | - | | | Black SILT, some fine to coarse SAND, little fine to medium Gravel and Clay, dry, dense. | |
| 5 | 720 | 3 | 4-6 | 2 4 5 6 | 9 | 1.8 | 10.2 | - | | | Gray-brown SILT, little fine to medium Sand, trace Clay, saturated, dense. | |
| | | 4 | 6-8 | 3 4 7 7 | 11 | 1.9 | 4.3 | - | | | | |
| | | 5 | 8-10 | 3 4 4 11 | 8 | 2.0 | 1.0 | - | | | | |
| 10 | 715 | 6 | 10-12 | 4 12 13 15 | 25 | 1.5 | 1.5 | - | SP | | Yellow-brown fine to coarse SAND, little Silt and fine to medium Gravel, saturated, loose. | SAND |
| | | 7 | 12-14 | 19 17 17 12 | 34 | 1.3 | 3.4 | - | | | | |
| 15 | 710 | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
+ = Positive Test Result
NA = Not Applicable/Not Available
Samples collected 0-2' and 2-4' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/30/01 | 4.7' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-09-04R

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | 2" ID Sch. 40 PVC 0.010"slottedscreen 14-19' bgs. #5 Global filter sandpack 13-19' bgs. |
| 20 | 705 | | | | | | | | | | | | |
| 25 | 700 | | | | | | | | | | | | |
| 30 | 695 | | | | | | | | | | | | |
| 35 | 690 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Stratigraphic Descriptions are from RFI-09-04.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/16/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2" continous acetate sleeve<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 559748.04<br>**Easting:** 13305255.34<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** 730.99<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-09-05<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | FL | | ASPHALT. | FILL | |
| | 730 | 1 | 0-2 | 1.5 | 36 | - | SM | | Very dark brown (10YR 2/2) Silty SAND, trace subrounded and subangular Gravel, trace Clay, aplastic, dense, dry, no odor. Fill. | SAND/SILTY SAND | |
| | | | | | | | SP | | Yellowish-brown fine to medium SAND, trace Clay, aplastic, dense, no odor, dry. Fill. | | |
| | | | | | | | SM | | Very dark grayish-brown fine Silty SAND, trace subrounded Gravel and small brick-like fragments and Clay, dense, no odor, dry.Fill. | | |
| | | | | | | | | | Yellowish-brown (10YR 5/4) fine Silty SAND, little shiny black particles, medium dense, no odor, dry. Fill. | | Borehole backfilled with Bentonite to grade. |
| | | 2 | 2-4 | 1.0 | 20.1 | - | ML | | Yellow-brown (10YR 5/4) SILT, trace fine Sand, trace Silt. | | |
| | | | | | | | FL | | CONCRETE rubble. | | |
| | | | | | | | ML | | Yellow-brown (10YR 5/4) Sandy SILT, aplastic, dense, no odor, moist. | SILT/SILTY SAND | |
| | | | | | | | SM | | Brown (10YR 4/3) fine to medium Silty SAND, trace subrounded to subangular Gravel, medium dense, no odor, moist. | | |
| 5 | | 3 | 4-6 | 1.8 | 25.6 | - | ML | | Yellow-brown (10YR 5/6) SILT, little fine Sand, trace Clay, dense, moist. | | |
| | 725 | | | | | | | | Yellow-brown (10YR 5/6) Sandy SILT, trace medium Sand and small brick-like fragments, medium dense, no odor, moist. | | |
| | | 4 | 6-8 | 2.0 | 30.5 | - | | | Yellow-brown and gray (10YR 5/6 and 6/1) SILT, trace Clay, mottled, dense, moist. | | |
| | | 5 | 8-10 | 2.0 | 59.4 | - | | | Yellowish-brown (10YR 5/6) Sandy SILT, trace subangular Gravel, dense, moist, saturated at 9.1' bgs. | | |
| 10 | | | | | | | | | | | |
| | 720 | 6 | 10-12 | 1.9 | 22.7 | - | SM | | Light yellow-brown (10YR 6/4) fine Silty SAND, dense to moderately dense, no odor, saturated. | | |
| | | 7 | 12-14 | 2.0 | 32.3 | - | ML | | Dark gray (10YR 4/1) SILT, trace Clay, moderately dense, no odor, moist. | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collect from 0.5-2' and 6-8'.
1" Temporary Well set at 13' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/16/01 | 9.1' | NA |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/30/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID HSA<br>**Rig Type:** CME 55 | **Northing:** 559901.6<br>**Easting:** 13305367.91<br>**Casing Elevation:** 727.66<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-06<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | | |
| 0 | | | | | | | | | FILL | | CONCRETE. | FILL |
| | | 1 | 0-2 | - 12 12 15 | 24 | 1.1 | 115.0 | - | ML | | Very dark gray-brown (10YR 3/2) SILT, little fine to coarse subangular Sand, little to few Clay, few fine to coarse angular to subangular Gravel, weak odor, damp, moderately dense to loose. | SILT |
| | 725 | 2 | 2-4 | 12 12 5 6 | 17 | 0.8 | 95.5 | - | | | Some Clay. | |
| 5 | | 3 | 4-6 | 1 2 3 7 | 5 | 1.5 | 65.9 | - | SP | | Gray-brown (10YR 5/2) fine to coarse subangular aplastic SAND, little Silt and fine to coarse subrounded to subangular Gravel, few Clay, weak odor, moist, loose, saturated at 5.0 bgs. | SAND |
| | | 4 | 6-8 | 7 12 11 8 | 23 | 1.6 | 2803 | + | | | | |
| | 720 | | | | | | | | ML | | Black (10YR 2/1) SILT as at 0.5-4.7' bgs, but dense, saturated. | CLAY |
| | | 5 | 8-10 | 4 8 12 17 | 20 | 1.6 | 2162 | + | CL | | Gray (10YR 5/1) CLAY, some Silt, little fine to medium subangular Sand, trace subrounded fine to medium Gravel, damp, hard, no odor, locally oxidized to yellow brown (10YR 5/6) along fractures and selvages. | |
| 10 | | 6 | 10-12 | 12 13 15 16 | 28 | 1.0 | 2386 | + | SP | | SAND as at 4.7-7.5' bgs, but black (10YR 2/1), oily, strong odor. | SAND |
| | 715 | 7 | 12-14 | 8 10 10 12 | 20 | 1.6 | 87.9 | - | ML | | Gray (10YR 5/1) SILT, few to little fine to medium subangular (predominantly fine) Sand, little Clay, weak odor, damp, dense.<br>Moist to saturated.<br>1" wide sand seam, moist. | SILT |
| 15 | | | | | | | | | | | | |

**Boring Construction**

- Cement pad with 9" diam. flush-mount cover.
- Grout 0.8-1' bgs.
- Bentonite hole plug seal 1-2.7' bgs.
- 2" ID Sch. 40 PVC riser 0.3-3.5' bgs.
- #5 Global filter sandpack 2.7-14' bgs.
- 2" ID Sch. 40 PVC 0.010"slottedscreen 3.5-13.5' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
+ = Positive Test Result
NA = Not Applicable/Not Available
Samples collected 0.5-2.5' and 2.5-4.5' bgs.

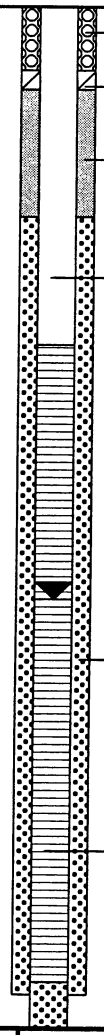
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/30/01 | 5.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/29/01 - 5/30/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 559948.49<br>**Easting:** 13305603.85<br>**Casing Elevation:** 727.51<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-07<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | | |
| 0 | | | Auger | NA | NA | NA | NA | NA | Fill | | ASPHALT. | FILL |
| | 725 | 1 | 1-3 | 10<br>3<br>3<br>2 | 6 | 0.6 | 2.5 | - | ML | | Dark gray-brown aplastic SILT, some fine to coarse Sand. little Clay, damp, moderately loose to moderatley dense. | SILT |
| | | 2 | 3-5 | 1<br>2<br>2<br>3 | 5 | 1.8 | 5.4 | - | | | | |
| 5 | | 3 | 5-7 | 1<br>1<br>3<br>4 | 4 | 1.0 | 5.0 | - | SP | | Yellow-brown quartz-rich, fine to medium aplastic SAND, some Silt, damp, moderately loose. | SAND |
| | 720 | 4 | 7-9 | 1<br>3<br>4<br>5 | 7 | 1.2 | 4.3 | - | | | | |
| 10 | | 5 | 9-11 | 3<br>4<br>3<br>5 | 7 | 2.0 | 4.6 | - | ML | | Brown aplastic SILT, little fine to medium Sand, trace Clay, damp, moderately dense.<br>Gray-brown Silty CLAY, little fine to medium Sand, damp, very dense.<br>Orange aplastic SILT, some Clay, saturated, dense to moderately dense. | SILT |
| | 715 | 6 | 11-13 | 2<br>50<br>19<br>15 | 69 | 1.7 | 1210 | + | | | | |
| 15 | | 7 | 13-15 | 3<br>11<br>12<br>13 | 23 | NA | 1069 | + | SP | | Yellow-brown quartz-rich, fine to medium aplastic SAND, some Silt, saturated, oil present, moderately loose. | SAND |
| | | 8 | 15-17 | 6<br>10 | 25 | 1.8 | 551 | + | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
+ = Positive Test Result
NA = Not Applicable/Not Available
Samples collected 1-3' and 3-5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/30/01 | 9.3' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-09-07

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 15-17 | 15<br>25 | 25 | 1.8 | 551 | + | SP<br>ML | | Yellow-brown quartz-rich, fine to medium aplastic SAND, some Silt, saturated, oil present, moderately loose.<br>Orange SILT, damp. | | #5 Global filter sandpack 3.3-17' bgs |
| | 710 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | |
| | 705 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 700 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 695 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
+ = Positive Test Result
NA = Not Applicable/Not Available
Samples collected 1-3' and 3-5' bgs.

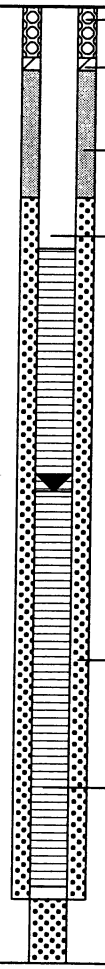
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/30/01 | 9.3' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/29/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 560189.77<br>**Easting:** 13305655.95<br>**Casing Elevation:** 728.45<br><br>**Borehole Depth:** 15' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-08<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | | |
| 0 | | | Auger | NA<br>NA | | | | | FILL | | CONCRETE. | FILL |
| | | 1 | 1-3 | 2<br>4<br>24<br>13 | 28 | 1.6 | 8.1 | - | ML | | Black and yellow-brown aplastic SILT, little fine Sand and Gravel, trace Clay, Concrete, Asphalt, and Wood, very dense to dense, slight hydrocarbon odor, moist to saturated at 7.6'. | SILT |
| | 725 | 2 | 3-5 | 11<br>15<br>16<br>12 | 31 | 1.8 | 8.0 | - | | | | |
| 5 | | 3 | 5-7 | 5<br>8<br>9<br>6 | 17 | 1.6 | 133 | + | | | | |
| | | 4 | 7-9 | 4<br>4<br>5<br>6 | 9 | 1.7 | 75.2 | + | ML | | Gray aplastic SILT and CLAY, little fine Sand, slight hydrocarbon odor, saturated, very dense. | SILT and CLAY |
| | 720 | | | | | | | | | | | |
| 10 | | 5 | 9-11 | 1<br>3<br>3<br>4 | 6 | 1.8 | 70 | + | | | | |
| | | 6 | 11-13 | 3<br>4<br>3<br>4 | 7 | 2.0 | 34.9 | - | | | | |
| | 715 | 7 | 13-15 | 15<br>25<br>22<br>30 | 47 | 1.5 | 65.4 | - | | | | |
| 15 | | | | | | | | | SP | | Gray aplastic fine to coarse SAND, little Silt, moist, moderately dense to moderately loose. | Sand |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
+ = Positive Test Result
NA = Not Applicable/Not Available
Samples collected 1-3' and 5-7' bgs.

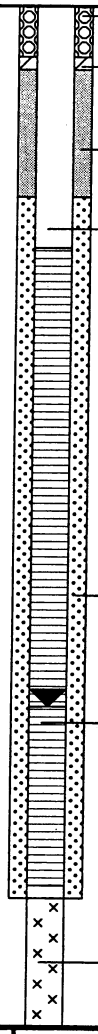
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/29/01 | 7.6' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/29/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 560137.69<br>**Easting:** 13305495.75<br>**Casing Elevation:** 728.2<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-09<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | | |
| 0 | | | | | | | | | FILL | | CONCRETE. | FILL |
| | | 1 | 0-2 | - 9 11 9 | 20 | 1.2 | 5.0 | - | ML | | Yellow-brown aplastic SILT, some fine to coarse subangular Sand, little fine to coarse subangular Gravel, trace Clay, dry, loose. | SILT |
| | | | | | | | | | | | Dark gray-brown aplastic SILT, little Clay and fine to medium subangular Sand, dry to damp, moderately dense to dense. | SILT |
| | 725 | 2 | 2-4 | 9 8 7 9 | 15 | 1.6 | 6.0 | - | | | Dark brown aplastic SILT, some fine to coarse subrounded to subangular SAND, little Clay, dry, moderatley dense to moderately loose. | SILT |
| | | | | | | | | | | | Yellow-brown aplastic SILT, some fine to coarse subangular Sand, little fine to coarse subangular Gravel, trace Clay, dry, loose. | SILT |
| 5 | | 3 | 4-6 | 6 7 8 9 | 15 | 1.3 | 4.6 | - | SP | | Light yellow-brown aplastic, quartz-rich fine to medium SAND, some Silt, trace Clay, moist, moderately dense to dense. | SAND |
| | | 4 | 6-8 | 6 6 9 11 | 15 | 1.5 | 10.0 | + | | | | SAND |
| | 720 | 5 | 8-10 | 4 8 8 11 | 16 | 1.5 | 432 | + | ML-C | | Gray-brown aplastic SILT, some Clay, hydrocarbon odor, saturated, dense, oily sheen. | SILT |
| 10 | | 6 | 10-12 | 12 15 15 13 | 30 | 1.5 | 1782 | + | | | Gray SILT and CLAY, little fine to medium Sand, hydrocarbon odor, oil, damp. very dense. | |
| | | | | | | | | | | | Brown aplastic SILT, little fine to medium Sand, some coarse angular Gravel, littel Clay, hydrocarbon odor, oily sheen, wet, moderately to very dense. | SILT |
| | 715 | 7 | 12-14 | 9 12 25 18 | 40 | 1.6 | 1679 | + | | | | SILT |
| 15 | | 8 | 14-16 | 4 9 11 15 | 20 | 1.4 | 39.3 | - | SP | | Gray aplastic fine to coarse SAND, little Silt and fine to coarse Gravel, slight hydrocarbon odor, saturated, loose. | SAND |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
+ = Positive Test Result
NA = Not Applicable/Not Available
Samples collected 0.7-2.7' and 4.7-6.7' bgs.

**Water Level Data**

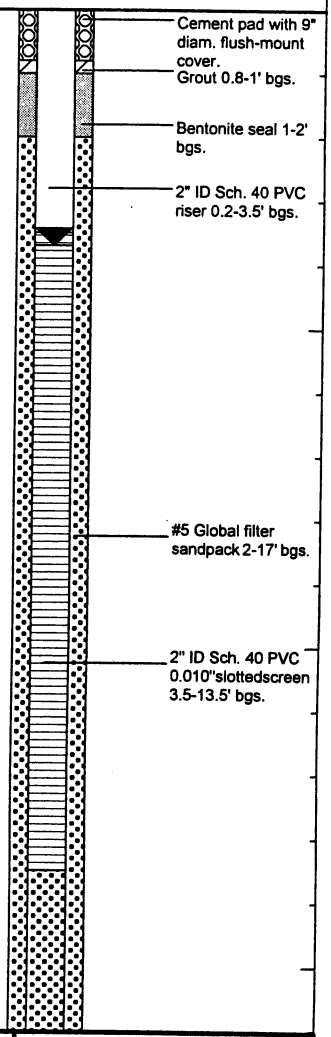
| Date | Depth | Elev. |
|---|---|---|
| 5/29/01 | 11.0' bgs | |

Project: 644.10.011 Template: j:\rockware\logplot2001\logfiles\64410\Auger_well2.ldf
Data File: RFI-09-09.dat Date: 8/6/01

| | | |
|---|---|---|
| **Date Start/Finish:** 5/29/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 559790.25<br>**Easting:** 13305453.37<br>**Casing Elevation:** 726.45<br><br>**Borehole Depth:** 26' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-10<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | - - | | | | | FL | | Concrete. | FILL |
| | 725 | 1 | 1-3 | 2 3 NA NA | 3 | 1.8 | 3487 | - | ML | | Black (10 YR 2/1) SILT. Some fine to medium (predominantly fine) Sand. Little Clay. Local increase in clay content to some. Aplastic, no odor, moderately dense, moist to wet. Fill | SILT |
| | | | | | | | | | | | Rubble and brick. Spoon refusal. | |
| | | 2 | 3-5 | 1 2 2 3 | 4 | 1.8 | 3841 | - | ML | | SILT as above (0.8-2.0' bgs) but brown (10 YR 5/3). Saturated. Decrease in Clay content to few after 3.7' bgs. | |
| 5 | | 3 | 5-7 | 1 3 5 7 | 8 | 2.0 | 152 | - | CL | | Grey (10 YR 5/1) SILTY CLAY. Little fine to medium subangular Sand. No odor, soft, moist but saturated with local increase in silt content to Silt. Clay Till. | CLAY |
| | 720 | | | | | | | | SP | | Brown (10 YR 5/3) fine to coarse (predominantly fine to medium) subangular SAND, some Silt, trace angular Gravel. Aplastic, no odor, saturated, loose. | SAND |
| | | 4 | 7-9 | 4 6 7 7 | 13 | 1.6 | 1621 | - | ML | | Brown (10 YR 5/3) SILT, little Clay. Aplastic, no odor, saturated, moderately dense. Turn to grey (10 YR 5/1) with brown mottling after 7.0' bgs and homogenous grey at 8.0' bgs. 3" thick Sand lens at 7.0' as described above (5.5'-6.5' bgs). Moist at 12.9' bgs instead of saturated. | SILT |
| 10 | | 5 | 9-11 | 4 4 5 7 | 9 | 1.6 | 3664 | - | | | | |
| | 715 | 6 | 11-13 | 4 6 3 7 | 9 | 1.4 | 4367 | - | | | | |
| | | 7 | 13-15 | 1 2 9 29 | 11 | NA | 1740 | - | | | | |
| 15 | | 8 | 15-17 | 22 26 | 54 | NA | 1972 | - | GP | | Grey (10 YR 5/1) fine to coarse subrounded to angular GRAVEL, some fine to coarse subangular Sand, little Silt, no odor, saturated, loose. Fines downward to a Silt. Glacial-alluvial. | GRAVEL |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
Sample collected 0.8-2' bgs.
NA = Not Available/Not Applicable

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/29/01 | 3.7' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-09-10

**Borehole Depth:** 26' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 710 | 8 | 15-17 | 29<br>27 | 54 | NA | 1972 | - | CL | | Gray (10 YR 5/1) CLAY, some Silt, little fine to medium subangular to subrounded Sand, few fine to medium subrounded Gravel. Hard , no odor, dry. Clay Till. | CLAY | #5 Global filter sandpack 2-17' bgs. |
| 20 | | | | | | | | | | | | | |
| | 705 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 700 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 695 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
Sample collected 0.8-2' bgs.
NA = Not Available/Not Applicable

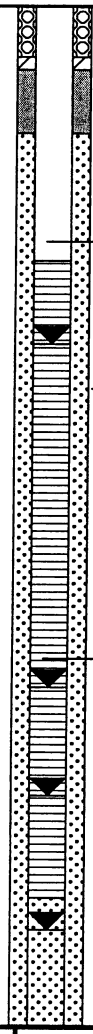
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/29/01 | 3.7' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/11/2001<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 560158.58<br>**Easting:** 13305417.44<br>**Casing Elevation:** 728.85<br><br>**Borehole Depth:** 24' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-11<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | | |
| 0 | | | | - | | | | | | | Concrete. | SAND |
| | | 1 | 0-2 | 8<br>3<br>3 | 11 | 1.2 | 0.0 | - | SP | | Gray brown (10YR 5/2) subangular to subrounded fine to coarse aplastic SAND, some Silt, some Clay, no odor, moderately dense, dry. | |
| | | | | | | | | | ML | | Yellow brown (10YR 5/4) aplastic SILT, some Clay, little fine subangular Sand, no odor, dense, damp. | SILT and CLAY |
| | | 2 | 2-4 | 2<br>4<br>4<br>5 | 8 | 1.6 | 0.0 | - | CL | | Brown (10YR 4/3) soft CLAY, some Silt, little fine to medium (predominantly fine) subangular Sand, no odor, damp, soft, locally oxidized, increased silt locally, black mottling at 2.7'-3.4' bgs. | |
| | 725 | | | | | | | | ML | | Brown (10YR 4/3) aplastic SILT, some fine to medium (predominantly fine) subriunded to subangular Sand, no odor, damp, moderately dense. | |
| 5 | | 3 | 4-6 | 2<br>2<br>4<br>3 | 6 | 2.0 | 17.6 | - | CL | | Gray (10YR 5/1) soft CLAY with yellow brown (10YR 5/4) mottling/oxidation, some Silt, little fine to medium subrounded to subangular Sand, few fine to coarse subrounded to subangular Gravel, oily (?), odor, soft, moist, 1"-3" silt lenses throughout, saturated at 5.3' bgs, becomes to brown (10YR 5/3) thoughout, oily, odor, damp. | |
| | | 4 | 6-8 | 2<br>2<br>8<br>12 | 10 | 2.0 | 27.4 | + | | | | |
| | 720 | 5 | 8-10 | 8<br>11<br>17<br>21 | 28 | 1.8 | 16.1 | + | | | | |
| 10 | | 6 | 10-12 | 5<br>12<br>17<br>22 | 29 | 1.8 | 25.2 | - | ML | | Yellow brown (10YR 5/2) aplastic SILT, some to little Clay, little fine fine subangular Sand, oily (?), odor, dense, damp, clay lenses upto 3" wide, saturated at 10.7' bgs, damp at 11.4' bgs, saturated at 12.4'-13.0' bgs, local reduction, blueish-gray mottling, damp, saturated again at 14.5' bgs, sand and gravel increased to little, clay decreased to little, grades to gray (10YR 6/1) fine to coarse subangular SAND and subangualr GRAVEL, saturated, odor (alluvial/river deposits). | |
| | | 7 | 12-14 | 9<br>16<br>20<br>22 | 36 | 2.0 | 9.9 | + | | | | |
| | 715 | | | | | | | | | | | |
| 15 | | 8 | 14-16 | 11<br>11<br>12<br>13 | 23 | 1.5 | 1.0 | – | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
+ = Positive Test Result
NA=Not Available/Not Applicable;
Soil samples collected from 0.5-2.5' and 2.5-4.5'.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/11/01 | 5.3 | |
| 6/11/01 | 10.7 | |
| 6/11/01 | 12.4 | |
| 6/11/01 | 14.5 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-09-11

**Borehole Depth:** 24' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 11 13 15 18 | 28 | 1.8 | 0.0 | - | ML | | Yellow brown (10YR 5/2) aplastic SILT, some to little Clay, little fine fine subangular Sand, oily (?), odor, dense, damp, clay lenses upto 3" wide, saturated at 10.7' bgs, damp at 11.4' bgs, saturated at 12.4'-13.0' bgs, local reduction, blueish-gray mottling, damp, saturated again at 14.5' bgs, sand and gravel increased to little, clay decreased to little, grades to gray (10YR 6/1) fine to coarse subangular SAND and subangualr GRAVEL, saturated, odor (alluvial/river deposits). | SILT and CLAY | |
| 710 | | 10 | 18-20 | 15 42 50/ 5" | 92 | 1.7 | 0.0 | - | SP | | Gray (10YR 5/1) fine to coarse subangular SAND, little to some fine to medium subrounded to subangular Gravel, little Silt, trace Clay, moderately dense, no odor to slight odor, saturated. | SAND | |
| 20 | | | | | | | | | CL | | Gray (10YR 5/1) CLAY, some Silt, little fine to medium subangular to subrounded Sand, few fine to coarse subrounded to rounded Gravel, no odor, dry, hard. | | Bentonite holeplug 16-24' bgs. |
| | | 11 | 20-22 | 15 17 28 33 | 45 | 1.6 | 0.0 | - | SC | | Alternating units of hard CLAY (as above) upto 8" wide and SAND (as 17.7-19.8) upto 3" wide, saturated, no odor, gravel lenses (10 YR 5/1, medium to coarse, subangular). | CLAY and SAND | |
| | | 12 | 22-24 | 40 50/ 5" - | NA | 1.1 | 0.3 | - | CL | | Hard CLAY as 19.8'-20.0' bgs. Clay Till. | CLAY | |
| 705 | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| 700 | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| 695 | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
+ = Positive Test Result
NA=Not Available/Not Applicable;
Soil samples collected from 0.5-2.5' and 2.5-4.5'.

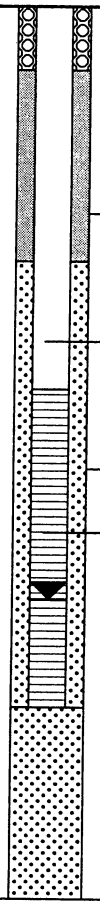
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/11/01 | 5.3 | |
| 6/11/01 | 10.7 | |
| 6/11/01 | 12.4 | |
| 6/11/01 | 14.5 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/11/2001<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:**<br>**Rig Type:** | **Northing:** 560112.01<br>**Easting:** 13305293.65<br>**Casing Elevation:** 729.77<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-12<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | | |
| 0 | | | | - | | | | | FL | | Concrete. | FILL |
| | | 1 | 0-2 | 8<br>7<br>7 | 15 | 1.1 | 0.0 | - | ML | | Dark yellow brown (10YR 4/6) SILT, mottled with very dark brown and black (10 YR 3/2 + 2/1) Silt, some Clay, some fine to coarse Sand, little subangular to subrounded Gravel, damp, no odor, moderately loose to moderately dense. | SILT |
| | | 2 | 2-4 | 3<br>4<br>4<br>5 | 8 | 1.6 | 0.0 | - | CL | | Light olive brown (10YR 5/3) Silty CLAY, some fine to coarse subangular Sand, few fine to medium subangular to subrounded Gravel, possible slag, locally oxidized, damp, moist to wet at 3.8' bgs, | CLAY |
| | 725 | | | | | | | | | | | |
| 5 | | 3 | 4-6 | 9<br>9<br>13<br>16 | 22 | 2.0 | 0.3 | - | FL | | Concrete. | FILL |
| | | 4 | 6-8 | 6<br>11<br>20<br>17 | 31 | 1.7 | 0.0 | - | CL | | Yellow brown (10YR 5/6) CLAY, some Silt, little fine to coarse subangular to subrounded Sand, trace subrounded Gravel, locally oxidized, dry, dense, no odor, color turns to gray (10YR 5/1) at 7.8' bgs. | CLAY |
| | 720 | 5 | 8-10 | 6<br>8<br>11<br>12 | 19 | 1.7 | 0.0 | - | | | | |
| 10 | | | | | | | | | SP | | Light brown gray fine to coarse subangular SAND, some Silt, no odor, moderately loose, saturated. | |
| | | | | | | | | | ML | | Gray (10YR 5/1) SILT, little fine subangular Sand, saturated, dense, no odor. | SILT |
| | | 6 | 10-12 | 15<br>40<br>50/5<br>- | 90 | 1.4 | 0.0 | - | CL | | Gray CLAY (stiff), trace fine to medium subangular Sand, some Silt, dry to damp. | CLAY |
| | | 7 | 12-14 | | - | - | - | | | | | |
| | 715 | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
PID background = 0.0 ppm
NA=Not Available
Samples collected 0.6-2.6 and 6-8' bgs.

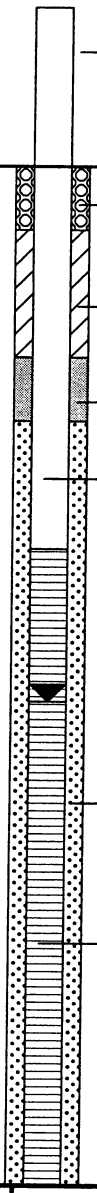
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/11/01 | 9.3 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/13/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 560089.51<br>**Easting:** 13305722.09<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 725.09<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-13<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 725 | 1 | 0-2 | 2 2 24 16 | 26 | 1.7 | 7.4 | - | ML | | Dark grayish brown (10 YR 4/2) SILT, little fine to coarse subrounded Sand, little Clay; aplastic, moderately dense, dry, earthy odor. Vegetation and roots present. Topsoil. | SILT |
| | | | | | | | | | FL | | Brick debris. | FILL |
| | | 2 | 2-4 | 10 10 14 15 | 24 | 1.8 | 9.9 | - | ML | | Brown (10 YR 4/3) SILT, some fine to coarse subangular to subrounded Sand, few Clay; aplastic, dry, dense, no odor. Concrete and brick debris present. Fill. | SILT |
| | | | | | | | | | SM | | Yellowish brown (10 YR 5/9) Silty SAND, fine to coarse subrounded to subangular Sand, few Clay, few fine subangular Gravel; dry, dense, no odor. Fill. | |
| 5 | 720 | 3 | 4-6 | 4 5 5 5 | 10 | 2.0 | 10.5 | - | CL | | Grayish brown (10 YR 5/1) with yellowish brown (10 YR 5/6) mottling and oxidation Silty CLAY, few fine to coarse subrounded Sand, stiff, weakly plastic, dry, no odor. Occasional silt lenses up to 3" thick throughout. Clay Till. | SILTY CLAY |
| | | 4 | 6-8 | 4 6 6 8 | 12 | 1.8 | 3.3 | - | | | Increasing moisture content to moist, especially in silt lenses. | |
| | | 5 | 8-10 | 2 3 5 6 | 8 | 2.0 | 5.0 | - | | | Saturated. | |
| 10 | 715 | 6 | 10-12 | 1 2 3 3 | 5 | 1.9 | 2.1 | - | | | | |
| | | 7 | 12-14 | 53 33 17 17 | 50 | 1.2 | 11.2 | - | | | | |
| 15 | 710 | 8 | 14-16 | 16 16 9 11 | 25 | 1.5 | 10.5 | - | SP | | Gray (10 YR 5/1) fine to coarse subrounded to subangular SAND, some fine to coarse subrounded Gravel (decreasing Gravel content with depth), few Silt (increasing Silt content with depth), few Clay (increasing Clay content with depth); moderately dense to dense, saturated, weak odor. Glacial-alluvial. | SAND |

**Boring Construction**



- Stick-up cover to 2.5' ags.
- Cement pad.
- Grout 1-3' bgs.
- Bentonite seal 3-4' bgs.
- 2" ID Sch. 40 PVC riser to 6' bgs.
- #5 global filter sandpack 4-18' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 6-16' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** a/bgs = above/below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2', 4-6' and 6-8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 09/13/01 | 8.4 bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-09-13

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 12 14 39 50/3" | 53 | 1.8 | 6.9 | - | CL | | Gray (10 YR 5/1) Silty CLAY, little fine to coarse subrounded Sand, trace fine to coarse rounded Gravel; hard, dry, weakly plastic, no odor. Clay Till. | SILTY CLAY | #5 global filter sandpack 4-18' bgs. |
| 20 | 705 | | | | | | | | | | | | |
| 25 | 700 | | | | | | | | | | | | |
| 30 | 695 | | | | | | | | | | | | |
| 35 | 690 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** a/bgs = above/below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2', 4-6' and 6-8' bgs.

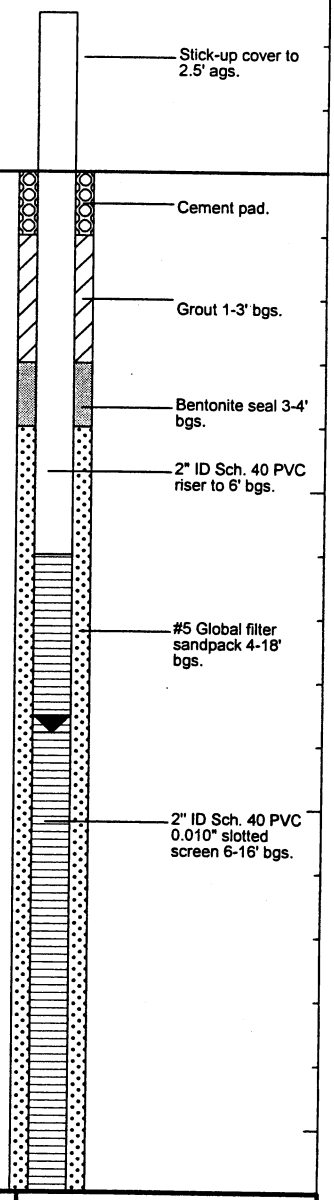
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 09/13/01 | 8.4 bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/13/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 559982.95<br>**Easting:** 13305726.37<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 724.44<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-14<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 725 | | | | | | | | | | |
| 0 | | 1 | 0-2 | 1 1 2 10 | 3 | 1.7 | 1.5 | - | ML | Dark grayish brown (10 YR 4/2) SILT, little fine to coarse subrounded Sand, little Clay; aplastic, moderately dense, dry, earthy odor. Vegetation and roots present. Topsoil. | SILT |
| | | 2 | 2-4 | 4 6 6 8 | 12 | 1.8 | 746 | - | SW | Yellowish-brown (10 YR 5/6) fine to medium subangular to subrounded SAND, little Silt, few Clay; aplastic, moderately dense, damp to dry, no odor. Concrete and brick debris and old root structure present, Little fine to coarse subrounded to subangular Gravel present at 2' bgs. At 3.2' bgs, very dark grayish brown (10 YR 3.2), increased density. | SAND |
| 5 | 720 | 3 | 4-6 | 2 5 5 4 | 10 | 2.0 | 289 | - | CL | Gray (10 YR 5/1) with brown (10 YR 5/3) mottling Silty CLAY, little fine to medium subangular to subrounded Sand; plastic, stiff to very stiff, dry to damp, moderate odor. Clay Till. | SILTY CLAY |
| | | 4 | 6-8 | 4 4 5 6 | 9 | 1.8 | 1.4 | - | | Increased moisture to moist to wet; occasional Silt lenses up to 3" thick throughout, especially from 7' bgs to lower contact. | |
| 10 | 715 | 5 | 8-10 | 2 3 5 10 | 8 | 2.0 | 2.1 | - | | Saturated. | |
| | | 6 | 10-12 | 9 10 13 14 | 23 | 1.9 | 0.0 | - | | | |
| | | 7 | 12-14 | 5 9 10 15 | 19 | 1.2 | 3.6 | - | SP | Gray (10 YR 5/1) fine to coarse subrounded to subangular SAND, some fine to medium subangular to subrounded Gravel, few Clay, little Silt; aplastic, moderately loose to increasingly dense with depth, no odor. Glacial-alluvial. | SAND |
| 15 | 710 | 8 | 14-16 | 9 9 13 24 | 22 | 1.5 | 0.9 | - | | | |
| | | | | | | | | | CL | Gray (10 YR 5/1) Silty CLAY. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** a/bgs = above/below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2', 2-4' and 6-8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 9/13/01 | 8.8' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-09-14

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 12<br>18<br>20<br>30 | 38 | 1.8 | 0.0 | - | CL | | Gray (10 YR 5/1) Silty CLAY, little fine to coarse subangular to subrounded Sand, trace fine to coarse subrounded to rounded Gravel; hard to weakly plastic, dry, no odor. | SILTY CLAY | #5 Global filter sandpack 4-18' bgs. |
| 20 | 705 | | | | | | | | | | | | |
| 25 | 700 | | | | | | | | | | | | |
| 30 | 695 | | | | | | | | | | | | |
| 35 | 690 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** a/bgs = above/below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2', 2-4' and 6-8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 9/13/01 | 8.8' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/04/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 559621.47<br>**Easting:** 13305499.89<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 3.9' bgs<br>**Surface Elevation:** 726.27<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-15<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 725 | 1 | 0-2 | 6<br>9<br>NA<br>NA | NA | 0.7 | 13.8 | + | ML | | Asphalt.<br>Very dark gray-brown to black (10 YR 2/1) SILT, little fine to coarse subangular Sand, few fine to medium rounded to subrounded Gravel, no odor, aplastic, dry, dense.<br>Concrete.<br>Very dark gray-brown SILT as at 0.5-1.5' bgs. Slag also present. Fill. Refusal encountered at 3.9'. | FILL<br>SILT<br>FILL<br>SILT | Borehole tremie grouted. |
| | | 2 | 2-3.9 | 7<br>8<br>NA<br>NA | NA | 1.0 | 12.5 | + | | | | | |
| 5 | 720 | | | | | | | | | | | | |
| 10 | 715 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result;
NA = Not Applicable/Not Available;
Samples collected 0.5-1.5 and 1.9-3.9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/04/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 559625.65<br>**Easting:** 13305521.07<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 3.5' bgs<br>**Surface Elevation:** 725.55<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-16<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 725 | | | | | | | | | | Asphalt. | FILL | |
| | | 1 | | 4 4 6 5 | 10 | 1.8 | 0.0 | - | ML | | Dark gray-brown to black (10 YR 2/1) SILT, little fine to medium subrounded to rounded Sand, little Clay, trace fine to coarse rounded to subrounded Gravel, no odor, aplastic, dense, damp. Fill | SILT | Borehole tremie grouted. |
| | | 2 | 2.5-3.5 | 3 3 | NA | 1.0 | 0.0 | - | | | | | |
| 5 | 720 | | | | | | | | | | | | |
| 10 | 715 | | | | | | | | | | | | |
| 15 | 710 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Sample collected 1-3' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/04/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 3.2' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-18<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | | | Asphalt. | | |
| | | 1 | 0.2-2.2 | 9<br>13<br>13<br>12 | 26 | 1.7 | 0.0 | - | ML | | Very dark gray-brown SILT, little fine to coarse angular to subangular Sand, little Clay, few fine to coarse subrounded Gravel, no odor, dense, aplastic, dry. | SILT | |
| | | 2 | 2.2-3.2 | 8<br>8 | NA | 0.5 | 0.0 | - | SM | | Yellow-brown (10 YR 5/6) Silty fine to medium poorly graded subangular SAND, little Clay, no odor, dense, dry. | SILTY SAND | Borehole tremie grouted. |
| 5 | 5 | | | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Sample collected 1-3' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

Project: 644.10.023 Template: j:\rockware\logplot2001\logfiles\64410\Auger_well.ldf
Data File:RFI-09-18.dat Date: 11/19/01

| | | |
|---|---|---|
| **Date Start/Finish:** 09/04/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 559447.28<br>**Easting:** 13305473.81<br>**Casing Elevation:** 726.11<br><br>**Borehole Depth:** 2.5' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-19<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | Asphalt. | FILL | |
| | 725 | 1 | 0.5-2.5 | 8<br>10<br>12<br>12 | 22 | 1.8 | 0.0 | - | ML-SM | | Very dark gray-brown SILT, little fine to coarse subangular Sand, few fine to medium subrounded Gravel, little Clay, no odor, dense, aplastic, dry. | SILT | Borehole tremie grouted. |
| | | | | | | | | | | | Yellow-brown (10 YR 5/6) Silty fine poorly graded subangular SAND, little Clay, no odor, dense, aplastic, damp. | | |
| 5 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Sample collected 0.5-2.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/04/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 559426.31<br>**Easting:** 13305469.68<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 2.5' bgs<br>**Surface Elevation:** 726.00<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-20<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | Asphalt. | | |
| | 725 | 1 | 0.5-2.5 | 6<br>8<br>8<br>10 | 16 | 1.6 | 0.0 | - | ML | | Very dark gray-brown SILT, little fine to coarse angular to subangular Sand, little Clay, trace fine to medium subangular Gravel, no odor, dense, aplastic, dry. Little fine to coarse black Sand with vitreous luster debris. | ← SILT → | Borehole tremie grouted. |
| 5 | 720 | | | | | | | | | | | | |
| 10 | 715 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Sample collected 0.5-2.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/04/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 559436.76<br>**Easting:** 13305461.00<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 2.5' bgs<br>**Surface Elevation:** 726.15<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-21<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | | | Asphalt. | | |
| | | 1 | 0.5-2.5 | 16<br>17<br>14<br>13 | 31 | 1.6 | 0.0 | - | ML-SM | | Very dark gray-brown SILT, little fine to coarse subangular Sand, little Clay, few fine to medium subrounded Gravel, no odor, dense, aplastic, dry. Brick debris also present - Fill. | SILT | Borehole tremie grouted. |
| | | | | | | | | | | | Yellow-brown (10 YR 5/6) Silty fine subangular SAND, little Clay, no odor, dense, aplastic, dry. | | |
| 5 | 5 | | | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Sample collected 0.5-2.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/04/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 559272.99<br>**Easting:** 13305437.78<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 4' bgs<br>**Surface Elevation:** 725.43<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-22<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 725 | 1 | 0-2 | 9<br>17<br>24<br>13 | 41 | 1.3 | 19.1 | - | ML | | Pale gray to gray (10 YR 6/1) SILT, some fine to coarse angular Sand, little fine to coarse angular Gravel, few Clay, no odor, dense, aplastic, dry. Fill and aggregate. | SILT | |
| | | 2 | 2-4 | 15<br>15<br>13<br>15 | 28 | 1.0 | 23.5 | - | SM | | Yellow-brown (10 YR 5/6) Silty fine to medium poorly graded subangular to subrounded SAND, little Clay, no odor, dense, aplastic, dry.<br><br>More oxidized, few fine to coarse subangular Gravel. Fill | SILTY SAND | Borehole tremie grouted. |
| 5 | 720 | | | | | | | | | | | | |
| 10 | 715 | | | | | | | | | | | | |
| 15 | 710 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Samples collected 0-2' and 2-4' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/04/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 559177.78<br>**Easting:** 13305404.71<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 4' bgs<br>**Surface Elevation:** 725.93<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-23<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 725 | 1 | 0-2 | 28<br>29<br>49<br>20 | 78 | 1.7 | 18.1 | - | ML | | Pale gray to gray (10 YR 6/1) SILT, some fine to coarse angular Sand, some fine to coarse angular Gravel, little Clay, no odor, dense, aplastic, dry. Fill and aggregate. | SILT | |
| | | 2 | 2-4 | 12<br>15<br>16<br>11 | 31 | 1.2 | 22.6 | + | | | Black (10 YR 2/1) SILT, some fine to medium subangular to subrounded Sand, little Clay, moderate "oily" odor, dense, aplastic, dry. Fill. | | Borehole tremie grouted. |
| 5 | 720 | | | | | | | | | | | | |
| 10 | 715 | | | | | | | | | | | | |
| 15 | 710 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; + = Positive Shake Test
NA = Not Applicable/Not Available.
Samples collected 0-2' and 2-4' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/04/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 559227.43<br>**Easting:** 13305409.17<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 4.0 ft.<br>**Surface Elevation:** 725.95<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-24<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | | | | | |
| | | 1 | 0-2 | 12<br>14<br>17<br>19 | 31 | 1.2 | 0.0 | - | ML | | Pale gray SILT, little Clay, little fine to coarse angular Sand, little to some fine to coarse angular Gravel, no odor, dense, aplastic, dry. Crushed and whole aggregate fill and concrete rubble.<br>Very dark brown SILT, little fine to medium subangular Sand, some Clay, no odor, dense, aplastic, dry. Glassy and metallic angular fine to coarse sand-sized debris present. Fill | SILT | Borehole tremie grouted. |
| | | 2 | 2-4 | 12<br>22<br>26<br>29 | 48 | 1.5 | 0.0 | - | SM | | Yellow-brown (10 YR 6/4) SILTY fine to medium poorly graded subangular SAND, little Clay, no odor, dense, aplastic, damp. Glacial-alluvial. at 3.5': 1" thick silt lenses present. | | |
| 5 | 5 | | | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Samples collected 0-2' and 2-4' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/04/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 559199.45<br>**Easting:** 13305374.93<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 4' bgs<br>**Surface Elevation:** 726.25<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-25<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 725 | 1 | 0-2 | 12<br>23<br>14<br>20 | 37 | 1.4 | 22.9 | - | ML | | Pale gray to gray (10 YR 6/1) SILT, some fine to coarse angular Sand, little to some fine to coarse angular Gravel, little Clay, no odor, dense, aplastic, dry. Fill and aggregate. | SILT | |
| | | | | | | | | | SP | | Reddish-brown fine to coarse angular well graded SAND, no odor, moderately loose, dry. Foundry sand. | SAND | |
| | | 2 | 2-4 | 23<br>24<br>19<br>14 | 43 | 1.0 | 27.6 | - | ML | | Black (10 YR 2/1) SILT, little fine to coarse angular foundry Sand, some Clay, occasional brick and glass shards, no odor, dense, aplastic, dry. | ← SILT → | Borehole tremie grouted. |
| | | | | | | | | | SM | | Yellow-brown Silty fine to medium poorly graded subangular SAND, little Clay, no odor, dense, aplastic, damp to dry. Glacial-alluvial. | | |
| 5 | 720 | | | | | | | | | | | | |
| 10 | 715 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samles collected 0-2' and 2-4' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/05/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 559772.46<br>**Easting:** 13305255.39<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 2.7' bgs<br>**Surface Elevation:** 730.72<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-26<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 730 | | | | | | | | FL | | Asphalt. | FILL | |
| | | | | | | | | | | | Concrete. | | |
| | | 1 | 0.7-2.7 | 2<br>4<br>4<br>3 | 8 | 1.6 | 0.0 | - | ML | | Dark yellow-brown (10 YR 4/6) SILT, some Clay, little fine to coarse subangular Sand; cement/concrete fragments, damp, moderately dense, aplastic, heavily oxidized, no odor. FILL | SILT | Bentonite (0.0 to 2.7' bgs) |
| | | | | | | | | | | | Yellow-brown (10 YR 5/6) SILT, little Clay, some fine to medium subangular to subrounded Sand; aplastic, no odor, moderately dense, damp. | | |
| 5 | 725 | | | | | | | | | | | | |
| 10 | 720 | | | | | | | | | | | | |
| 15 | 715 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Sample collected 0.7-2.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/04/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 559748.69<br>**Easting:** 13305282.44<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 3' bgs<br>**Surface Elevation:** 730.45<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-27<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 730 | | | | | | | | | | Asphalt. | FILL | |
| | | 1 | 0.7-2.7 | 7<br>13<br>14<br>14 | 27 | 1.0 | 7.9 | - | ML | | Dark brown SILT, little fine to coarse subangular Sand, few fine to medium subangular to angular Gravel, few Clay, no odor, moderately dense to dense, aplastic, dry. | SILT | Borehole tremie grouted. |
| 5 | 725 | | | | | | | | | | | | |
| 10 | 720 | | | | | | | | | | | | |
| 15 | 715 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Sample collected 0.7-2.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/05/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID HSA<br>**Rig Type:** CME 55 | **Northing:** 559722.39<br>**Easting:** 13305256.90<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 2.5' bgs<br>**Surface Elevation:** 730.90<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-28<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | Asphalt. | FILL | |
| | | 1 | 0.5-2.5 | 8 8 7 9 | 15 | 1.8 | 7.8 | + | ML | | Brown (10 YR 5/3) to yellow-brown (10 YR 5/6) SILT (ML), some Clay, little fine to coarse subangular to subrounded Sand, trace rounded fine Gravel; metallic ash and brick debris present, aplastic, damp, dense, no odor. Fill. | ← SILT → | Bentonite (0.0 to 2.5' bgs) |
| 5 | 5 | | | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0.5-2.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/05/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID HSA<br>**Rig Type:** CME 55 | **Northing:** 559749.14<br>**Easting:** 13305231.08<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 1.7' bgs<br>**Surface Elevation:** 732.62<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-09-29<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | Asphalt | | |
| | | 1 | 0-2 | 9<br>10<br>50/<br>4" | NA | 1.0 | 7.9 | - | ML | | Black (10 YR 2/1) SILT, little fine to coarse subrounded Sand, few Clay; aplastic, dry, moderately dense, no odor. Fill with metallic and brick debris. | SILT | Bentonite (0.0 to 2.5' bgs) |
| | | | | | | | | | | | Refusal. | | |
| 5 | 5 | | | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Sample collected 03.-1.7' bgs.

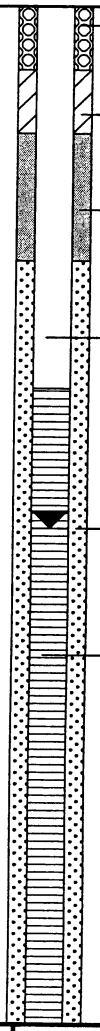
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/26/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4"<br>**Rig Type:** CME 55 | **Northing:** 566673.26<br>**Easting:** 13306446.66<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 749.11<br><br>**Descriptions By:** S Kerr | **Boring ID:** RFI-10-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 750 | | | | | | | | | | | |
| 0 | | | NA | NA | NA | NA | NA | NA | FILL | | Concrete. | Fill |
| | | 1 | 1-3 | 7 9 10 12 | 19 | 0.0 | 2.5 | - | ML | | Dark gray (10 YR 4/1) SILT, little fine to coarse Sand, little Clay, trace fine Gravel, aplastic, damp to moist, no odor, moderately loose. | SILT |
| | 745 | 2 | 3-5 | 5 6 7 6 | 13 | 1.4 | 2.2 | + | | | | |
| 5 | | 3 | 5-7 | 4 4 5 5 | 9 | 1.4 | 2.3 | + | | | | |
| | | 4 | 7-9 | 2 2 1 2 | 3 | 2.0 | 11.7 | + | | | Gray (10 YR 6/1) SILT, trace fine Sand, dense, moist, slight odor.<br>SILT, as at 1-7.3' bgs, increased Sand to some, fine to coarse Gravel, moist to wet,<br>at 8.2': Saturated, various color sand varves, olive brown, red, gray. | |
| | 740 | 5 | 9-11 | 2 2 2 3 | 4 | 1.3 | 4.2 | + | CL | | Light olive brown (10 YR 5/3) SILTY CLAY, trace fine Sand, saturated, no odor. | |
| 10 | | | | | | | | | ML | | SILT, as at 7.5-9.7' bgs.<br>Light olive brown (10 YR 5/3) SILT, trace fine Sand, moderately loose, saturated, no odor. Changes to gray (10 YR 4/1) at 10.9' bgs. | SILT |
| | | 6 | 11-13 | 2 4 6 7 | 10 | 1.7 | 2.5 | - | | | | |
| | | | | | | | | | SM | | Gray (10 YR 5/1) fine SAND, some Silt, moderately dense, saturated, no odor. | SAND |
| | 735 | 7 | 13-15 | 3 5 6 7 | 11 | 1.2 | 0.6 | - | | | | |
| 15 | | 8 | 15-17 | 2 4 | 9 | 1.5 | 0.0 | - | ML | | Gray (10 YR 5/1) SILT, trace fine Sand, dense, saturated, slight odor. | SILT |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Available; + = Positive Test Results;
Samples collected 1-3', 5-7' and 9-11' bgs.
A boring was previously installed at this location on 7/20/01.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/26/01 | 8.2' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-10-01

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 15-17 | 5<br>6 | 9 | 1.5 | 0.0 | - | ML | | Gray (10 YR 5/1) SILT, trace fine Sand, dense, saturated, slight odor. | SILT | Global #5 sandpack 4-17' bgs. |
| | 730 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Available; + = Positive Test Results;
Samples collected 1-3', 5-7' and 9-11' bgs.
A boring was previously installed at this location on 7/20/01.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/26/01 | 8.2' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/27/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 566361.12<br>**Easting:** 13306621.08<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 750.54<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | | | | | | | | FL | | Concrete. | FILL |
| | | 1 | 0.8-2.8 | 30 31 50/5 | 81 | 1.2 | 9553 | + | SP | | Ligth olive brown (2.5 Y 5/4) fine to medium SAND. Dry, dense, slight odor. | SAND and SILT |
| | | | | | | | | | | | Black (10 YR 2/1) SILT. Trace Clay. Little fine to medium Sand. Trace subrounded to subangular Gravel. Dry, dense, slight odor. | |
| | | 2 | 2.8-4.8 | 16 17 17 10 | 34 | 1.5 | >9999 | + | | | SAND as above (0.8'-2.0' bgs) with some fine to coarse Gravel, little Clay, concrete rubble. | |
| 5 | 745 | 3 | 4.8-6.8 | 9 6 6 5 | 12 | 1.5 | >9999 | + | ML | | Black (10 YR 2/1) SILT, trace Clay, little fine Sand. Dense, moist, slight odor. | |
| | | | | | | | | | CL | | Grey CLAY (10 YR 5/1) with black staining throughout. Some Silt. Little fine Sand. Stiff, slight odor, moist, low plasticity. | SILT |
| | | 4 | 6.8-8.8 | 5 6 8 10 | 14 | 1.3 | >9999 | - | | | Greyish brown (10 YR 5/2) SILT. Little Clay. Some fine Sand. Aplastic, moist, dense, slight odor. Wet with some oxidation at 8.8' bgs. | |
| 10 | 740 | 5 | 8.8-10 | 3 3 4 5 | 7 | 1.5 | >9999 | - | | | No more clay. | |
| | | | | | | | | | | | Decrease in sand content to trace and moderately dense. | |
| | | 6 | 10.8-12 | 1 1 1 4 | 2 | 1.2 | >9999 | - | ML | | | |
| | | 7 | 12.8-14 | 4 5 8 9 | 13 | 1.4 | >9999 | - | | | | |
| 15 | 735 | 8 | 14.8-16 | 3 6 6 | 12 | 1.3 | 299 | - | | | | |

**Boring Construction**

- Cement pad with flush-mount cover.
- Cement/bentonite grout 1.0-3.0' bgs.
- Bentonite chip seal 3.0-5.0' bgs.
- 2" ID PVC riser to 7.0' bgs.
- #5 Global sandpack 5.0-19.0' bgs.
- 2" ID PVC Sch. 40 0.010" slotted screen 7.0-17.0' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = non available
+ = Positive Test Result
Samples collected 0.8-2.8' and 6.8-8.8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/27/01 | 9.95' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-10-02

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 14.8-1 | 9 | 12 | 1.3 | 299 | - | ML | | SILT as above (6.4' -16' bgs). | SILT | 2" ID PVC Sch. 40 0.010" slotted screen 7.0-17.0' bgs. |
| | | 9 | 16.8-1 | 1<br>2<br>7<br>4 | 9 | 1.7 | 32.7 | - | CL | | Grey CLAY (10 YR 5/1) . 1/2" Silt seams. Soft. | CLAY | #5 Global sandpack 5.0-19.0' bgs. |
| 20 | 730 | | | | | | | | | | | | |
| 25 | 725 | | | | | | | | | | | | |
| 30 | 720 | | | | | | | | | | | | |
| 35 | 715 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = non available
+ = Positive Test Result
Samples collected 0.8-2.8' and 6.8-8.8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/27/01 | 9.95' | |

Project: 644.10.022 Template: j:\rockware\logplot2001\logfiles\64410\auger_well.ldf
Data File:RFI-10-02.dat Date: 9/14/01

| | | |
|---|---|---|
| **Date Start/Finish:** 6/27/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 566190.41<br>**Easting:** 13306666.7<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 751.79<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-10-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | FL | | Concrete. | FILL |
| | 750 | 1 | 0.6-2.6 | n/a n/a 2 3 | n/a | 0.7 | >9999 | - | CL | | Yellow brown (10 YR 5/6) CLAY with mottling (10 YR 6/1) . Trace fine to medium subangular Sand. Stiff, dry, no odor, At 5.0' bgs. Silt seams up to 3" thick, moist. pp= 3.5 | CLAY |
| | | 2 | 2.6-4.6 | 1 2 4 5 | 6 | 1.5 | >9999 | - | | | | |
| 5 | | 3 | 4.6-6.6 | 2 3 4 4 | 7 | 1.5 | >9999 | - | | | Yellow brown (10 YR 5/6) SILTY CLAY. Trace fine to medium subangular Sand. Moist, no odor, highly plastic. Local oxidation. | |
| | 745 | 4 | 6.6-8.6 | 4 4 5 5 | 9 | 1.6 | >9999 | - | ML | | Yellow brown (10 YR 5/6) SILT. Some fine subangular Sand. Moist, moderately loose. | SILT |
| 10 | | 5 | 8.6-10 | 2 2 2 2 | 4 | 1.4 | >9999 | - | SP | | Yellow brown (10 YR 5/6) predominantly fine to medium SAND. Some Silt. Loose, damp, no odor.<br><br>saturated. | SAND |
| | 740 | 6 | 10.6-1 | 1 WO WO 1 | n/a | 1.5 | >9999 | - | | | Become coarser at 12.2' bgs. | |
| | | 7 | 12.6-1 | 2 3 3 4 | 6 | 1.3 | >9999 | - | | | | |
| 15 | | 8 | 14.6-1 | 1 2 3 | 5 | 0.8 | >9999 | - | ML | | Gray (10 YR 5/1) SILT. Saturated, no odor, loose, aplastic. Glacial-alluvial. | SILT |

**Boring Construction**

- Cement pad with 9" flush-mount cover.
- Cement/bentonite grout 1-4' bgs.
- 2" ID PVC riser to 8' bgs.
- Bentonite chip seal 4-6' bgs.
- #5 Global filter pack sandpack 6-19' bgs.
- 2" ID PVC 0.010" slotted screen 8-18' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
WOH = Weight of Hammer.
NA = Not Applicable/Not Available
Samples collected 0.6-2.6' and 6.6-8.6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/27/01 | 9.6' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-10-03

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 14.6-1 | 4 | 5 | 0.8 | >9999 | - | ML | | Gray (10 YR 5/1) SILT. Saturated, no odor, loose, aplastic. Glacial-alluvial. | SILT | 2" ID PVC 0.010" slotted screen 8-18' bgs. |
| | 735 | | | 1 | | | | | | | | | |
| | | | | 2 | | | | | | | | | |
| | | 9 | 16.6-1 | 5 | 5 | 1.1 | >9999 | - | | | | | #5 Global filter pack sandpack 6-19' bgs. |
| | | | | 4 | | | | | | | | | |
| | | | | | | | | | CL | | Gray (10 YR 5/1) CLAY. Soft ( pp= 1.5), highly plastic, saturated, no odor. Glacial clay. | CLAY | |
| 20 | | | | | | | | | | | | | |
| | 730 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
WOH = Weight of Hammer.
NA = Not Applicable/Not Available
Samples collected 0.6-2.6' and 6.6-8.6' bgs.

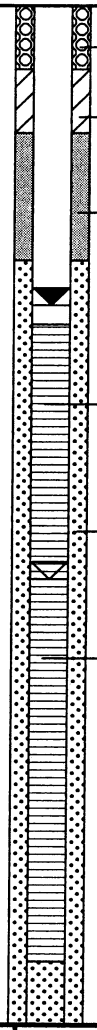
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/27/01 | 9.6' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/19/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 566212.9<br>**Easting:** 13306751.79<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 750.64<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-04<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | | NA | NA | NA | NA | NA | NA | FILL | | Brown (10 YR 4/3) fine to coarse subangular SAND, little to some Silt, some coarse Gravel to Cobble-size Fill, trace roots, loose, no odor, dry.<br>Black (10 YR 2/1), some Silt. | FILL |
| | | 1 | 3-5 | 1 2 3 4 | 5 | 1.8 | 792 | - | CL | | Yellow-brown (10 YR 5/6) Silty CLAY, little fine to medium Sand, trace fine to medium Gravel, moderately to medium stiff, no odor, dry to moist. Clay Till. | Silty CLAY |
| 5 | 745 | 2 | 5-7 | 2 2 3 5 | 5 | 0.8 | 4159 | - | ML | | Yellow-brown (10 YR 5/4) SILT, some fine subangular to subrounded Sand, aplastic, loose, no odor, moist. Saturated at 4.7' bgs. | SILT |
| | | 3 | 7-9 | 4 4 4 5 | 8 | 0.0 | NA | NA | SM | | Yellow-brown (10 YR 5/6) Silty fine subangular to subrounded SAND, aplastic, loose to moderately loose, no odor, moist. | SILTY SAND |
| 10 | 740 | 4 | 9-11 | 2 2 4 3 | 6 | 1.6 | 306 | - | | | Saturated. | |
| | | 5 | 11-13 | 1 1 1 1 | 2 | 1.7 | 1792 | - | | | | |
| | | 6 | 13-15 | 1 3 4 4 | 7 | 1.5 | 138 | - | | | Increased density with depth.<br>at 14.4': Heavily oxidized to lower contact. | |
| 15 | 735 | 7 | 15-17 | 2 3 | 6 | 1.7 | 327 | - | ML | | Gray (10 YR 6/1) SILT, trace fine subangular Sand, little Clay, aplastic, moderately dense, no odor, saturated. | SILT |

**Boring Construction**



- Cement pad with 9" diam. flush-mount cover.
- Cement/bentonite grout 1-2' bgs.
- Bentonite seal 2-4' bgs.
- 2" ID Sch. 40 PVC riser 0.2-5' bgs.
- #5 Global filter sandpack 4-17' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 5-15' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
WOH = Weight of Hammer.
NA = Not Applicable/Not Available
Sample collected 3-4.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/19/01 | 4.7', 9.0' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-10-04

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 7 | 15-17 | 3<br>4 | 6 | 1.7 | 327 | - | ML | | Gray (10 YR 6/1) SILT, trace fine subangular Sand, little Clay, aplastic, moderately dense, no odor, saturated. | SILT | #5 Global filter sandpack 4-17' bgs. |
| 20 | 730 | | | | | | | | | | | | |
| 25 | 725 | | | | | | | | | | | | |
| 30 | 720 | | | | | | | | | | | | |
| 35 | 715 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
WOH = Weight of Hammer.
NA = Not Applicable/Not Available
Sample collected 3-4.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/19/01 | 4.7', 9.0' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 08/27/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 566145.66<br>**Easting:** 13307019.13<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** 751.59<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-05<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 1 | 0-2 | 4 7 7 7 | 14 | 1.7 | 0.0 | - | ML | Dark grayish brown (10 YR 4/2) SILT, little to some fine to coarse rounded to subrounded Sand, little Clay; aplastic, dry, loose to moderately loose, no odor. Organic matter (roots and vegetation) present. | SILT |
| | 750 | 2 | 2-4 | 7 9 12 12 | 21 | 1.8 | 0.0 | - | CL | Brown (10 YR 5/3) Silty lean CLAY, few fine to coarse subrounded Sand, heavily oxidized, hard to very stiff, dry, no odor. Old root structures present, Paleo-Topsoil horizon. | SILTY CLAY |
| 5 | | 3 | 4-6 | 9 15 16 12 | 31 | 2.0 | 0.0 | - | ML | Brownish-yellow (10 YR 6/5) SILT, little Clay, trace fine rounded to subangular Sand; aplastic, dry, dense, no odor. Till. | SILT |
| | | | | | | | | | CL | Yellowish-brown (10 YR 6/8) Silty lean CLAY as at 0.5-3.6' bgs, but hard, friable, heavily oxidized. Till. | silty clay |
| | 745 | 4 | 6-8 | 3 4 3 3 | 7 | 1.8 | 0.0 | - | SM | Yellowish-brown (10 YR 5/8) Silty fine subrounded to subangular poorly graded SAND, dense to moderately dense, damp. Occasionally varved with darker varves of increased clay and silt content. Glacial-alluvial. | SILTY SAND |
| | | 5 | 8-10 | 2 3 5 5 | 8 | 2.0 | 0.0 | - | | | |
| 10 | | 6 | 10-12 | 2 2 3 2 | 5 | 1.9 | 0.0 | - | | Increased Clay content to few, decreasing density. | |
| | 740 | | | | | | | | | Increased moisture content to moist, yellowish-brown (10 YR 5/4) | |
| | | 7 | 12-14 | 1 1 1 1 | 2 | 1.2 | 0.0 | - | | Saturated, heavily oxidized to lower contact | |
| 15 | | 8 | 14-16 | 4 7 10 15 | 17 | 1.5 | 0.0 | - | | | |
| | | | | | | | | | ML | Gray (10 YR 5/1) SILT, little Clay; moderately dense, saturated, no odor. Glacial-alluvial. | SILT |

**Boring Construction**

- Portland Cement (0.0 - 1.0' bgs)
- Grout (1.0' - 3.0' bgs)
- Sch 40 2" PVC (0.0' - 9.9' bgs)
- Bentonite Seal (3.0' - 8.0' bgs)
- #5 Global Filler Sand Pack (8.0' - 20.0' bgs)
- Sch 40 Machined 0.010" Slot PVC Screen (9.9' - 19.9')

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2', 8-10' and 10-12' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/27/01 | 12.7' bgs | |

**Client:**
General Motors

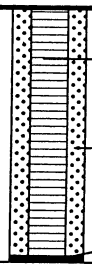
**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-10-05

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | 9 | 16-18 | 10 12 15 8 | 27 | 1.8 | 0.0 | - | ML | | Gray (10 YR 5/1) SILT, little Clay; moderately dense, aplastic, saturated, no odor. Glacial-alluvial. | SILT |
| | | 10 | 18-20 | 2 3 7 4 | 10 | NA | 0.0 | - | CL | | Gray (10 YR 5/1) Silty lean CLAY, soft to moderately stiff, moist, no odor. Glacial Clay. | |
| | | | | | | | | | ML | | Gray (10 YR 5/1) SILT as at 15.4-17.9' bgs, saturated. | SILT |
| 20 | | | | | | | | | CL | | Gray (10YR 5/1) Silty lean CLAY as at 17.9-18.6' bgs. | |
| | 730 | | | | | | | | | | | |
| 25 | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | |
| 30 | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | |
| 35 | | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2', 8-10' and 10-12' bgs.

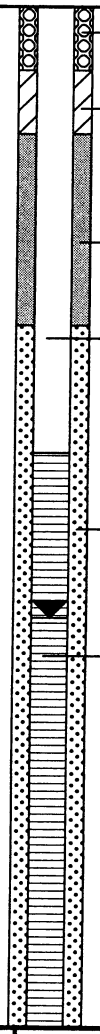
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/27/01 | 12.7' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/20/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 566532.11<br>**Easting:** 13306847.14<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 752.17<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-06<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | | |
| 0 | 750 | NA | 0-4 | NA | NA | NA | NA | NA | FILL | | Coarse angular gravel- to cobble-sized FILL, composed of granite, limestone, siltstone, and sandstone. | Fill |
| 5 | | 1 | 4-6 | 4 5 5 5 | 10 | 1.7 | 683 | - | CL | | Brown (10 YR 4/3) Silty CLAY, little fine subangular Sand, few fine rounded Gravel, medium stiff, moderate odor, damp to dry. Heavily oxidized and mottled to reddish-brown throughout. Clay Till. | silty clay |
| | | | | | | | | | SM | | Yellow-brown (10 YR 5/4) Silty fine subangular to subrounded SAND, aplastic, moderately loose to moderately dense, no odor, dry to damp. | |
| | | | | | | | | | CL | | Silty CLAY as above, but no odor. | |
| | 745 | 2 | 6-8 | 2 5 7 7 | 12 | 1.3 | 1299 | - | SM | | Silty SAND, as above, but brown-yellow (10 YR 6/6). | SILTY SAND |
| | | 3 | 8-10 | 3 5 5 6 | 10 | 2.0 | 113 | - | | | Moist. | |
| 10 | | 4 | 10-12 | 2 4 6 6 | 10 | 1.8 | 611 | - | | | Saturated. | |
| | 740 | 5 | 12-14 | 3 4 4 5 | 8 | 1.5 | 511 | - | | | Increasingly fine with depth, gray-brown (10 YR 5/2), with very dark gray varves, increased Clay to few. Glacial-alluvial. | |
| 15 | | 6 | 14-17 | 2 4 4 5 | 8 | 1.2 | 0.0 | - | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 4-6' and 6-8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/20/01 | 9.6' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-10-06

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 6 | 14-17 | NA | NA | 1.2 | 0.0 | - | SM | | Silty SAND, as above, but gray-brown (10 YR 5/2), with very dark gray varves, increased Clay to few, saturated. | silty sand | #5 Global filter sandpack 5-17' bgs. |
| | 735 | | | | | | | | | | | | 2" ID Sch. 40 PVC 0.010" slotted screen 7-17' bgs. |
| 20 | | | | | | | | | | | | | |
| | 730 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 4-6' and 6-8' bgs.

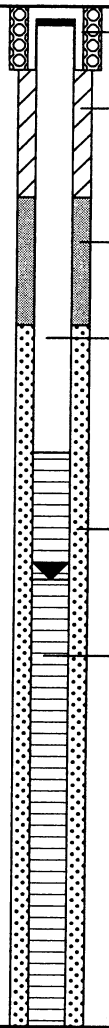
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/20/01 | 9.6' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/9/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 566450.04<br>**Easting:** 13306666.25<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 17' below grade<br>**Surface Elevation:** 751.33<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-07<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | NA | 0-1 | NA | NA | NA | NA | NA | | | CONCRETE. | FILL |
| | | 1 | 1-3 | 4<br>7<br>9<br>10 | 16 | 1.2 | 0.0 | - | FILL | | Black (10YR 2/1) Silty coarse to medium SAND, little Clay, FILL mixed with garbage, no odor, dense, dry. | SILTY SAND |
| | | 2 | 3-5 | 4<br>5<br>6<br>6 | 11 | 1.7 | 0.0 | - | | | Color change to yellow-brown (10YR 5/4) at 2.8' bgs. | |
| 5 | 5 | 3 | 5-7 | 1<br>2<br>1<br>1 | 3 | 1.3 | 0.0 | - | SM | | Occasional large Slag fragments, rumbly drilling to 5.0' bgs, damp. | |
| | | 4 | 7-9 | 1<br>1<br>1<br>1 | 2 | 1.6 | 0.0 | - | | | | |
| 10 | 10 | 5 | 9-11 | 3<br>5<br>7<br>6 | 12 | 1.3 | 0.0 | - | | | Dark brown (10YR 3/3), saturated at 9.0' bgs. | |
| | | 6 | 11-13 | 1<br>1<br>1<br>12 | 12 | 1.6 | 0.0 | - | | | | |
| | | 7 | 13-15 | 5<br>7<br>7<br>6 | 14 | 1.6 | 0.0 | - | | | | |
| 15 | 15 | 8 | 15-17 | 5<br>6 | 15 | 1.5 | 0.0 | - | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/19/01 | 9.0' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-10-07

**Borehole Depth:** 17' below grade

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 15-17 | 8<br>7 | 15 | 1.5 | 0.0 | - | SM | | Black (10YR 2/1) Silty coarse to medium SAND, little Clay, FILL mixed with garbage, no odor, dense, dry. | | #5 Global filter sandpack 5-17' bgs<br>2" ID Sch. 40 PVC 0.010" slotted screen 7-17' bgs |
| 20 | 20 | | | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.

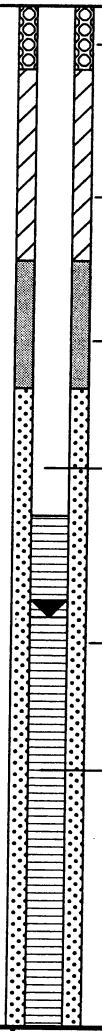
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/19/01 | 9.0' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/28/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 566531.77<br>**Easting:** 13306575.36<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 750.79<br><br>**Descriptions By:** SC Kerr | **Boring ID:** RFI-10-08<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | | | N/A<br>N/A | N/A | N/A | | | ML | | Dark grayish brown (10YR 4/2) SILT, little fine to coarse Sand, trace Clay, trace fine to coarse subangular Gravel, roots/plants, damp, loose. | SILT |
| | | 1 | 1-3 | 8<br>14<br>26<br>15 | 40 | 1.6 | 1491 | - | SP<br>ML | | Dark brown (10YR 3/3) fine to coarse SAND, some Silt, trace fine to medium subangular Gravel, dry, loose, no odor.<br>Yellow brown (10YR 5/4) SILT, some Clay, little fine Sand, moist, dense, no odor. | SAND |
| | | 2 | 3-5 | 7<br>12<br>15<br>14 | 27 | 1.0 | 601 | - | SP | | Yellow brown (10YR 5/4) fine to predominantly coarse SAND, some Silt, little fine to medium subangular to subrounded Gravel and Clay, dry, no odor. | |
| 5 | 745 | 3 | 5-7 | 2<br>4<br>3<br>- | 7 | 1.4 | 1015 | - | ML<br>CL | | Yellow brown (10YR 5/6) SILT, some fine to medium Sand, moist, dense, no odor.<br>Gray (10YR 5/1) Silty CLAY, few fine Sand, moist, soft, low palstic, no odor. | SILT and CLAY |
| | | 4 | 7-9 | 2<br>2<br>4<br>4 | 6 | 1.6 | 226 | - | SM | | Grayish brown (2SY 5/2) fine to coarse subangular Silty SAND, trace subangular to subrounded Gravel, little Clay, moist to wet at 8.5' bgs, no odor. | SILTY SAND |
| 10 | 740 | 5 | 9-11 | 2<br>1<br>2<br>3 | 3 | 1.4 | 1071 | - | ML | | Light brownish gray (10YR 6/2) SILT, some fine Sand, saturated, moderately dense, loose at 12' bgs, changes to gray (10YR 5/1) at 14.2' bgs. | SILT |
| | | 6 | 11-13 | 2<br>3<br>3<br>4 | 6 | 1.0 | 351 | - | | | | |
| | | 7 | 13-15 | 2<br>3<br>4<br>5 | 7 | 1.2 | 155 | - | | | | |
| 15 | 735 | 8 | 15-17 | 4<br>3 | 6 | 1.8 | 128 | - | | | | |

**Boring Construction**



- Cement pad with 9" diam. flush-mount cover.
- Grout 1-4' bgs.
- Bentonite seal 4-6' bgs.
- 2" ID Sch. 40 PVC riser to 8' bgs.
- #5 Global filter sandpack 6-19' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 8-18' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2' and 6-8', Sampled 0-1' from auger.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/28/01 | 9.6' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-10-08

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 15-17 | 3 4 | 6 | 1.8 | 128 | - | ML | | Light brownish gray (10YR 6/2) SILT, some fine Sand, saturated, moderately dense, loose at 12' bgs, changes to gray (10YR 5/1) at 14.2' bgs. | SILT | #5 Global filter sandpack 6-19' bgs. 2" ID Sch. 40 PVC 0.010" slotted screen 8-18' bgs. |
| | | 9 | 17-19 | 4 4 4 4 | 8 | 1.2 | 81.6 | - | | | | | |
| 20 | 730 | | | | | | | | | | | | |
| 25 | 725 | | | | | | | | | | | | |
| 30 | 720 | | | | | | | | | | | | |
| 35 | 715 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2' and 6-8', Sampled 0-1' from auger.

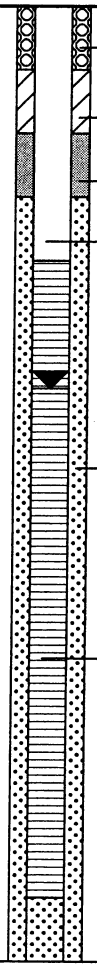
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/28/01 | 9.6' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/19/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 565770.49<br>**Easting:** 13306696.85<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 15' bgs<br>**Surface Elevation:** 746.14<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-11<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | NA | NA | NA | NA | NA | NA | FILL | | Coarse angular Gravel to Pebble/Cobble-sized FILL, trace Silt and roots. (Topsoil) | FILL |
| 5 | 740 | 1 | 3-5 | 4 5 6 7 | 11 | 1.6 | 1279 | - | SM | | Light yellow-brown (10 YR 6/4) Silty fine subangular SAND, moderately dense, no odor, dry to damp. | SILTY SAND |
| | | 2 | 5-7 | 3 5 5 8 | 10 | 1.8 | 589 | - | | | Yellow-brown (10 YR 5/6), wet. | |
| | | 3 | 7-9 | 5 5 5 5 | 10 | 1.8 | 457 | - | | | | |
| 10 | 735 | 4 | 9-11 | woh 1 1 1 | 2 | 1.6 | 664 | - | | | loose | |
| | | 5 | 11-13 | 1 2 3 5 | 5 | 1.9 | >9999 | - | | | at 12.2': Heavily oxidized to reddish-brown, fine to medium subangular Sand, increased coarseness downward. | |
| | | | | | | | | | ML | | Gray (10 YR 6/1) SILT, trace to little fine subangular Sand, little Clay, aplastic, moderately loose, no odor, wet. Denser with depth. | SILT |
| 15 | | 6 | 13-15 | 2 4 4 5 | 8 | 2.0 | >9999 | - | CL | | Gray (10 YR 6/1) Silty CLAY, trace fine subangular to subrounded Sand, trace fine Gravel, moderately stiff, no odor, moist. Glacial clay till. | SILTY CLAY |

**Boring Construction**



- Cement pad with 9" diam flush-mount cover.
- Cement/bentonite grout 1-2' bgs.
- Bentonite chip seal 2-3' bgs.
- 2" ID Sch. 40 PVC riser 0.2-4' bgs.
- #5 Global filter sandpack 3-15' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 4-14' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
WOH = Weight of Hammer.
NA = Not Applicable/Not Available
Sample collected 3-5' bgs.

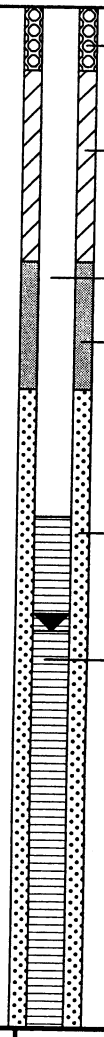
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/19/01 | 6.0' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/27/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 566365.98<br>**Easting:** 13306551.84<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 750.35<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-10-12<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | | | | | | | | FL | | Concrete. | FILL |
| | | 1 | 0.8-2.8 | 2 3 5 7 | 8 | 1.5 | >9999 | - | SP | | Brown (10 YR 5/3) fine SAND, some Silt and Clay, trace subangular to subrounded coarse Gravel, aplastic, loose, dry. | SAND |
| | | 2 | 2.8-4.8 | 7 7 5 5 | 12 | 1.5 | >9999 | - | ML | | Black ( 10 YR 2/1) SILT, little Clay, some fine to coarse Sand, concrete rubbles and slag, aplastic, loose, dry, slight odor, dense a t 4.0'-4.6' bgs and damp at 4.4' bgs. FILL. | SILT |
| 5 | 745 | 3 | 4.8-6.8 | 2 3 3 4 | 6 | 1.4 | >9999 | - | ML | | Dark gray ( 10 YR 4/1) SILT, little Clay and fine Sand, trace fine to medium Gravel, dense, aplastic, slight odor, damp. No more Clay at 5.3' bgs and moist to wet at 6.0' bgs. | SILT |
| | | 4 | 6.8-8.8 | 3 3 4 4 | 7 | 1.6 | >9999 | + | | | | |
| 10 | 740 | 5 | 8.8-10. | 1 2 2 1 | 4 | 1.7 | >9999 | + | SP | | Dark gray ( 10 YR 4/1) fine to medium SAND, loose, strong odor, wet, some black stains. | SAND |
| | | 6 | 10.8-12 | NA NA NA 1 | NA | 1.3 | >9999 | + | | | | |
| | | 7 | 12.8-14 | 1 1 2 1 | 3 | 1.5 | >9999 | + | ML | | Greyish brown (10 YR 5/2 ) SILT, some fine Sand, moderately loose, saturated, slight odor, some black staining. Visible sheen in water. | SILT |
| 15 | 735 | 8 | 14.8-16 | 3 3 | 7 | n/a | >9999 | - | | | Gray ( 10 YR 5/2) SILT, little Clay, trace fine Sand, saturated, no odor, moderately dense. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
+ = Positive Test Result
NA = Not Applicable/Not Available

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/27/01 | 9.8' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-10-12

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 14.8-16 | 4<br>6 | 7 | n/a | >9999 | - | ML | | Gray ( 10 YR 5/2) SILT, little Clay, trace fine Sand, saturated, no odor, moderately dense. | SILT | 2" ID PVC 0.010" slotted screen 8' - 18' bgs. |
| | | 9 | 16.8-18 | 3<br>4<br>5<br>5 | 7 | n/a | >9999 | - | | | | | #5 Glocal filter pack sandpack 6.0-18.0' bgs. |
| | | | | | | | | | CL | | Gray (10 YR 5/1) CLAY, little Silt, soft. | CLA | |
| 20 | 730 | | | | | | | | | | | | |
| 25 | 725 | | | | | | | | | | | | |
| 30 | 720 | | | | | | | | | | | | |
| 35 | 715 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
+ = Positive Test Result
NA = Not Applicable/Not Available

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/27/01 | 9.8' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/24/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Alan Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:**<br>**Rig Type:** Geoprobe | **Northing:** 566239.95<br>**Easting:** 13306551.65<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** 753.01<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-10-13<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | |
| 0 | | | | | | | FILL | | CONCRETE. | | |
| | | 1 | 0-2 | 1.3 | 3.2 | NA | SP | | Brown (10 YR 5/3) fine SAND, some Clay, little Silt, trace coarse Gravel, moderately dense, no odor, moist. FILL. | FILL | |
| | | | | | | | ML | | Dark gray (10 YR 4/1) SILT, some fine Sand, trace Clay, no odor, damp. | SAND | Borehole backfilled with bentonite to grade. |
| | 750 | 2 | 2-4 | 1.1 | 4.8 | NA | CL | | Grayish-brown (10 YR 5/2) Silty CLAY, some fine to medium Sand, trace coarse Gravel, local oxidation, stiff, no odor, dry. | SILTY CLAY | |
| 5 | | 3 | 4-6 | .4 | 3.1 | NA | | | Becomes soft, decreased Silt. | | |
| | | 4 | 6-8 | 2.0 | 3.1 | NA | ML | | Yellow-brown (10 YR 5/8) SILT, little fine Sand, moderately dense, damp. | SILT | |
| | 745 | | | | | | | | Increased fine Sand. | | |
| | | 5 | 8-10 | 1.8 | 6.5 | NA | | | Moist. | | |
| 10 | | | | | | | | | Wet. | | |
| | | 6 | 10-12 | 1.2 | 0.4 | NA | SP | | Yellow-brown (10 YR 5/6) fine to medium SAND, little Silt, moderately loose, saturated. | SAND | |
| | 740 | 7 | 12-14 | 1.5 | 0.0 | NA | | | Becomes dark gray (10 YR 4/1). Glacial-alluvial. | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.7-2.7' and 8.7-10.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/24/01 | 10.8' bgs | |

Project: 64410.022 Template: j:\rockware\logplot2001\logfiles\64410\Geoprobe.ldf
Data File:RFI-10-13.dat
Date: 8/30/01

| | | |
|---|---|---|
| **Date Start/Finish:** 6/27/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 566265.33<br>**Easting:** 13306671.3<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 751.94<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-10-14<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | | | |
| | | 1 | 0.9-2.9 | 9<br>14<br>26<br>11 | 40 | 1.5 | >9999 | + | FL | | Concrete. | FILL | |
| | 750 | | | | | | | | ML | | Black (10 YR 2/1) SILT, some fine to coarse Sand, little Clay, dry, dense, slight indeterminate odor. Fill. | SILT | Borehole backfilled with Bentonite Chips to grade. |
| | | 2 | 2.9-4.9 | 8<br>10<br>12<br>16 | 22 | 1.5 | >9999 | - | CL | | Grayish brown (10 YR 5/2) CLAY, little Silt and fine to coarse subangular to subrounded Sand, hard, stiff, dry, slight odor. Turns yellow brown (10 YR 5/6) at 3.6' bgs. Clay Till. | CLAY | |
| 5 | | 3 | 4.9-6.9 | 4<br>4<br>4<br>4 | 8 | 1.4 | >9999 | - | | | Yellow brown (10 YR 5/6) SILTY CLAY, trace fine to medium Sand and subangular Gravel, dense, moist, no odor, low plasticity, local oxidation. Clay Till. | | |
| | | | | | | | | | ML | | Yellow brown (10 YR 5/6) SILT, some fine Sand, moderately loose, moist, no odor. | | |
| | 745 | 4 | 6.9-8.9 | 6<br>5<br>4<br>4 | 9 | 1.3 | >9999 | - | SP | | Yellow brown (10 YR 5/6) fine to medium SAND, some Silt, aplastic, loose, damp, no odor. Wet at 8.3' bgs. Fill. | SAND | |
| | | 5 | 8.9-10 | 5<br>3<br>1<br>1 | 4 | 1.5 | >9999 | - | | | Some oxidation | | |
| 10 | | | | | | | | | ML | | Yellow brown (10 YR 5/4) SILT, some fine Sand, moderately loose, aplastic, saturated, no odor. | SILT | |
| | | 6 | 10.9-12 | n/a<br>n/a | n/a | 1. | >9999 | - | | | | | |
| | 740 | 7 | 12.9-14 | 1<br>n/a<br>n/a<br>1 | n/a | 1.2 | >9999 | - | SP | | Yellow brown (10 YR 5/4) predominantly fine to medium SAND, some Silt, moderately loose, aplastic, saturated, no odor, increase in Silt content to Silty Sand at 16.7' bgs, some oxidation present at 18.3-18.5' bgs. | SAND | |
| 15 | | 8 | 14.9-16 | n/a<br>1<br>3 | 1 | 1.4 | >9999 | - | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
+ = Positive Test Result
NA = Not Applicable/Not Available
Samples collected 0.9-2.9' and 6.9-8.9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/27/01 | 9.4' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-10-14

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | 9 | | 4 4 6 8 | 10 | 1.5 | >9999 | - | SP | | Yellow brown predominantly fine to medium SAND, some Silt, moderately loose, aplastic, saturated, no odor, increase in Silt content to Silty Sand at 16.7' bgs, some oxidation present at 18.5-19.0'. | SAND | Borehole backfilled with Bentonite Chips to grade. |
| | | | | | | | | | CL | | Gray (10 YR 5/1) CLAY, some Silt, soft, saturated, highly plastic, no odor. | | |
| 20 | | | | | | | | | | | | | |
| | 730 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
+ = Positive Test Result
NA = Not Applicable/Not Available
Samples collected 0.9-2.9' and 6.9-8.9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/27/01 | 9.4' bgs | |

Project: 644.10.011 Template: j:\rockware\logplot2001\logfiles\64410\Auger_well.ldf
Data File:RFI-10-14.dat Date: 07/09/01

| | | |
|---|---|---|
| **Date Start/Finish:** 08/27/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 566373.2<br>**Easting:** 13307055.55<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 751.25<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-15<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | | |
| | 750 | 1 | 0-2 | 4 8 9 8 | 17 | 2.0 | 0.0 | - | ML | | Dark grayish-brown (10 YR 4/2) SILT, little to some fine to coarse rounded to subrounded Sand, little to some Clay; aplastic, loose to medium loose, no odor. Organic matter present such as roots and vegetation. Topsoil | SILT |
| | | 2 | 2-4 | 7 9 8 8 | 17 | 2.8 | 0.0 | - | CL | | Brown (10 YR 5/3) Silty lean CLAY, few fine to coarse subrounded Sand, friable to very stiff, dry, heavily oxidized silt lenses up to 1" wide throughout, no odor. Old root structures present. Paleo-topsoil horizon. | SILTY CLAY |
| 5 | | 3 | 4-6 | 6 3 4 4 | 7 | 2.0 | 0.0 | - | ML | | Brownish-yellow (10 YR 6/8) SILT, little Clay, trace fine subangular Sand, aplastic, dry to damp, dense to moderately dense, no odor. Local patches of increased Clay content. Weathered and oxidized Glacial till. | SILT |
| | 745 | 4 | 6-8 | 2 3 3 3 | 6 | 2.0 | 0.0 | - | SM | | Yellowish brown (10 YR 6/8) Silty fine subangular to subrounded poorly graded SAND, few to little Clay, moderately loose, damp, no odor. Glacial-alluvial. | SILTY SAND |
| 10 | | 5 | 8-10 | 2 1 2 2 | 3 | 2.0 | 0.0 | - | | | Moist.<br>Wet, dark yellow-brown (10 YR 4/6). | |
| | 740 | 6 | 10-12 | 2 4 5 7 | 9 | 1.7 | 0.0 | - | | | Saturated.<br>Yellow-brown (10 YR 5/6) | |
| | | 7 | 12-14 | 4 6 8 7 | 14 | 1.7 | 0.0 | - | | | Heavily oxidized throughout to lower contact. | |
| 15 | | 8 | 14-16 | 6 5 3 2 | 8 | 2.0 | 0.0 | - | ML | | Gray (10 YR 5/1) SILT, little fine subangular to subrounded Sand (predominantly close to upper contact to 14.6' bgs), some to little Clay, aplastic, saturated, dense, no odor. Glacial-alluvial. | SILT |

**Boring Construction**

- Portland Cement 0-1' bgs
- Grout 1-3' bgs
- Bentonite Seal 3-6' bgs
- 2" Sch 40 PVC Riser 0-7.9' bgs
- #5 Global Filter Sand Pack 6-18' bgs
- Sch 40 machined PVC 0.010" Slot Screen 7.9-17.9' bgs

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2' and 8-10' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/27/01 | 10.5' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-10-15

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | 9 | 16-18 | NA | NA | NA | NA | NA | ML | | Gray (10 YR 5/1) SILT, little fine subangular to subrounded Sand (predominantly close to upper contact to 14.6' bgs), some to little Clay, aplastic, saturated, dense, no odor. Glacial-alluvial. | SILT | Sch 40 machined PVC 0.010" Slot Screen 7.9-17.9' bgs; #5 Global Filter Sand Pack 6-18' bgs; PVC Cap |
| 20 | 730 | | | | | | | | | | | | |
| 25 | 725 | | | | | | | | | | | | |
| 30 | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2' and 8-10' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/27/01 | 10.5' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/11/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** Skid Rig CME 45 | **Northing:** 566698.4<br>**Easting:** 13306445.19<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 6' bgs<br>**Surface Elevation:** 749.38<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-16<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 750 | | | | | | | | | | | | |
| 0 | | | NA | NA | NA | NA | NA | NA | FL | | CONCRETE. | FILL | |
| | | 1 | 2-4 | 5<br>7<br>7<br>5 | 14 | 1.1 | NA | NA | SM | | Black 10YR 2/1 Silty SAND (SM), poorly graded, fine to medium grained, subangular Sand, predominantly fine grained, few Clay, no odor, dense, aplastic, damp. Wood debris at the top 3" of upper contact. Fill. | SILTY SAND | Borehole backfilled with bentonite to grade. |
| | 745 | | | 8 | | | | | | | Gray (10YR 5/1). | | |
| 5 | | 2 | 4-6 | 6<br>9<br>10 | 15 | 2.0 | NA | NA | | | Black (10YR 2/1) to 5.5' bgs. Fill/Foundry Sand. | | |
| | | | | | | | | | ML | | Yellow-brown 10YR 5/4 SILT (ML), some fine subangular Sand, few Clay, no odor, dense, aplastic, damp. Fill. | SILT | |
| | | | | | | | | | | | Borehole terminated at 6'. | | |
| | 740 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |
| | 735 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 1.9-3.9' and 3.9-5.9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/30/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID SS<br>**Rig Type:** CME 55 | **Northing:** 566671.73<br>**Easting:** 13306423.07<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 5' bgs<br>**Surface Elevation:** 749.64<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-17<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 750 | | | | | | | | | | | | |
| 0 | | | | | | | | | FL | | Concrete. | FILL | |
| | | 1 | 1-3 | 10<br>14<br>17<br>17 | 31 | 1.3 | NA | NA | ML | | Dark brown (10YR 3/3) to brown (10YR 5/3) SILT, little fine to medium subangular Sand, little Clay, no odor, dense, aplastic, dry.<br>1.2' - 2.8': Thick lens of wood debris. Becomes lighter in color with less Sand. | SILT | Borehole backfilled with bentonite to grade. |
| | | 2 | 3-5 | 7<br>9<br>14<br>14 | 23 | 1.7 | NA | NA | SM | | Black (10YR 2/1) fine subangular Silty SAND, little Clay, poorly graded, no odor, dense, aplastic, dry. Fill-Foundry Sand. | Silty SAND | |
| | 745 | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |
| | 740 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |
| | 735 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3' and 3-5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/30/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 566674.4<br>**Easting:** 13306469.01<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 5.5' bgs<br>**Surface Elevation:** 750.08<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-18<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | | | | | | | | FL | | Concrete. | FILL | |
| | | 1 | 1.3-3.3 | 7<br>8<br>9<br>13 | 17 | 1.3 | 3.4 | + | ML | | Dark gray (10YR 4/1) SILT, little fine subangular Sand, little Clay, moderate odor, dense, aplastic, dry. Fill. | SILT | Borehole backfilled with bentonite to grade. |
| | | 2 | 3.3-5.5 | 4<br>10<br>11<br>12 | 21 | 1.8 | 6.6 | + | | | Becomes varied with light gray (10YR 7/1) lenses, strong to moderate odor. | | |
| 5 | 745 | | | | | | | | | | | | |
| 10 | 740 | | | | | | | | | | | | |
| 15 | 735 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
+ = Positive Test Result.
Samples collected1.3-3.3' and 3.3-5.3' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

Project: 64410.039 Template: j:\rockware\logplot2001\logfiles\64410\Auger_well.ldf
Data File:RFI-10-18.dat Date: 1/16/02

| | | |
|---|---|---|
| **Date Start/Finish:** 11/29/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 566649.14<br>**Easting:** 13306448.13<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 6' bgs<br>**Surface Elevation:** 750.12<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-19<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | | | | | | | | | | CONCRETE. | | |
| | | | | | | | | | FL | | PVC and CONCRETE debris. Old conduit? No water, odor present. Attempted spoon - no recovery. | FILL | |
| | | 1 | 2-4 | 2<br>4<br>6<br>6 | 10 | 1.5 | NA | NA | SM | | Brown (10YR 4/3) with black (10YR 2/1) and yellow-brown (10YR 5/4) oxidation fine to medium angular to subangular Silty SAND, little fine angular Gravel, few Clay, well graded, no odor, dense, aplastic, dry. Foundry Sand and Slag. | SILTY SAND | Borehole backfilled with bentonite to grade. |
| 5 | 745 | 2 | 4-6 | 7<br>9<br>7<br>10 | 16 | 1.6 | NA | NA | | | | | |
| | | | | | | | | | FL<br>SM | | Old weathered CONCRETE.<br>Very dark brown (10YR) fine to medium angular to subangular Silty SAND, little fine angular Gravel, few Clay, well graded, no odor, dense, aplastic, dry. Fill, Slag, and Foundry Sand. | | |
| 10 | 740 | | | | | | | | | | | | |
| 15 | 735 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 2-4' and 4-6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/29/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID SS<br>**Rig Type:** CME 55 | **Northing:** 566550.56<br>**Easting:** 13306574.29<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 2' bgs<br>**Surface Elevation:** 750.21<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-20<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | 1 | 0-2 | 2<br>2<br>3<br>4 | 5 | 1.6 | NA | NA | ML | | Black (10YR 3/1) SILT, little fine subangular yellow-brown (10YR 5/4) Sand in patches, some to little Clay, no odor, moderately dense, aplastic. Vegetation and plant roots throughout first foot (topsoil). Topsoil above Fill. | ← SILT → | Borehole backfilled with bentonite to grade. |
| 5 | 745 | | | | | | | | | | | | |
| 10 | 740 | | | | | | | | | | | | |
| 15 | 735 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0-2' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/29/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID SS<br>**Rig Type:** CME 55 | **Northing:** 566540.98<br>**Easting:** 13306627.95<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 2' bgs<br>**Surface Elevation:** 751.26<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-21<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | 1 | 0-2 | 11<br>12<br>18<br>22 | 30 | 1.2 | NA | NA | FL | × × × × × × × × × × × × | Coarse grained sand to cobble-sized angular large AGGREGATE. Fill.<br>Black (10YR 2/1) ASH and CINDERS/SLAG, Silt to coarse angular sand-sized fragments, no odor, dense, aplastic, damp with rainfall. Ash/Slag/Fill. | FILL | Borehole backfilled with bentonite to grade. |
| 5 | 745 | | | | | | | | | | | | |
| 10 | 740 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0-2' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/29/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID SS<br>**Rig Type:** CME 55 | **Northing:** 566478.46<br>**Easting:** 13306574.54<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 2' bgs<br>**Surface Elevation:** 751.08<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-22<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | 1 | 0-2 | 5<br>10<br>12<br>16 | 22 | 1.7 | NA | NA | ML | | Very dark brown (10YR 2/2) SILT, some Clay, little fine subangular Sand, no odor, dense, aplastic, damp with rainfall. Topsoil (first foot) indicated by presence of roots and vegetation. Topsoil/Fill. | SILT | Borehole backfilled with bentonite to grade. |
| | | | | | | | | | SP | | Yellow-brown (10YR 5/4) fine poorly-graded subangular SAND, little Silt, trace Clay, no odor, dense, aplastic, dry. Fill. | | |
| 5 | 745 | | | | | | | | | | | | |
| 10 | 740 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0-2' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/30/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 566259.56<br>**Easting:** 13306721.26<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 5' bgs<br>**Surface Elevation:** 751.11<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-23<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | 1 | 1-3 | NA | NA | NA | NA | NA | ML | | Dark gray-brown (10YR) SILT with fine to cobble-sized angular predominantly large aggregate, no odor, dense, aplastic, damp with rain. Aggregate-Fill. Sampled by shovel due to large quantity of aggregate. | SILT | Borehole backfilled with bentonite (0-5' bgs). |
| | | 2 | 3-5 | 7<br>7<br>13<br>14 | 20 | NA | NA | NA | SM | | Black (10YR 2/1) Silty SAND with fine, poorly graded subangular Sand, no odor, moderately dense, aplastic, saturated. Foundry Sand. | | |
| 5 | 745 | | | | | | | | ML | | Gray (10YR) SILT, some Clay, little fine to coarse subangular to subrounded Sand, no odor, dense, aplastic, dry. Till. | SILT | |
| 10 | 740 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0-2' bgs.

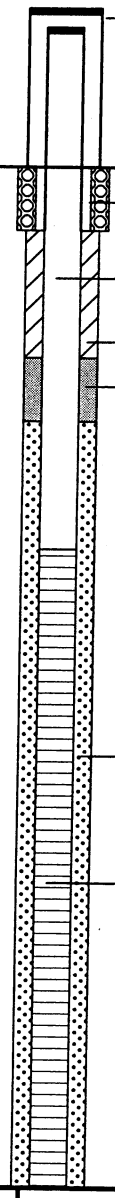
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/23/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 ATV | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-24<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-2 | 2 3 1 2 | 4 | 1.4 | 0.0 | - | ML | | Very dark gray-brown (10YR 3/2) SILT, little Clay, no odor, moist, moderately dense, organic matter such as Roots present, aplastic. Topsoil.<br>Becomes brown (10YR 4/3), increasing dense, increased Sand content to few fine to coarse subrounded. | SILT |
| | | 2 | 2-4 | 20 10 5 3 | 15 | 0.8 | 0.0 | - | | | | |
| | | | | | | | | | Con. | | Weathered CONCRETE. | FILL |
| 5 | 5 | 3 | 4-6 | 2 3 2 2 | 5 | 1.5 | 0.0 | - | ML | | Yellow-brown (10YR 5/4) SILT, little Clay, few fine subangular Sand, no odor, dense, damp, aplastic. | SILT |
| | | 4 | 6-8 | 1 1 2 3 | 3 | 1.6 | 0.0 | - | | | Coarsens downward with increased Sand content. | |
| | | 5 | 8-10 | 2 2 1 1 | 3 | 1.8 | 0.0 | - | SM | | Yellow-brown (10YR 5/4) fine to medium poorly sorted subangular to subrounded Silty SAND, little Clay, moist, loose to moderately dese, aplastic.<br>Saturated. | SILTY SAND |
| 10 | 10 | 6 | 10-12 | 1 1 2 3 | 3 | 1.5 | 0.0 | - | | | | |
| | | 7 | 12-14 | 3 4 4 5 | 8 | 1.1 | 0.0 | - | | | Faintly varved. | |
| 15 | 15 | 8 | 14-16 | 1 2 4 5 | 6 | 2.0 | 0.0 | - | CH/ CL | | Gray (10YR 6/1) Silty Fat to lean CLAY, soft, highly plastic, no odor, soft, moist. | SILTY CLAY |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2' and 6-8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/23/02 | 8.9' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-10-24

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 3<br>3<br>3<br>3 | 6 | 2.0 | 0.0 | - | CH/<br>CL | | Gray (10YR 6/1) Silty Fat to lean CLAY, soft, highly plastic, no odor, soft, becomes dry with depth.<br>Becomes a Lean Clay, moderately plastic. | SILTY CLAY | Global Filter Sand 4-18' bgs<br>PVC Cap |
| 20 | 20 | | | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2' and 6-8' bgs.

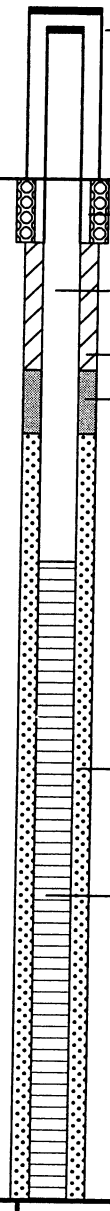
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/23/02 | 8.9' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/23/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 ATV | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-25<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-2 | 2 3 3 2 | 6 | 1.6 | 0.0 | - | ML | | Very dark gray-brown (10YR 3/2) SILT (ML), some Clay, few fine to coarse grained subrounded to rounded Sand, no odor, damp, moderately dense, aplastic, organic matter such as roots present. Topsoil. | SILT |
| | | 2 | 2-4 | 4 4 6 7 | 10 | 1.4 | 0.0 | - | CL | | Yellow-brown (10YR 5/4) with black (10YR 2/1) mottling, Lean CLAY (CL), some Silt, few fine to coarse grained subrounded to rounded Sand, weakly plastic, stiff, no odor, dry, Native Till used as backfill. | CLAY |
| | | | | | | | | | ML | | Yellow-brown (10YR 5/4) SILT (ML), little Clay, few fine subangular Sand, no odor, Root structures present, damp, dense, aplastic. Fill with old topsoil. | SILT |
| 5 | 5 | 3 | 4-6 | 2 3 3 3 | 6 | 1.8 | 0.0 | - | | | Brown (10YR 4/3) SILT (ML), little Clay, no odor, aplastic, dense, damp, coarsens downward. Very dark gray-brown (10YR 3/2), Root structures present and Old Topsoil from 3.6' - 3.8' bgs. | SILT |
| | | 4 | 6-8 | 2 3 5 4 | 8 | 1.3 | 0.0 | - | SP | | Yellow-brown (10YR 5/8) poorly graded subangular SAND (SP) with Silt, few Clay, no odor, damp, becomong wet with depth, moderately dense to loose. Moist. | SAND |
| | | 5 | 8-10 | 4 6 6 5 | 12 | 2.0 | 0.0 | - | | | Saturated, increased Silt content. | |
| 10 | 10 | 6 | 10-12 | 2 3 3 3 | 6 | 1.8 | 0.0 | - | | | | |
| | | 7 | 12-14 | 1 1/ 18" | - | 1.7 | 0.0 | - | | | Faint varves present. | |
| 15 | 15 | 8 | 14-16 | 2 3 3 3 | 6 | 1.3 | 0.0 | - | CH/ CL | | Gray (10YR 6/1) Silty fat CLAY (CH), increaded stiffness and decreased moisture with depth, highly plastic, no odor, saturated with decreased moisture with depth, no odor. | SILTY CLAY |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2' and 6-8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/23/02 | 8.5' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-10-25

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 2<br>3<br>2<br>5 | 5 | 0.9 | 0.0 | - | CH/<br>CL | | Gray (10YR 6/1) Silty fat CLAY to Lean CLAY (CH/CL), increaded stiffness and decreased moisture with depth, highly plastic, no odor, saturated with decreased moisture with depth, no odor.<br><br>17.2': Lean CLAY (CL), moderately plastic, stiff, moist. | SILTY CLAY | Global Filter Sand 4-18' bgs<br>PVC Cap |
| 20 | 20 | | | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2' and 6-8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/23/02 | 8.5' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/12/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Camperon<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 75 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-26<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | Fill | | Cobble-sized to pebble-sized angular, predominantly fossiliferous, limestone GRAVEL, loose, dry, no odor. Aggregate. | Aggregate | Cement pad 0-0.8' bgs.<br>Grout 0.8-3' bgs.<br>Bentonite seal 3-4' bgs. |
| 5 | 5 | 1 | 4-6 | 2 5 5 5 | 10 | 1.5 | NA | - | SM | | Light yellow-brown (10 YR 6/4) Silty fine poorly graded SAND, trace Clay, aplastic, no odor, moderately dense, damp. Fill sand. | SILTY SAND | 2" ID Sch. 40 PVC riser to 5' bgs. |
| | | 2 | 6-8 | 4 4 3 2 | 7 | 1.8 | NA | - | | | Yellow-brown (10 YR 5/4), moist.<br>Saturated. | | |
| | | 3 | 8-10 | 3 2 2 1 | 4 | 1.5 | NA | - | | | Silt with Sand (ML), occasionally varved. | | Sandpack 4-16' bgs. |
| 10 | 10 | 4 | 10-12 | 2 2 3 3 | 5 | 1.4 | NA | - | | | Silty Sand (SM). | | |
| | | 5 | 12-14 | 3 7 5 5 | 12 | 1.6 | NA | - | | | Trace fine to coarse subangular Gravel, few coarse subangular Sand. | | 2" ID Sch. 40 PVC 0.01" slotted screen 5-15' bgs. |
| 15 | 15 | 6 | 14-16 | woh 2 2 3 | 4 | 1.8 | NA | - | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
woh = Weight of Hammer.
Sample collected 4-6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/12/02 | 7.6' | |

Project: 64410.101 Template: j:\rockware\logplot2001\logfiles\64410\Auger_well.ldf
Data File:RFI-10-26.dat Date: 2/7/02

| | | |
|---|---|---|
| **Date Start/Finish:** 1/15/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Camperon<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 75 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-10-27<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | Fill | | Mixed Asphalt and Concrete. | FILL | Borehole backfilled with bentonite to grade. |
| | | 1 | 1-3 | 4 5 5 8 | 10 | 1.0 | NA | - | SP | | Very dark brown (10 YR 2/2) fine to medium, predominantly fine, SAND, some Silt, few Clay, aplastic, no odor, moderately dense, dry. Fill/Foundry sand. | | |
| | | 2 | 3-5 | 7 5 4 3 | 9 | 1.2 | NA | - | | | Black (10 YR 2/1) with yellow-brown (10 YR 5/4) mottling, fine to medium, predominantly fine, subangular SAND, poorly graded, little to some Silt, few Clay, Slag and metallic debris present and increasing with depth, no odor, dry, moderately dense. Slag and Foundry sand. | | |
| 5 | 5 | 3 | 5-7 | 3 2 2 2 | 4 | 1.8 | NA | - | | | | | |
| | | 4 | 7-9 | 2 2 3 5 | 5 | 0.8 | NA | - | CL | | Dark brown (10 YR 3/3) Silty CLAY, little to some fine subangular Sand, plastic to very plastic, no odor, moist, soft. Clay backfill. | | |
| 10 | 10 | 5 | 9-11 | 3 5 6 6 | 11 | 1.8 | NA | - | SM | | Yellow-brown (10 YR 5/4) Silty fine subangular poorly graded SAND, few Clay, local silt seams up to 2" wide, aplastic, no odor, damp, moderately dense to dense.<br>Moist. | SILTY SAND | |
| | | 6 | 11-13 | 5 6 8 10 | 14 | 1.7 | NA | + | | | Saturated. | | |
| | | 7 | 13-15 | 5 9 12 12 | 21 | 1.9 | NA | + | | | | | |
| 15 | 15 | 8 | 15-17 | 3 4 | 11 | 1.9 | NA | + | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3', 7-9', and 9-11' bgs.
+ = Positive Test Result

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/15/02 | 11.0' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-10-27

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 15-17 | 7 8 | 11 | 1.9 | NA | + | SM | | Gray (10 YR 6/1) Silty fine subangular poorly graded SAND, few Clay, local silt seams up to 2" wide, aplastic, no odor, damp, moderately dense to dense. Glacial-alluvial. | SILTY SAND | Borehole backfilled with bentonite to grade. |
| | | 9 | 17-19 | 3 4 5 5 | 9 | 1.5 | NA | + | | | Fining downward to lower contact. | | |
| 20 | 20 | | | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3', 7-9', and 9-11' bgs.
+ = Positive Test Result

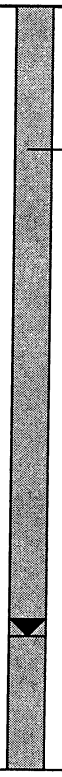
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/15/02 | 11.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/14/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Craig Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 562634.75<br>**Easting:** 13305120.81<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** 742.52<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-12-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | |
| 0 | | 1 | 0-2 | NA NA NA 4 | NA | 0.8 | 3.2 | - | FL | | CONCRETE. | FILL |
| | 740 | 2 | 2-4 | 1 1 1 1 | 2 | 1.2 | 3.8 | - | SP | | Yellow-brown (10YR 6/4) fine to medium subangular SAND, some Silt, trace to few Clay, aplastic, no odor, dry, loose. Fill. | SAND |
| 5 | | 3 | 4-6 | 1/12 1 2 | 2 | 0.6 | 1.6 | - | | | | |
| | 735 | 4 | 6-8 | 3 4 4 5 | 8 | 1.7 | 1.4 | + | ML | | Dark brown (10YR 3/3) SILT, little fine subangular Sand, few to trace Clay, no odor, aplastic, dry, loose. | SILT |
| | | 5 | 8-10 | 4 4 7 7 | 11 | 1.3 | 2.5 | - | SP | | Yellow-brown (10YR 5/4) fine to coarse subangular SAND, little fine to coarse subangular Gravel, little Silt, aplastic, no odor, dry, loose to moderately loose, local mottling to very dark gray (10YR 3/1).<br>Decreased Gravel to trace, no mottling after 8.8' bgs. | SAND |
| 10 | | 6 | 10-12 | 2 2 4 6 | 6 | 2.9 | 2.9 | - | ML | | Yellow-brown (10YR 5/4) SILT, little fine subangular Sand, little Clay, aplastic, no odor, moist, dense.<br>Increased Sand content to some, decreased Clay content to few, wet (saturated Clay). | SILT |
| | | | | | | | | | CL | | Dark gray (10YR 4/1) hard CLAY, some Silt, little fine to medium subangular to subrounded Sand, trace to few fine to coarse rounded Gravel, no odor, dry, homogeneous. (pp>4.5 tons/ sq. feet). Clay Till. | |
| | 730 | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |

Boring Construction




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

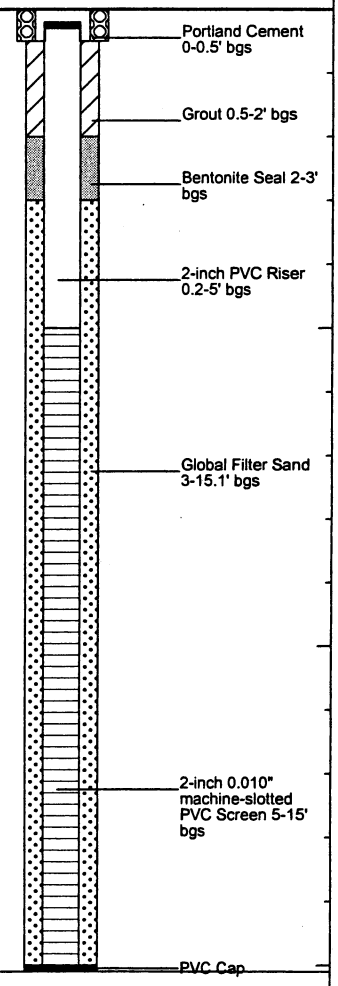
**Remarks:** bgs = below ground surface; + = Positive Test Result; NA = Not Applicable/Not Available;pp=pocket penetrometer. Temporary Well screen set from 7'-12' bgs with Sand to 5' bgs. Sample collected 1.2-2' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/15/01 | 9.9' | NA |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/14/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Craig Compeau<br>**Drilling Method:** HSA<br>**Sampler Size:** NA<br>**Auger Size:** 4 1/4"<br>**Rig Type:** CME 55 | **Northing:** 562633.23<br>**Easting:** 13305135.77<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 15.1' bgs<br>**Surface Elevation:** 741.98<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-12-01R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | NA | NA | NA | NA | NA | NA | | No Samples Taken. See log for RFI-12-01 for sampling information. | | |
| 5 | 5 | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.

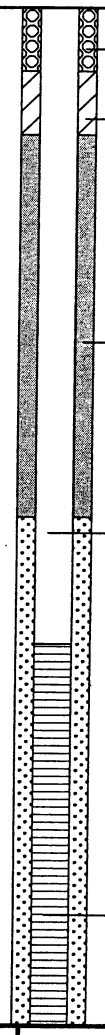
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/25/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 562501.75<br>**Easting:** 13305465.71<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** 742.41<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-12-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | |
| 0 | | | | | | | | | FL | | CONCRETE. | NCRE |
| | | 1 | 0-2 | NA 14 16 14 | 30 | 1.3 | 1.6 | - | SP | | Yellow-brown (10YR 5/4) fine to medium subangular SAND, some Silt, trace to few Clay, aplastic, slight odor, damp, moderately loose to locally dense. Fill | SAND |
| | 740 | 2 | 2-4 | 15 16 29 14 | 45 | 1.2 | 2.5 | - | | | Increased Silt content, to SAND with SILT (SM), increased density to dense. | |
| 5 | | 3 | 4-6 | 13/ 6" | NA | 0.3 | 1.8 | - | ML<br>FL | | Very dark gray-brown (10YR 3/2) SILT, little to some fine to coarse subangular Sand, little to few fine to coarse subangular to subrounded Gravel, aplastic, slight odor, damp, moderately dense. Fill.<br>CONCRETE. | CONCRETE |
| | 735 | 4 | 6-8 | 5 7 5 10 | 12 | 1.5 | 63.3 | - | CL | | Very dark gray (10 YR 3/1) Silty CLAY, little fine to medium subangular Sand, strong odor, very stiff, damp. (pp = 3 tons/square ft). Till. | SILTY CLAY |
| 10 | | 5 | 8-10 | 2 3 4 4 | 7 | 2.0 | 45.9 | + | | | Dark gray (10 YR 4/1) plastic CLAY, some Silt with local patches of Silty Clay with increased Silt content, little fine to coarse subangular to subrounded Sand, few subrounded to rounded fine to coarse Gravel, moderate odor, damp, hard to locally soft. (pp = 4-4.5 tons/sq. feet). Till. | CLAY |
| | | 6 | 10-12 | 2 3 4 5 | 7 | 1.8 | 50 | + | | | Increased moisture to moist, increased odor to moderate to strong, decreased stiffness to soft, increased Gravel to little. | |
| | 730 | 7 | 12-14 | 2 4 6 8 | 10 | 2.0 | 32.2 | + | | | | |
| 15 | | 8 | 14-15 | 3 18 | NA | NA | 75.4 | + | ML | | Dark gray-brown (10 YR 4/1) SILT, some Clay, little to some fine to coarse subangular Sand, little to few fine to coarse rounded Gravel, aplastic, moderate to slight odor, dense, wet to moist, oily sheen. | SILT |
| | | 9 | 15-17 | 3 7 | 15 | 1.5 | 592 | + | CL | | Dark gray CLAY as above at 8.5'-13.9' bgs.<br>Gray-brown (10 YR 5/2) Silty CLAY. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available
Redrilled to set permanent well. Geologic descriptions from 0-15' bgs are from the previous boring installed on 5/15/01.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/25/01 | 17.5' | |

**Client:** General Motors

**Site Location:** GM Flint, Flint, Michigan

**Boring ID:** RFI-12-02

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 15-17 | 8 10 | 15 | 1.5 | 592 | + | CL | | Gray-brown (10 YR 5/2) Silty CLAY, little fine to medium subangular to subrounded Sand, trace rounded to subrounded Gravel, stiff, weak odor, dry. Till. @17', moist. | SILTY CLAY | 2" ID Sch. 40 PVC 0.010" slotted screen 10-20' bgs. |
| | 725 | 10 | 17-19 | 5 12 17 17 | 29 | 1.8 | 1392 | + | ML | | Gray (10 YR 5/1) SILT, some to little Clay, few fine subrounded Sand, aplastic, dense, moderate odor, saturated. Till. | SILT | |
| | | 11 | 19-20 | 37 50/5" | NA | 1.0 | 973 | + | CL | | Dark gray CLAY, as at 8.5' - 13.9' bgs except hard (pp>4.5' tons/sq. feet bgs), locally oxidized along fractures to yellow-brown (10YR 5/2) for first 6-inches. Homogeneous dark gray at 19.5' bgs. Till. | CLAY | #5 Global filter sandpack 8-20' bgs. |
| 20 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 710 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available
Redrilled to set permanent well. Geologic descriptions from 0-15' bgs are from the previous boring installed on 5/15/01.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/25/01 | 17.5' | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists



Project: 644.10.022 Template: j:\rockware\logplot2001\logfiles\64410\Auger_well.ldf
Data File:RFI-12-02perm.dat Date: 8/9/01

| | | |
|---|---|---|
| **Date Start/Finish:** 5/23/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 562447.58<br>**Easting:** 13305595.85<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** 739.3<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-12-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | | | |
| 0 | | 1 | 0-2 | NA<br>11<br>13 | NA | 0.7 | 12.8 | - | ML | | Brown (10YR 5/3) to very dark gray-brown (10YR 3/2) aplastic SILT, some fine to coarse subangular Sand, trace Clay, little fine to coarse limestone Gravel Fill, weak intermittent odor, dry to damp, loose. | SILT | |
| | | | | | | | | | FL | | WOOD, possibly pine, strong odor. | | Borehole backfilled with Bentonite Chips to grade. |
| | | 2 | 2-4 | NA | NA | NA | NA | NA | GP | | Coarse angular limestone GRAVEL and PEBBLES (Fill). No split spoon sample collected. Rubbly drilling. | GRAVEL | |
| | 735 | 3 | 4-6 | 2<br>2<br>3<br>4 | 5 | 1.2 | 5.6 | - | ML | | Black (10YR 2/1) aplastic SILT, little yellow-brown (10YR 5/4) fine Sand, few Clay, moderate odor, loose to moderately dense, moist. Locally oxidized to dark yellow-brown (10YR 5/6). | SILT | |
| 5 | | 4 | 6-8 | 3<br>4<br>4<br>6 | 8 | 1.3 | 1.3 | - | | | | | |
| | | 5 | 8-10 | 2<br>2<br>5<br>3 | 7 | 1.6 | 5.3 | - | CL | | Gray-brown (10YR 5/2) CLAY, moderately stiff, some Silt, little fine to medium subrounded to subangular Sand, trace fine to coarse subrounded Gravel, no odor, dry to damp, (pp=2-2.5 tons/sq. feet). Locally mottled with light olive-brown and/or oxidized to yellow-brown (10YR 5/8). | CLAY | |
| | 730 | | | | | | | | | | | | |
| 10 | | 6 | 10-12 | 2<br>5<br>7<br>6 | 12 | 1.6 | 5.7 | - | | | Dark gray-brown (10YR 4/2) Sandy CLAY, some Silt, fine to coarse subangular Sand, few fine subangular to subrounded Gravel, trace weak odor, wet, loose to very soft. | | |
| | | 7 | 12-14 | 5<br>9<br>17<br>10 | 26 | 2.0 | 2.9 | - | | | CLAY, as above, but hard (pp=4.5 tons/sq. feet). Lenses of Silt (up to 1" thick) throughout, locally oxidized and mottled yellow-brown (10YR 5/4). | CLAY | |
| | 725 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Temporary well screen placed 1.5 to 11.5' bgs.
Sample collected 4-5.1' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/23/01 | 5.1' and 10.6' | |



Project: 644.10.022 Template: j:\rockware\logplot2001\logfiles\64410\Auger_well.ldf
Data File:RFI-12-03.dat Date: 8/2/01

| | | |
|---|---|---|
| **Date Start/Finish:** 5/15/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2" cont. acetate sleeve<br>**Auger Size:** 2 1/4"<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 562604.64<br>**Easting:** 13305591.13<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** 739.3<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-12-04<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | |
| 0 | | | | | | | SP | | Dark yellow-brown (10YR 4/6) SAND, trace subangular fine to medium Gravel, some Roots, loose. | | |
| | | | | | | | | | Dark grayish-brown (10YR 4/2) SAND, trace Silt and Clay, trace angular Gravel, medium dense, dry, no odor. Fill. | | |
| | | 1 | 0-2 | 1.7 | 0.0 | - | FL | | CONCRETE fragments, some medium Sand, loose, dry, no odor. Fill. | | Borehole backfilled with Bentonite to grade. |
| | | 2 | 2-4 | 1.7 | 0.0 | - | | | Black fine to medium SAND, trace Silt and Clay, trace angular Gravel, Cement fragments, moist. Fill. | | |
| | 735 | | | | | | | | Yellowish-brown fine SAND, trace Silt and Clay, aplastic, no odor, moist. Fill. | | |
| 5 | | 3 | 4-6 | 1.6 | 0.0 | - | SP | | Brown (10YR 5/3) fine SAND, little Silt, dense, no odor, moist. | SAND | |
| | | 4 | 6-8 | 2.0 | 0.0 | - | ML | | Black (10YR 2/1) SILT, trace Clay, dense, no odor, moist. | SILT and CLAY | |
| | | | | | | | CL | | Dark gray Silty CLAY, plastic, no odor, moist. | | |
| | | | | | | | ML | | Grayish-brown SILT, mottled with gray, dense, no odor, moist. | | |
| | 730 | 5 | 8-10 | 2.0 | 0.0 | - | SP | | Yellowish-brown 10YR 5/4 fine Silty SAND, no odor, wet. | SILT SAND and SAND | |
| 10 | | 6 | 10-12 | 2.0 | 0.0 | - | | | (10.0-10.8) Very dark gray fine Silty SAND, trace angular Gravel, no odor, loose, saturated.<br>(10.8-11.8) Pale brown 10YR 6/3 Silty SAND, dense, no odor, saturated. | | |
| | | | | | | | ML | | SILT, as at 8.3-9.3' bgs. | | |
| | | | | | | | SP | | Light brown fine to medium SAND, medium dense, no odor, wet. | | |
| | | 7 | 12-14 | 2.0 | 0.0 | - | ML | | Brownish-gray SILT, trace coarse Gravel, oxidation throughout, hard, dense, no odor, wet. | SILT | |
| | 725 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Temporary Well set at 14' bgs. Samples taken from 0-2' and 8'-10'.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/15/01 | 10' | NA |



Project: 644.10.022 Template: j:\rockware\logplot2001\logfiles\64410\Geoprobe.ldf
Data File:RFI-12-04.dat Date: 5/30/01

| | | |
|---|---|---|
| **Date Start/Finish:** 5/15/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2 1/2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 562989.47<br>**Easting:** 13305027.73<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 8' bgs<br>**Surface Elevation:** 742.4<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-12-05<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | | |
| 0 | | 1 | 0-2 | NA | NA | 0.0 | NA | NA | FL | | CONCRETE. | FILL | |
| | 740 | 2 | 2-4 | 1<br>1<br>1<br>1 | 2 | 0.6 | 2.8 | + | SP | | Light yellow-brown (10YR 6/4) fine to coarse (predominantly fine to medium) subangular SAND, some to little Silt, little to few fine to coarse subrounded to rounded Gravel, trace Clay, locally mottled to dark brown (10YR 3/3), weak odor, loose, damp. | SAND | Borehole backfilled with Bentonite Chips to grade. |
| 5 | | 3 | 4-6 | 1<br>1<br>1<br>1 | 2 | 0.5 | 2.5 | + | | | | | |
| | 735 | 4 | 6-8 | 1<br>1<br>2<br>2 | 3 | 1.8 | 2.9 | + | | | Black free product, moderate to strong odor, coalesces with exposure to air. | | |
| 10 | | | | | | | | | | | CONCRETE. Spoon refusal. | | |
| | 730 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result;
NA = Not Applicable/Not Available
Set temporary well at 8' bgs with 5' screen.
Sample collected 2-4' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |

**Date Start/Finish:** 5/24/01
**Drilling Company:** Rau Drilling
**Driller's Name:** Greg Compeau
**Drilling Method:** HSA/SS
**Sampler Size:** 2' x 2" ID
**Auger Size:** 2 1/4" ID
**Rig Type:** CME 55

**Northing:** 563021.34
**Easting:** 13305163.85
**Casing Elevation:** NA

**Borehole Depth:** 15' bgs
**Surface Elevation:** 742.77

**Descriptions By:** SM Duly

**Boring ID:** RFI-12-06

**Client:** General Motors

**Location:** GM Flint
Flint, Michigan

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | | |
| 0 | | | 0-1.2 | NA | NA | NA | NA | NA | FL | | CONCRETE. | FILL | |
| | 740 | 1 | 1.2-3.2 | 25 50 50 56 | 100 | 1.8 | 4.7 | - | ML/SP | | Very dark gray-brown (10YR 3/2) aplastic SILT with fine to medium subangular SAND, trace fine to coarse angular Gravel, trace Clay, damp, no odor, very dense, locally semi-lithified. | SILT & SAND | Borehole backfilled with Bentonite Chips to grade. |
| | | 2 | 3.2-5 | 36 50/4" | NA | 1.0 | 6.0 | - | | | Increased clay content to few. | | |
| 5 | | 3 | 5-7 | 60/6" | NA | 0.7 | 6.3 | - | | | | | |
| | 735 | 4 | 7-9 | 50/3" | NA | 0.6 | 6.8 | - | | | Increased moisture content to moist. | | |
| 10 | | 5 | 9-11 | 10 41 50/3" | NA | 1.2 | 1.2 | - | | | | | |
| | | 6 | 11-13 | 70/3" | NA | 0.2 | 0.7 | - | | | | | |
| | 730 | 7 | 13-15 | 29 50/3" | NA | NA | 1.0 | - | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Temporary well screen placed 8 to 13' bgs.
Samples collected 1.2-3.2' and 7.2-9.2' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/24/01 | 9.0' bgs | |

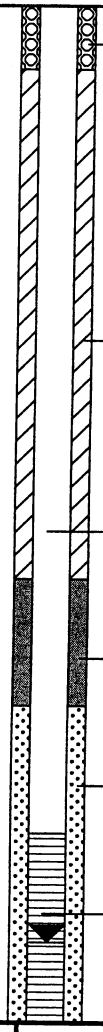


Project: 644.10.022 Template: j:\rockware\logplot2001\logfiles\64410\Auger_well.ldf
Data File:RFI-12-06.dat Date: 8/2/01

| | | |
|---|---|---|
| **Date Start/Finish:** 5/10/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** Direct push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:** NA<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 562441.23<br>**Easting:** 13305312.07<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19.7' bgs<br>**Surface Elevation:** 742.43<br><br>**Descriptions By:** Shawn Kerr | **Boring ID:** RFI-12-07<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | |
| 0 | | | | | | | | | | |
| | | 1 | 0-2 | 1.7 | 9.8 | NA | FILL | | CONCRETE. | FILL |
| | | | | | | | | | Black (10 YR 2/1) Silty fine SAND, trace Clay, trace coarse Sand, aplastic, dense, no odor, dry. (Fill - foundry sand) | SILTY SAND |
| | 740 | 2 | 2-4 | 2.0 | 13.5 | NA | | | | |
| 5 | | 3 | 4-6 | 2.0 | 19.5 | NA | | | | |
| | 735 | 4 | 6-8 | 1.8 | 24.5 | NA | | | | |
| | | 5 | 8-10 | 2.0 | 24.4 | NA | SW | | | |
| 10 | | 6 | 10-12 | 2.0 | 14.2 | NA | | | | |
| | 730 | 7 | 12-14 | 1.4 | 4.0 | NA | | | Grayish-brown (10 YR 5/2) SAND, angular, aplastic, medium dense, no odor, dry. | |
| | | | | | | | | | Black Silty SAND, same as 0.9-12.7' bgs. | SILTY SAND |
| | | | | | | | | | Grayish-brown SAND, as at 12.7-13.1' bgs. | |
| 15 | | 8 | 14-16 | 1.7 | 8.0 | NA | | | Black Silty SAND, same as 0.9-12.7, wet, saturated aat 14.7' bgs. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/10/01 | 14.7' | |

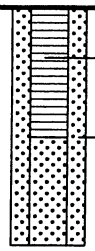
**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-12-07

**Borehole Depth:** 19.7' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SW | | Black Silty SAND, same as 0.9-12.7, wet. | | |
| | 725 | 9 | 16-18 | 2.0 | 24.8 | NA | CL | | Dark gray (10 YR 4/1) Silty CLAY, trace angular Gravel, moderately plastic, dense, moist. | | |
| | | | | | | | SM | | Dark gray (10 YR 4/1) Silty fine SAND, dense, no odor, saturated. Loose at 18' bgs. | SILTY SAND | |
| | | 10 | 18-20 | 2.0 | 35.1 | NA | | | Dense, wet. | | |
| | 20 | | | | | | ML | | Dark gray fine Sandy SILT, trace subrounded Gravel, very dense, hard, (pp=>4.5 tons/sq. ft.), no odor, dry. Dark gray Clayey Silt in tip of tube, trace fine Gravel, very stiff. | | |
| | 720 | | | | | | | | | | |
| 25 | | | | | | | | | | | |
| | 715 | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| | 710 | | | | | | | | | | |
| 35 | | | | | | | | | | | |




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

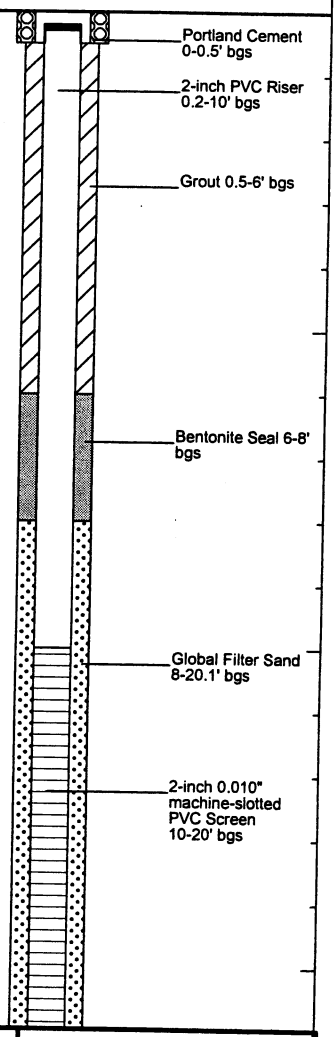
**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/10/01 | 14.7' | |

| | | |
|---|---|---|
| **Date Start/Finish:**<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Craig Compeau<br>**Drilling Method:** HSA<br>**Sampler Size:** NA<br>**Auger Size:** 3-1/4" ID HSA<br>**Rig Type:** | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20.1' bgs.<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-12-07R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | NA | NA | NA | NA | NA | NA | | No Samples Taken. See log for RFI-12-07 for sampling information. | | |
| 5 | 5 | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |

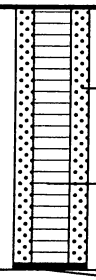
**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-12-07R

**Borehole Depth:** 20.1' bgs.

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NA | NA | NA | NA | NA | NA | | No Samples Taken. See log for RFI-12-07 for sampling information. | | |
| 20 | 20 | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | |




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/11/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Alan Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2" ID cont. acetate sleeve<br>**Auger Size:** 2 1/4"<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 22' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-12-08<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | FL | | CONCRETE. | Fill | |
| | | 1 | 0-2 | 1.0 | 9.7 | - | SP | | Yellowish-brown (10YR 5/4) fine SAND, trace Clay and Silt, aplastic, no odor, dry. Fill.<br>1.5:Black (10YR 2/1) SAND, trace rounded Gravel, aplastic, no odor, dry. Fill, Foundary Sand. | SAND | Borehole backfilled with Bentonite to grade. |
| | | 2 | 2-4 | 2.0 | 5.6 | - | | | SAND, as at 0.9-1.5' bgs, more dense, trace angular to subangular Gravel.<br>3.5: Dark grayish-brown (10YR 4/2) fine SAND, trace Silt and Clay, dry, no odor. | | |
| 5 | 5 | 3 | 4-6 | 2.0 | 7.5 | NA | | | SAND, as at 2-3.5' bgs.<br>4.3: Grayish-brown (10YR 5/2) fine SAND, trace Silt and Clay, aplastic, dense, no odor.<br>5.6: Black SAND, as at 1.5-2' bgs. | | |
| | | 4 | 6-8 | 2.0 | 51.5 | - | | | 6.0: Grayish-brown SAND, as at 4.3'-5.6' bgs.<br>7.5: Dark gray fine SAND, some Silt, moderately dense, odor, dry. FILL. | | |
| | | 5 | 8-10 | 2.02. | 9.7 | - | CL | | Gray Silty CLAY, moderately plastic, dry, no odor, very stiff. Clay Till. | SILTY CLAY | |
| 10 | 10 | 6 | 10-12 | 2.0 | 11.2 | NA | | | | | |
| | | 7 | 12-14 | 2.0 | 20.9 | NA | SP | | Dark gray (10YR 4/1) fine Silty SAND, little Clay, trace subangular Gravel, odor, loose. Glacial Alluvial. | | |
| | | | | | | | CL | | Dark gray (10YR 4/1) Silty CLAY, mottled with dark brown, slight odor, somewhat plastic, dry. Clay Till. | SILTY CLAY | |
| 15 | 15 | 8 | 14-16 | 2.0 | 26.7 | NA | SP | | Dark grayish-brown (10YR 4/2) fine SAND, trace Silt and Clay and angular Gravel, dense, odor, dry.<br>14.8:As at 0.9-1.5' bgs, but with odor. | SAND | |
| | | | | | | | CL | | Gray Silty CLAY, as at 12.7', no odor. Turns to SILT (ML) from 15.9-16'. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; pp=pocket penetrometer
NA = Not Applicable/Not Available
Set 1" temporary well at 21.8' bgs.
Samples collected 0-2', 6-8', 8-10', and 16-18' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 05/11/01 | 18.3' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-12-08

**Borehole Depth:** 22' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SP | | Yellow-brown SAND, as at 14.8'-15.1' bgs. | SILT and SAND | Borehole backfilled with Bentonite to grade. |
| | | | | | | | ML | | Gray Clayey SILT, plastic, no odor, moist. | | |
| | | 9 | 16-18 | 2.0 | 16.2 | NA | SP | | Light gray medium SAND, odor, moist. | | |
| | | | | | | | | | SAND, as at 16-16.4' bgs, trace Clay, no odor. | | |
| | | | | | | | ML | | Gray Clayey SILT, as at 16.4-16.9' bgs. | | |
| | | | | | | | SP | | Grayish-brown (10YR 5/2) Clayey SILT, trace fine Sand, medium dense, saturated at 18.3' bgs. | | |
| | | | | | | | ML | | Grayish-brown fine to medium Silty SAND, loose, saturated, no odor. | | |
| | | | | | | | | | Clayey SILT, as at 18'-18.5' bgs. | | |
| 20 | 20 | | | | | | SP | | Grayish-brown medium to coarse subangular to subrounded SAND, trace subangular Gravel, saturated, no odor. | | |
| | | | | | | | | | Grayish-brown fine SAND, medium dense, no odor, saturated. | | |
| | | | | | | | ML | | Grayish-brown Clayey SILT, trace angular Gravel, very stiff, no odor, dry, (pp = >4.5 tons/sq. ft.). | | |
| 25 | 25 | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; pp=pocket penetrometer
NA = Not Applicable/Not Available
Set 1" temporary well at 21.8' bgs.
Samples collected 0-2', 6-8', 8-10', and 16-18' bgs.

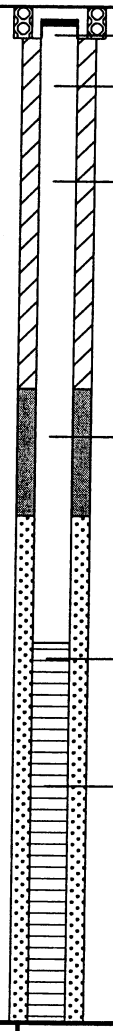
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 05/11/01 | 18.3' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/11/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Alan Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2" ID cont. acetate sleeve<br>**Auger Size:** 2 1/4"<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 562526.75<br>**Easting:** 13305129.84<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 22' bgs<br>**Surface Elevation:** 742.61<br><br>**Descriptions By:** SC Kerr | **Boring ID:** RFI-12-08R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | |
| 0 | | | | | | | FL | | CONCRETE. | FILL |
| | | 1 | 0-2 | 1.0 | 9.7 | - | SP | | Yellowish-brown (10YR 5/4) fine SAND, trace Clay and Silt, moderately dense, aplastic, no odor, dry. Fill. | SAND |
| | 740 | 2 | 2-4 | 2.0 | 5.6 | - | | | 3.5: Dark grayish-brown (10YR 4/2) fine SAND, trace Silt and Clay, dry, no odor. | |
| 5 | | 3 | 4-6 | 2.0 | 7.5 | NA | | | SAND, as at 2-3.5' bgs.<br>4.3: Grayish-brown (10YR 5/2) fine SAND, trace Silt and Clay, aplastic, dense, no odor.<br>5.6: Black SAND, as at 1.5-2' bgs. | |
| | | 4 | 6-8 | 2.0 | 51.5 | - | | | 6.0: Grayish-brown SAND, as at 4.3'-5.6' bgs.<br>7.5: Dark gray fine SAND, some Silt, moderately dense, odor, dry. FILL. | |
| | 735 | 5 | 8-10 | 2.02 | 9.7 | - | CL | | Gray Silty CLAY, moderately plastic, dry, no odor, very stiff. Clay Till. | SILTY CLAY |
| 10 | | 6 | 10-12 | 2.0 | 11.2 | NA | | | | |
| | 730 | | | | | | SP | | Dark gray (10YR 4/1) fine Silty SAND, little Clay, trace subangular Gravel, odor, loose. Glacial Allucial. | |
| | | 7 | 12-14 | 2.0 | 20.9 | NA | CL | | Dark gray (10YR 4/1) Silty CLAY, pale brown mottling, slight odor, somewhat plastic, dry. Clay Till. | S-CLAY |
| 15 | | 8 | 14-16 | 2.0 | 26.7 | NA | SP | | Dark grayish-brown (10YR 4/2) fine SAND, trace Silt and Clay, trace angular Gravel, dense, odor, dry.<br>14.8:As at 0.9-1.5' bgs, but with odor. | SAND |
| | | | | | | | CL | | Gray Silty CLAY, as at 12.7', no odor. Turns to SILT from 15.9'-16'.Till. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; pp=pocket penetrometer
NA = Not Applicable/Not Available
Replaced temporary well.
Sampling information and stratigraphy from RFI-12-08.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/11/01 | 18.3' | |

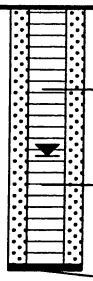
**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-12-08R

**Borehole Depth:** 22' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 725 | 9 | 16-18 | 2.0 | 16.2 | NA | SP-ML | | (16.0-20.6) Alternating glacio-alluvial sequence. | SAND AND SILT | Global Filter Sand 8-20.1' bgs; 2-inch 0.010" machine-slotted PVC Screen 10-20' bgs; PVC Cap |
| | | 10 | 18-20 | 2.0 | 5.0 | NA | | | | | |
| 20 | | 11 | 20-22 | 1.7 | 3.9 | NA | ML-CL | | Grayish-brown Clayey SILT, trace angular Gravel, stiff, no odor, dry, pp = >4.5. Till. | SILT | |
| | 720 | | | | | | | | | | |
| 25 | | | | | | | | | | | |
| | 715 | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| | 710 | | | | | | | | | | |
| 35 | | | | | | | | | | | |




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; pp=pocket penetrometer
NA = Not Applicable/Not Available
Replaced temporary well.
Sampling information and stratigraphy from RFI-12-08.

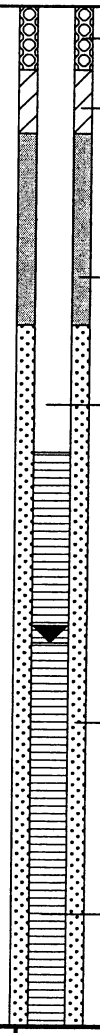
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/11/01 | 18.3' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/26/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 562968.87<br>**Easting:** 13305074.93<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 742.68<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-12-09<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | |
| 0 | | 1 | 0-2 | NA | NA | NA | NA | + | FILL | | CONCRETE. | FILL |
| | 740 | 2 | 2-4 | NA | NA | NA | NA | NA | | | | |
| 5 | | 3 | 4-6 | NA | NA | NA | NA | NA | | | | |
| | | 4 | 6-8 | NA | NA | NA | NA | NA | | | | |
| | 735 | 5 | 8-10 | 2 2 3 3 | 5 | NA | 16.1 | NA | ML | | Dark brown SILT, little fine to medium subangular to angular Sand, saturated with water, oil, and solvents, odor, moderately loose to moderately dense. | SILT |
| 10 | | 6 | 10-12 | 1 1 1 1 | 2 | 1.5 | >10000 | + | SM | | Black (10 YR 2/1) oily fine subangular Silty SAND, few Clay, trace fine rounded Gravel, aplastic, moderate to strong odor, loose, saturated. | SILTY SAND |
| | 730 | 7 | 12-14 | 1 2 3 4 | 5 | 1.2 | >10000 | + | | | | |
| 15 | | 8 | 14-16 | 4 6 8 13 | 14 | 1.6 | 3,777 | + | CL | | Gray (10 YR 5/1) Silty CLAY, little to few fine subangular to subrounded Sand, trace fine to medium rounded Gravel, moderate to weak odor, soft, damp to moist, silt lenses up to 1" wide throughout. | SILTY CLAY |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
+ = Positive Test Result
NA = Not Applicable/Not Available
Redrilled to set well. Geologic descriptions from 0-10' bgs are from the previous boring installed on 5/23/01.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/26/01 | 10' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-12-09

**Borehole Depth:** 18' bgs

| DEPTH / ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 725 | 9 | 16-18 | 4 6 7 9 | 13 | NA | 482 | NA | ML/ CL | | Gray (10 YR 5/1) SILT with CLAY, few fine subangular to subrounded Sand, moderate to weak odor, aplastic, moist. | SILT w/CLAY | 2" ID Sch. 40 PVC 0.020" slotted screen 7-17' bgs. #5 Global filter sandpack 5-18' bgs. |

DEPTH: 20, 25, 30, 35
ELEVATION: 720, 715, 710

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
+ = Positive Test Result
NA = Not Applicable/Not Available
Redrilled to set well. Geologic descriptions from 0-10' bgs are from the previous boring installed on 5/23/01.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/26/01 | 10' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/25/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 562490.19<br>**Easting:** 13305534.6<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** 738.84<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-12-10<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | | | |
| 0 | | | | | | | | | | | CONCRETE. | | |
| | | 1 | 0-2 | NA | | 2 | NA | NA | | | WOOD (old railroad ties). | FILL | |
| | | | | | | | | | | | GRAVEL, dry, loose, no odor. | GRAVEL | Borehole backfilled with Bentonite Chips to grade. |
| | | 2 | 2-4 | NA | NA | 2 | NA | NA | FILL | | CONCRETE. | | |
| | 735 | | | | | | | | | | GRAVEL, dry, loose, no odor. Fill. | | |
| 5 | | 3 | 4-6 | 50/ 5" - - | NA | 0.3 | 12.1 | + | | | Dark brown SILT, some fine to medium subangular Sand, little Clay, trace Wood debris, moderate solvent odor, damp, moderately loose to moderately dense. | SILT | |
| | | | | | | | | | | | CONCRETE. | CONCRETE | |
| | | 4 | 6-8 | 4 6 7 9 | 13 | 1.5 | 15.2 | + | | | Brown-black mottled CLAY, some Silt, little fine to medium subrounded to subangular Sand and fine to coarse Gravel, moderately oily, odor, damp. | CLAY | |
| | 730 | 5 | 8-10 | 6 8 8 10 | 16 | 2.0 | 16.5 | + | CL | | | | |
| 10 | | 6 | 10-12 | 4 7 13 10 | 20 | 1.8 | 14.7 | + | | | | | |
| | 725 | | 12-14 | 7 8 29 50 | 37 | NA | 13.1 | + | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; + = Positive Test Result; NA = Not Applicable/Not Available
Samples collected 4-6' and 6-8' bgs.
Temporary well screen placed 6.5 to 11.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/25/01 | 9.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/6/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 562945.44<br>**Easting:** 13305110.88<br>**Casing Elevation:** 742.17<br><br>**Borehole Depth:** 14.5' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** S. M. Duly | **Boring ID:** RFI-12-11S<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | | |
| 0 | | | | | | | | | | | Drilled to 14.5' bgs without sampling to install permanent well. See RFI-12-11D for geologic description. | | |
| | 740 | | | | | | | | | | | | Bentonite seal. |
| 5 | | | | | | | | | | | | | 2" ID Sch. 40 PVC 0.020" slotted screen (4.5-14.5' bgs). |
| | 735 | | NA | NA | NA | NA | NA | NA | NA | | | | |
| 10 | | | | | | | | | | | | | Sand pack. |
| | 730 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
See RFI-12-11D for geology.

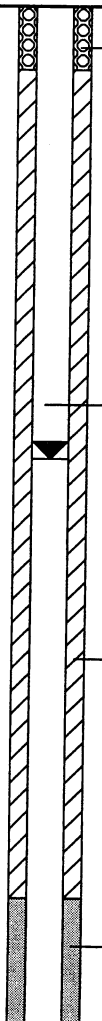
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | NA | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/5/01 - 6/6/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 562942.46<br>**Easting:** 13305110.91<br>**Casing Elevation:** 742.09<br><br>**Borehole Depth:** 25.1' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly/ SC Kerr | **Boring ID:** RFI-12-11D<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | |
| 0 | | | | | | | | | FL | | Concrete. | FILL |
| | 740 | 1 | 1.1-3.1 | 9 8 13 12 | 21 | 1.5 | 1.6 | - | ML | | Very dark brown (10YR2/2) SILT, little fine to coarse subangular Sand, trace Clay, aplastic, no odor, dry, dense, metallic and glassy debris, black and grey mottling. From 3' to 3.9' bgs, increase in Clay content to little. Dry to damp. | SILT |
| | | 2 | 3.1-5.1 | 5 8 5 4 | 13 | 1.7 | 3.7 | - | | | | |
| 5 | | 3 | 5.1-7.1 | 4 4 3 3 | 7 | 1.5 | 3.7 | - | | | Moist | |
| | 735 | 4 | 7.1-9.1 | 8 8 5 | 13 | 1.6 | 5.5 | - | | | Dark yellow-brown (10 YR 4/4) mottling. | |
| | | 5 | 9.1-11. | 3 5 6 6 | 11 | 1.8 | 25.8 | + | SP | | Dark grayish-brownish SILT, some fine to medium Sand, some Clay, slight odor, damp, dense. | |
| 10 | | | | | | | | | CL | | Gray (10 YR 5/1) CLAY, brown (10 YR 5/3) oxidation throughout, oily sheen, strong odor, some SILT, stiff, moist. | CLAY |
| | 730 | 6 | 11.1-13 | 3 3 4 10 | 7 | 1.3 | 54.3 | + | | | Local increase in SILT content. as seams up to 0.5 ". | |
| | | 7 | 13.1-15 | 4 5 6 8 | 11 | 1.7 | 24.8 | + | | | Saturated<br>14.3'-14.7' bgs, increase in silt content to Silty Clay. | |
| 15 | | 8 | 15.1-17 | 3 4 | 10 | 2.0 | 65.7 | + | | | No more Silt seams. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; + = Positive Test Result; NA = Not Applicable/Not Available
Samples collected 1.1-3.1' and 5.1-7.1' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/05/01 | 7.1' bgs. | |

**Client:**
General Motors

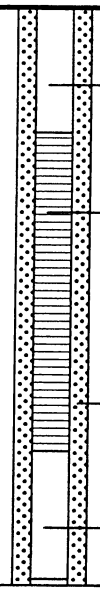
**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-12-11D

**Borehole Depth:** 25.1' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 15.1-17 | 6 7 | 10 | 2.0 | 65.7 | + | CL | | CLAY as above 10-15' bgs. | CLAY |
| | 725 | 9 | 17.1-19 | 4 6 11 19 | 17 | 1.6 | 62.2 | + | | | Silt seams again at 18.4' to 18.7' bgs. | |
| 20 | | 10 | 19.1-21 | 14 15 15 10 | 30 | 1.6 | 112 | + | ML | | Gray (10YR 5/1) Silt, little Clay. Little to few subangular Sand. Saturated, odor, dense. | SILT |
| | 720 | 11 | 21.1-23 | 9 21 35 30 | 56 | 1.6 | 50.1 | + | SP | | Grey fine to coarse subangular SAND. Trace subrounded Gravel. Saturated, strong odor, visible oil. At 22.2-22.8' bgs, alternating lenses of sand as at 20.7-22.2 ' bgs and silt as at 19.4-20.7' bgs. | SAND |
| 25 | | 12 | 23.1-25 | 13 20 21 25 | 41 | 1.7 | 18.6 | - | CL | | Dark grey CLAY. Stiff, hard. Some Silt. Little fine to coarse rounded Gravel. Little fine to medium Sand. Slight odor, dry. Clay Till. | CLAY |
| | 715 | | | | | | | | | | | |
| 30 | | | | | | | | | | | | |
| | 710 | | | | | | | | | | | |
| 35 | | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result; NA = Not Applicable/Not Available
Samples collected 1.1-3.1' and 5.1-7.1' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/05/01 | 7.1' bgs. | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/6/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14.5' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-12-12S<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FILL | | Concrete. | FILL | Cement pad with 7" diam. flush-mount cover.<br>Grout 0.8-1' bgs. |
| 5 | 5 | | NA | NA | NA | NA | NA | NA | ML | | Very dark brown (10YR2/2) SILT, little fine to coarse subangular Sand, trace Clay, aplastic, no odor, dry, dense, metallic and glossy debris, black grey mottling. From 3-3.9' bgs, increase in Clay content to little, dry to damp, moist at 5.1'. At 8.5' - 8.6' bgs, dark yellowish mottling (10YR 4/5). | SILT | Bentonite seal 1-2.5' bgs.<br>2" ID Sch. 40 PVC riser 0.2-4.3' bgs. |
| | | | | | | | | | | | Dark greyish-brownish SILT, some fine to medium Sand and Clay, slight odor, damp, dense. | | |
| 10 | 10 | | | | | | | | CL | | Grey (10 YR 5/1) CLAY, brown (10 YR 5/3) oxidation throughout. oily sheen, strong odor, some SILT, stiff, moist. At 12.7' bgs, local increase in SILT content as seams up to 0.5 ", saturated at 13.3' bgs. 14.3-14.7' bgs, increase in silt content to Silty Clay. | CLAY | #5 Global filter sandpack 2.5-14.5' bgs.<br>2" ID Sch. 40 PVC 0.020" slotted screen 4.3-14.3' bgs. |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Geologic description form RFI-12-11, located ~3' to north.
Blind drilled to 14.5' bgs.

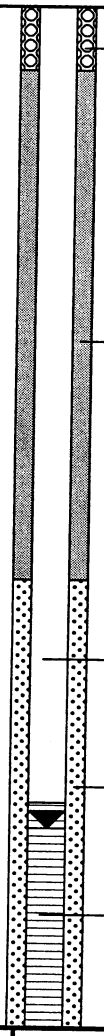
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/6/01 | 9.95' bgs. | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/22/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau / Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 562852.98<br>**Easting:** 13305089.4<br>**Casing Elevation:** 742.15<br><br>**Borehole Depth:** 25' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly / SC Kerr | **Boring ID:** RFI-12-14<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | |
| 0 | | | | | | | | | | | Concrete. | Concrete |
| | 740 | | 1-3 | NA | NA | NA | NA | NA | FL | | | |
| | | | 3-5 | NA | NA | NA | NA | NA | | | | |
| 5 | | | 5-7 | 10<br>9<br>8<br>6 | 17 | NA | NA | NA | | | No recovery. | |
| | 735 | 1 | 7-9 | 2<br>2<br>1<br>2 | 3 | 1.6 | 27.3 | - | ML | | Black (10 YR 2/1) SILT, little fine subangular Sand, trace Clay, damp, no odor, aplastic. Fill. | SILT |
| 10 | | 2 | 9-11 | 1<br>2<br>1<br>2 | 3 | 1.6 | 63.8 | - | SP | | Very pale brown (10 YR 7/3) fine subangular SAND, some Silt, aplastic, loose, damp, no odor. Fill. | SAND |
| | 730 | 3 | 11-13 | 1<br>1<br>2<br>2 | 3 | 1 | 67.5 | - | | | | |
| | | 4 | 13-15 | 3<br>3<br>4<br>4 | 7 | 1.6 | 134.0 | + | | | Color change to dark grayish brown (10 YR 4/2). | |
| 15 | | 5 | 15-17 | 4<br>6 | 12 | 1.4 | 148.0 | + | CL | | Gray CLAY (10 YR 5/1),some Silt and fine to medium subangular Sand, few fine to coarse subangular Gravel, weak indeterminate odor, damp, stiff, moist to wet at 16.0' bgs with Silt lenses up to 3" wide and sand lenses up to 4" wide, oil sheen, moderate odor. At 18.0', silt lenses up to 6" wide. Clay Till. | CLAY |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available.
Samples collected 7-9' and 9-11' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/06/01 | 12.9' | |

**Client:**
General Motors

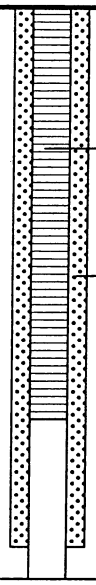
**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-12-14

**Borehole Depth:** 25' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5 | 15-17 | 6 8 | 12 | 1.4 | 148.0 | + | CL | | Gray CLAY as above (13.7'-16' bgs). | CLAY |
| | 725 | 6 | 17-19 | 4 6 7 13 | 13 | 1.4 | 229.0 | + | | | | |
| 20 | | 7 | 19-21 | 11 19 31 33 | 50 | 1.7 | 337.0 | + | SP | | Gray fine to medium subangular to subrounded SAND, some Silt, few fine to coarse well rounded Gravel, moderate odor. Fines downward to a silt on the last 3". Glacial-alluvial. | SAND |
| | | | | | | | | | CL | | CLAY as above (13.7'-19' bgs) but hard. Clay Till. | CLAY |
| | 720 | 8 | 21-23 | 10 16 28 31 | 44 | 2 | 240.0 | + | SP | | SAND as above (19'-20.2' bgs). Glacial-alluvial. | SAND |
| | | 9 | 23-25 | 16 25 33 36 | 58 | 1.8 | 619.0 | - | CL | | Gray CLAY as at 13.7'-14' but very hard and dry. Weak odor. Clay Till. | CLAY |
| 25 | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | |
| 30 | | | | | | | | | | | | |
| | 710 | | | | | | | | | | | |
| 35 | | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available.
Samples collected 7-9' and 9-11' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/06/01 | 12.9' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/08/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 562407.81<br>**Easting:** 13305499.84<br>**Casing Elevation:** 742.13<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** S. Kerr & S.M. Duly | **Boring ID:** RFI-12-15<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | | |
| 0 | | 1 | 0-2 | NA<br>12<br>8<br>6 | 20 | 1.5 | 1608 | - | FL | | Concrete. | | Cement pad with 7" diam. flush-mount cover.<br>Grout 1-1.5' bgs. |
| | 740 | 2 | 2-4 | 4<br>5<br>4<br>3 | 9 | 1.3 | 1377 | - | SP | | Yellowish brown (10 YR 5/6) fine to medium SAND, some Silt, damp, dense, no odor. Fill. | SAND | Bentonite seal 1.5-5' bgs. |
| 5 | | 3 | 4-6 | 3<br>4<br>5<br>7 | 9 | NA | NA | - | FL | | Concrete. At 12.0' bgs, Cinderblock? | CONCRETE | 2" ID Sch. 40 PVC riser 0.2-7.8' bgs. |
| | 735 | 4 | 6-8 | 2<br>3<br>4<br>5 | 7 | NA | NA | + | | | | | |
| | | 5 | 8-10 | 3<br>5<br>4<br>3 | 9 | NA | NA | + | | | | | #5 Global filter sandpack 5-19' bgs. |
| 10 | | 6 | 10-12 | 9<br>18<br>50/<br>0.1' | 68 | NA | NA | + | | | | | |
| | 730 | 7 | 12-14 | NA | NA | NA | NA | NA | | | | | |
| 15 | | 8 | 14-16 | NA | NA | NA | NA | NA | | | | | 2" ID Sch. 40 PVC 0.020" slotted screen 7.8-17.8' bgs. |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available.
Sample collected 1-3' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/8/01 | 17.5' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-12-15

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | FL | | Concrete. At 12.0' bgs, Cinderblock? | CONCRETE | 2" ID Sch. 40 PVC 0.020" slotted screen 7.8-17.8' bgs. |
| | 725 | 9 | 16-18 | NA | NA | 1.8 | 1145 | NA | CL | | Gray CLAY, some Silt and Silt lenses up to 2" wide, trace subangular Gravel and fine to medium Sand, dense, dry to damp, hard, no odor. Saturated at 17.5'. Local oxidation after 18.0' bgs. | ← CLAY → | #5 Global filter sandpack 5-19' bgs. |
| | | 10 | 18-19 | NA | NA | NA | NA | NA | | | | | |
| 20 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 710 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available.
Sample collected 1-3' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/8/01 | 17.5' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/10/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-12-16<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | CONCRETE. | CONCRETE | |
| | | 1 | 1-3 | 5<br>11<br>12<br>11 | 23 | 1.5 | 0.0 | - | SM | | Light yellowish-brown (10 YR 6/4) Silty SAND, fine to medium (predominantly fine) subangular SAND; few Clay; aplastic, moderately dense, dry, no odor. Fill. | SILTY SAND | Borehole backfilled with Bentonite to grade. |
| | | 2 | 3-5 | 4<br>8<br>8<br>8 | 16 | 1.2 | 0.0 | - | | | Silt to coarse pebble-sized angular SLAG(?) fragments; aplastic, dry, loose, no odor. | FILL | |
| 5 | 5 | | | | | | | | FL | | CONCRETE. | CONCRETE | |
| | | 3 | 6-8 | 7<br>17<br>16<br>24 | 33 | 1.2 | 0.0 | + | SP | | Brown (10 YR 4/3) angular fine to coarse SAND, some Silt, trace Clay, few fine to coarse subangular Gravel and Pebbles; dry, loose, no odor. Backfill and building debris mixed. Rubbly drilling | SAND | |
| | | 4 | 8-10 | 36<br>50/<br>3" | NA | NA | 0.0 | + | | | at 9.8': Mixed with black (10 YR 2/1) Silty CLAY (CL); soft, damp. | | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result; NA = Not Available; Not Applicable
Samples collected 1-3', 6-8' and 8-10' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 9/7/01 - 9/10/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID; 2" ID acetate sleeve<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-12-17<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | CONCRETE. | | |
| | | 1 | 0-3 | NA | NA | 2.5 | 0.0 | - | SM | | Yellowish-brown (10 YR 5/4) Silty fine to medium subangular to subrounded SAND (SM), few Clay, trace fine to coarse rounded to subrounded Gravel, moderately dense, damp, no odor. Backfill. | SILTY SAND | Borehole backfilled with Bentonite to grade. |
| | | 2 | 3-6 | NA | NA | 3.0 | 0.0 | - | | | | | |
| 5 | 5 | | | | | | | | FL | | Black 10YR 5/1 very fine to coarse angular Sand- to Gravel-sized SLAG (?) fragments, no odor, dry, moderately loose, aplastic. | FILL | |
| | | 3 | 6-8 | 3<br>4<br>4<br>5 | 8 | 2.0 | 0.0 | + | ML | | Black 10YR 2/1 SILT (ML), some Clay, little fine to coarse subangular Sand, trace fine to medium subrounded Gravel, no odor, damp, moderately dense, Slag also present. Backfill mixed with Slag. | SILT | |
| | | 4 | 8-10 | 4<br>4<br>6<br>6 | 10 | 1.5 | 0.0 | + | | | Gray 10YR 5/1, moderate odor.<br>Oily sheen in material in shoe. | | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Available; Not Applicable
Samples collected 1-3', 6-8' and 8-10' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/10/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10.0' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-12-18<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | Concrete. | | |
| | | 1 | 1-3 | 9<br>13<br>17<br>22 | 30 | 1.2 | 0.0 | - | ML | | Yellow-brown (10YR 5/6) SILT, some fine to medium subangular Sand, few Clay, trace fine rounded Gravel; aplastic, no odor, dense, dry. Backfill. | SILT | |
| | | 2 | 3-5 | 27<br>50/<br>3"<br>NA | NA | 0.9 | 0.0 | - | | | | | |
| 5 | 5 | | | | | | | | FL | | Concrete. | CONCRETE | Borehole backfilled with Bentonite to grade. |
| | | 3 | 6-8 | 17<br>12<br>10<br>9 | 22 | 1.0 | 0.0 | + | ML | | Dark gray-brown (10YR 4/2) SILT, some Clay, little fine to coarse subangular Sand, aplastic, moderate odor, damp, moderately dense to dense. Slag and cement debris also present. Backfill. | SILT | |
| | | 4 | 8-10 | 2<br>3<br>4<br>6 | 7 | 1.5 | 0.0 | + | CL | | Gray (10YR 5/1) Silty CLAY, little fine to coarse subrounded Sand, trace fine rounded Gravel, soft, moderate odor, damp. | | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result; NA = Not Available; Not Applicable
Samples collected 1-3', 6-8' and 8-10' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

Project: 644.10.023 Template: j:\rockware\logplot2001\logfiles\64410\auger_well2.ldf
Data File:j:\rockware\logplot2001\logfiles\64410\RFI-12-18.dat Date: 09/26/01

| | | |
|---|---|---|
| **Date Start/Finish:** 09/11/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 5' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-12-20<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | NA | NA | NA | NA | NA | NA | NA | FL | | Concrete (reinforced). | FILL | Borehole backfilled with Bentonite to grade. |
| | | | | | | | | | SP | | Yellow-brown (10YR 5/4) Silty fine to medium subangular SAND, aplastic, no odor, damp, moderately dense. | | |
| | | | | | | | | | | | Concrete (reinforced). | | |
| | | | | | | | | | FL | | Large diameter rebar to 5' bgs. | | |
| 5 | 5 | | | | | | | | | | End of boring: refusal. | | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Available; Not Applicable

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/27/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 21.0' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-12-21<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | Concrete (reinforced). | CONCRETE | Cement pad with 9" diam. flush-mount cover. |
| | | 1 | 1-3 | 3 3 3 3 | 6 | 1.6 | 0.0 | - | SM | | Brown (10YR 3/3) Silty SAND, poorly graded fine subangular Sand, few Clay, no odor, moderately dense, aplastic, moist. Fill. | SILTY SAND | Grout 1-5.5' bgs. |
| | | 2 | 3-5 | 3 4 5 | 8 | 1.7 | 0.0 | - | | | | | Bentonite seal 5.5-7.5' bgs. |
| 5 | 5 | 3 | 5-7 | 3 3 4 6 | 7 | 1.0 | 0.0 | - | | | 1" thick saturated lens. Perched.<br>1.5" thick saturated lens. Perched. | | 2" ID Sch. 40 PVC riser 0.2-9.5' bgs. |
| | | 4 | 7-9 | 4 6 8 13 | 14 | 1.0 | 0.0 | - | | | | | Global #5 sand pack 7.5-21' bgs. |
| 10 | 10 | 5 | 9-11 | 4 6 6 10 | 12 | 2.0 | 0.0 | - | CL | | Gray-brown (10YR) to gray (10YR 5/1) lean Silty CLAY, little to few fine to medium subangular to subrounded Sand, trace fine rounded Gravel, no odor, very stiff to stiff, weakly plastic, dry. Clay Till. Becomes gray (10YR 5/1) with occasional Silt lenses up to 1" thick, moist. | SILTY CLAY | 2" ID Sch. 40 PVC 0.010" slotted screen 9.5-19.5' bgs. |
| | | 6 | 11-13 | 3 4 4 4 | 8 | 2.0 | 0.0 | - | | | Becoming increasingly softer and moist. | | |
| | | 7 | 13-15 | WH 2 4 4 | 6 | 1.5 | 0.0 | - | | | Saturated SILT lenses approximately 2-3" thick throughout with moist, soft to moderately stiff fat Silty CLAY lenses in between. | | |
| 15 | 15 | 8 | 15-17 | 2 4 | 10 | 2.0 | 0.0 | - | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Available; Not Applicable
WH=Weight of Hammer.
Samples collected 1-3' and 9-11' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/27/01 | 12.8' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-12-21

**Borehole Depth:** 21.0' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 15-17 | 6<br>7 | 10 | 2.0 | 0.0 | - | CL | | Gray-brown (10YR) to gray (10YR 5/1) lean Silty CLAY, little to few fine to medium subangular to subrounded Sand, trace fine rounded Gravel, no odor, very stiff to stiff, weakly plastic, dry. Clay Till. Becomes gray (10YR 5/1) with occasional Silt lenses up to 1" thick, moist. | | |
| | | 9 | 17-19 | 10<br>11<br>16<br>14 | 27 | 1.6 | 0.0 | - | SM | | Gray (10YR 5/1) fine subrounded poorly graded Silty SAND, little Clay, no odor, moderately dense, aplastic, saturated. Glacial-alluvial. Coarsens downward. | SILTY SAND | |
| | | | | | | | | | SW | | Fine to coarse subangular to subrounded well-graded SAND, little Silt, few fine to coarse rounded Gravel with increased roundness associated with increased grain size, no odor, moderately dense, wet (saturated). Glacial-alluvial. | SAND | |
| 20 | 20 | 10 | 19-21 | 9<br>11<br>27<br>38 | 38 | 1.8 | 0.0 | - | CL | | Lean Silty CLAY, hard, weakly plastic, dry, as at 8.5 - 16.7' bgs. Clay Till. | | Global #5 sand pack 7.5-21' bgs. |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Available; Not Applicable
WH=Weight of Hammer.
Samples collected 1-3' and 9-11' bgs.

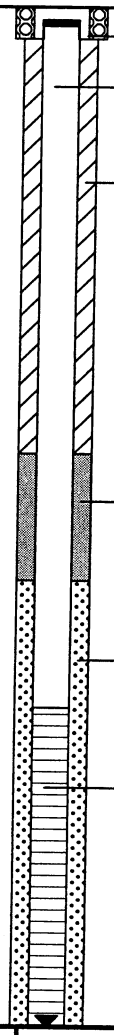
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/27/01 | 12.8' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/30/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3-1/4" ID HSA<br>**Rig Type:** CME 55 | **Northing:** 562618.64<br>**Easting:** 13305312.82<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 23' below grade<br>**Surface Elevation:** 742.06<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-12-22<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | NA | 0-1 | NA | NA | NA | NA | NA | FL | | CONCRETE. | FILL |
| | | 1 | 1-3 | 27<br>50/<br>5" | NA | 1.0 | 0.0 | - | SM | | Very dark brown (10YR) Silty fine to coarse subangular SAND, few Clay, few fine to coarse subrounded Gravel, Slag present, aplastic, well-graded, no odor, dry, moderately dense. Foundry Sand mixed with Slag. | SILTY SAND |
| | | 2 | 3-5 | 17<br>19<br>21<br>24 | 43 | 1.6 | 0.0 | - | | | | |
| 5 | 5 | 3 | 5-7 | 8<br>8<br>8<br>9 | 16 | 1.7 | 0.0 | - | | | Yellow-brown (10YR 5/1) Silty fine to medium subangular SAND (SM), few Clay, aplastic, poorly graded, no odor, dense, dry. Fill Sand. | |
| | | 4 | 7-9 | 3<br>7<br>12<br>14 | 19 | 1.1 | 0.0 | - | ML | | Very dark brown (10YR) SILT, little fine to coarse subangular Sand and Slag, little Clay, aplastic, no odor, dense, damp. Fill.<br><br>Dark brown (10YR) Silty CLAY (CL) lense, lean, plastic, stiff, no odor, dry from 8.3' - 8.5' bgs. | SILT |
| 10 | 10 | 5 | 9-11 | 3<br>4<br>5<br>5 | 9 | 1.0 | 0.0 | - | | | Gray (10YR 5/1) with yellow-brown (10YR 6/4) mottling, Silty lean CLAY, few fine to coarse subrounded Sand, no odor, plastic, stiff, dry. Clay Till. | SILTY SAND |
| | | 6 | 11-13 | 4<br>7<br>11<br>13 | 18 | 2.0 | 0.0 | - | CL | | | |
| | | 7 | 13-15 | 2<br>6<br>8<br>12 | 14 | 2.0 | 0.0 | - | | | Yellow-brown (10YR 6/4) occasional Silt lenses up to 2" wide throughout, damp, homogenous. | |
| 15 | 15 | 8 | 15-17 | 2<br>2 | 5 | 1.5 | 0.0 | - | | | Gray (10YR 5/1) Silt semas up to 4" thick, saturated, homogenous. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collecte 1.1-3.1' and 13.1-15.1' bgs.
+ = Positive Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/30/02 | 16' | |

**Client:**
General Motors

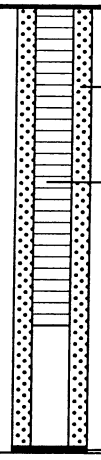
**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-12-22

**Borehole Depth:** 23' below grade

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 15-17 | 3<br>5 | 5 | 1.5 | 0.0 | - | CL | | Gray (10YR 5/1) with yellow-brown (10YR 6/4) mottling, Silty lean CLAY, few fine to coarse subrounded Sand, no odor, plastic, stiff, dry. Clay Till. | SILTY SAND |
| | | 9 | 17-19 | 3<br>5<br>11<br>19 | 16 | 1.8 | 0.0 | + | ML | | Gray (10YR 5/1) SILT, few fine to coarse rounded to subrounded Sand, aplastic, homogenous, saturated, weak to moderate odor, dense. Glacio-alluvial coarsens downward.<br>18.6': Black, oily material present, moderate odor. | SILT |
| 20 | 20 | 10 | 19-21 | 21<br>37<br>50/3<br>- | 87 | 1.5 | 0.0 | + | SW | | Brown (10YR 5/3) fine to coarse subangular SAND, little Silt, trace Clay, aplastic, weak odor, dense, saturated. Glacio-alluvial. Occasional lenses of very stiff Silty lean Clay throughout up to 5" wide, dry. | SAND |
| | | 11 | 21-23 | 86<br>50/5<br>-<br>- | NA | 0.0 | NA | NA | | | No Recovery. | |
| 25 | 25 | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collecte 1.1-3.1' and 13.1-15.1' bgs.
+ = Positive Test Result.

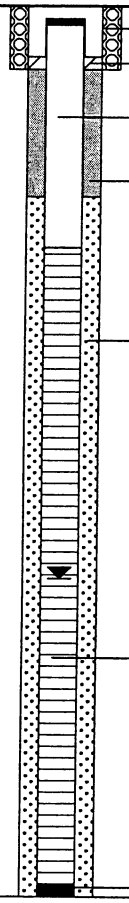
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/30/02 | 16' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/31/01 - 6/01/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" HSA<br>**Rig Type:** CME 55 | **Northing:** 561228.46<br>**Easting:** 13305510.63<br>**Casing Elevation:** 736.10<br><br>**Borehole Depth:** 6' bgs<br>**Surface Elevation:** 736.40<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-16-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 735 | 1 | SS | 11 7 11 11 | 18 | 1.3 | 16.5 | - | FL | CONCRETE. | FILL |
| | | 2 | SS | 10 10 8 6 | 18 | 1.4 | 8.3 | - | ML | Yellow-brown (10YR 5/6) SILT, little fine to medium Sand, trace Clay, aplastic, moderate "moth ball" odor", damp to dry, moderate dense to moderate loose. Fill. | SILT |
| 5 | 730 | 3 | SS | 8 8 5 6 | 13 | 1.3 | 25.1 | - | | Weak "moth ball" odor at 3.0' bgs. | |
| | | 4 | SS | 2 2 2 3 | 4 | 1.2 | 5.7 | + | | Moderate "moth ball" odor at 5.0' bgs. | |
| | | 5 | SS | 2 2 3 4 | 5 | 1.6 | 14.2 | + | CL | CONCRETE, Fill up to 1/2" above Concrete, Electrical or phone cable and "Ree-Bar" also present, saturated. | FILL |
| 10 | 725 | 6 | SS | - - 17 25 | 17 | 1.6 | 7.3 | + | | Gray-brown (10YR 5/2) Silty CLAY, some fine to coarse subangular Sand, little fine subangular Gravel, no odor, moist, moderately loose to loose. | CLAY |
| | | 7 | SS | NA | NA | NA | NA | NA | SP | Gray (10YR 5/1) oxidized locally and mottled to dark yellow-brown (10YR 4/4) CLAY, some Silt, little fine to medium subrounded to subangular Sand, increases in Silt to a moderately stiff Silty CLAY in 1" wide lenses throughout, no odor, stiff, dry. | |
| | | | | | | | | | | Dark gray-brown (10YR 4/2) fine to coarse subangular SAND, some Silt, little Clay, aplastic, weak oily hydrocarbon odor, wet to saturated, loose. | |
| | | | | | | | | | CL | Gray (10YR 5/1) CLAY as above from 9.1' - 11.9' bgs.<br>1" wide SAND (SP) seam at 13' bgs. | CLAY |
| 15 | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available; +=Positive Result.
Samples collected 1-3', 5-7' and 8-10' bgs.
Redrilled previous boring to set well.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/31/01 | 9.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/14/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Alan Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2' cont. acetate sleeve<br>**Auger Size:** 2 1/4"<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 561752.94<br>**Easting:** 13305488.1<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 24' bgs<br>**Surface Elevation:** 740.11<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-16-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 740 | | | | | | FILL | | CONCRETE. | | |
| | | 1 | 0-2 | 1.6 | 52.8 | - | SW | | Black (10 YR 2/1) fine SAND, trace Clay, aplastic, moderately dense, no odor, dry. (Fill, foundry sand) | SAND | |
| | | | | | | | FILL | | Concrete fragments, loose. | FILL | |
| | | 2 | 2-4 | 1.3 | 49.5 | - | SP | | Yellowish-brown (10 YR 5/4-1) SAND, some concrete rubble and subangular Gravel, loose, no odor, dry. (Fill) | SAND | |
| 5 | 735 | 3 | 4-6 | 2.0 | 33.8 | - | SW | | Yellowish-brown (10 YR 5/6) fine SAND, medium dense, no odor, dry. (Fill) | SAND | |
| | | | | | | | | | Black SAND, as at 0.4-1.7' bgs. | | Borehole backfilled with Bentonite to grade. |
| | | 4 | 6-8 | 2.0 | 24.0 | - | ML | | Yellowish-brown (10 YR 5/4) Clayey SILT, with gray mottling, aplastic, dense, no odor, moist. Till. | CLAYEY SILT | |
| | | 5 | 8-10 | 2.0 | 13.0 | - | | | | | |
| 10 | 730 | 6 | 10-12 | 2.0 | 27.1 | - | SP | | Brown fine SAND, trace Silt, little Clay, trace subangular Gravel, dense, no odor, dry. | SAND | |
| | | | | | | | CL | | Yellowish-brown Silty CLAY, somewhat plastic (pp=3 tons/sq. ft.), dry. | | |
| | | 7 | 12-14 | 2.0 | 26.0 | - | SP | | Dark grayish-brown fine to medium SAND, little Clay, trace subrounded Gravel, dense, no odor, moist. | SAND | |
| | | | | | | | ML | | Grayish-brown (10 YR 5/2) Clayey SILT, trace subrounded Gravel, dense, no odor, dry. | Clayey SILT | |
| 15 | 725 | 8 | 14-16 | 2.0 | 6.3 | NA | SP | | Dark grayish-brown fine SAND, little Clay, dense, no odor, wet. | SAND | |
| | | | | | | | SP | | Black SAND, as at 0.4-1.7' bgs, moist. | | |
| | | | | | | | ML | | Grayish-brown fine to medium SAND, trace Gravel, moderately dense, no odor, moist. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA=Not Applicable/Not Available.
Samples collected 0.4-2', 8-10, and 14-16' bgs; pp=pocket penetrometer; 1" temporary 5' 0.01" slot well set 21' bgs.
Encountered obstruction @ 14.5' bgs, moved 3' from original.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/14/01 | 17, 23.5' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-16-02

**Borehole Depth:** 24' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 2.0 | 13.4 | NA | ML | | no odor, moist. Yellowish-brown (10 YR 5/6) fine SAND, trace Clay, dense, no odor, moist. Gray (10 YR 5/1) SILT, trace Clay, aplastic, dense, no odor, dry. Moist at 18' bgs. Glacial Till. | SILT | |
| | | 10 | 18-20 | 2.0 | 17.9 | NA | ML | | Black SAND, as at 0.4-1.7' bgs. Gray (10 YR 6/1) SILT, aplastic, dense, no odor, dry. Glacial Till. | SILT | |
| 20 | 720 | 11 | 20-22 | 2.0 | 39.3 | - | | | Moist @ 20' bgs. | | Borehole backfilled with Bentonite to grade. |
| | | 12 | 22-24 | 2.0 | 23.2 | - | | | | | |
| 25 | 715 | | | | | | | | | | |
| 30 | 710 | | | | | | | | | | |
| 35 | 705 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA=Not Applicable/Not Available.
Samples collected 0.4-2', 8-10, and 14-16' bgs; pp=pocket penetrometer; 1" temporary 5' 0.01" slot well set 21' bgs.
Encountered obstruction @ 14.5' bgs, moved 3' from original.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/14/01 | 17, 23.5' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/15/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2' cont. acetate sleeve<br>**Auger Size:** 2 1/4"<br>**Rig Type:** 66 DT Advanced Geoprobe | **Northing:** 560842.32<br>**Easting:** 13305648.93<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** 731.35<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-16-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | |
| | | | | | 30.5 | | FL | | ASPHALT. | | |
| | | | | | | | SP | | Yellowish-brown (10YR 5/6) fine SAND, some angular Gravel, loose, no odor, aplastic, dry. | Fill | |
| | 730 | 1 | 0-2 | 1.2 | 1.2 | + | CL | | Dark yellowish-brown (10YR 5/6) Silty CLAY, dense, somewhat plastic. Till. | CLAY | |
| | | 2 | 2-4 | 1.5 | 29.6<br>2.3 | + | SP | | Dark brown fine to medium SAND, trace Clay, some oxidation, loose, dry. From 2.4-3.8' bgs-Dark yellowish-brown (10YR 4/4) fine SAND, little Clay, trace angular Gravel, medium dense. | SAND | Borehole backfilled with Bentonite to grade. |
| 5 | | 3 | 4-6 | 1.7 | 26.8<br>2.8 | + | | | Yellowish-brown (10YR 4/6) fine to medium SAND, moderately dense, aplastic, no odor, moist.<br>SAND, as at 2-2.4' bgs, trace Silt and coarse Sand.<br>Grayish-brown (10YR 5/2) fine to medium SAND, dark gray at bottom, medium dense, slight odor, moist to wet. | | |
| | 725 | 4 | 6-8 | 2.0 | NA | + | ML | | Gray (10YR 5/1) SILT, trace Clay and subangular to subrounded Gravel, slight odor, moist. | SILT | |
| | | 5 | 8-10 | 2.0 | NA | + | SP | | Dark gray (10YR 4/1) fine SAND, strong odor, loose, saturated. | SAND | |
| 10 | | | | | | | ML | | SILT, as at 7' - 8' bgs. | SILT | |
| | 720 | 6 | 10-12 | 2.0 | NA | + | SP | | Dark gray (10YR 4/1) fine SAND, dense, odor, moist. | SAND | |
| | | | | | | | ML | | SILT, as at 7' - 8' bgs. | SILT | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available
Samples collect from 0.5-2' and 4-6' bgs.
1" ID 10-ft 0.01" slot screen temporary well set at 12' bgs.

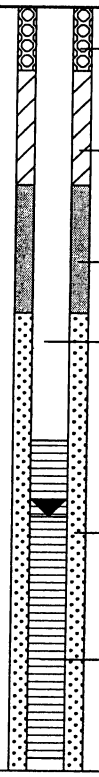
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/15/01 | 8' | NA |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/18/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 561093.41<br>**Easting:** 13305687.53<br>**Casing Elevation:** 732.27<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-16-04<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | | | | | | | | | | | |
| 0 | | | | | | | | | FL | | CONCRETE. | FILL |
| | | 1 | 0-2 | NA | NA | 2.0 | 1.8 | - | SP | | Yellowish-brown (10YR 5/6) fine SAND, trace Clay, aplastic, medium dense, no odor, dry. Fill. | SAND |
| | 730 | 2 | 2-4 | NA | NA | NA | 1.9 | + | | | | |
| 5 | | 3 | 4-6 | NA | NA | NA | 2.9 | + | ML | | Brown (10YR 4/3) Clayey SILT, trace fine Sand, no odor, moist. | SILT |
| | | | | | | | | | SP-M | | SAND as at 0.7-3' bgs with Clayey Silt as at 4.3-5.1'. | |
| | 725 | 4 | 6-8 | NA | NA | NA | NA | NA | | | No Recovery. | |
| | | 5 | 8-10 | woh/ 18" 32 | NA | 1.4 | 214 | + | ML | | Very dark gray (10 YR 3/1) SILT,some Clay, little fine to coarse subangular to subrounded Gravel, few fine rounded Gravel, moderate odor, wet, moderately dense. | SILT |
| 10 | | | | | | | | | | | Pine wood debris. | |
| | | 6 | 10-12 | woh/ 24" | NA | 0.0 | NA | + | FL | | No recovery. | |
| | 720 | | | | | | | | | | Concrete. | |
| 15 | | | | | | | | | | | | |

**Boring Construction**



- Cement pad with 9" diam. flush-mount cover.
- Grout 1-2.8' bgs.
- Bentonite hole plug 2.8-4.8' bgs.
- 2" ID Sch. 40 PVC riser 0.2-6.8' bgs.
- #5 Global filter sandpack 4.8-12' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 6.8-11.8' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; + = Positive Test Result NA = Not Applicable/Not Available; WOH=Weight of Hammer. Redrilled to set well. Geologic descriptions from 0-10' bgs are from the previous boring installed on 5/15/01.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/18/01 | 8.0' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/15/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2' cont. acetate sleeve<br>**Auger Size:** 2 1/4"<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 561395.15<br>**Easting:** 13305680.85<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** 734.58<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-16-05<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | | | | | | | | | | |
| 0 | | | | | | | FL | | CONCRETE. | FILL | |
| | | | | | | | SP | | Black (10YR 2/1) fine SAND, dense, no odor, moist. | FILL | |
| | | 1 | 0-2 | 1.2 | 12.9 | - | FL | | Brown (10YR 4/3) fine to medium SAND, dense, no odor, moist. | FILL | |
| | | | | | | | SP | | Yellowish-brown (10YR 5/4) fine to medium SAND, little rounded to subrounded Gravel, dense, no odor, moist. | FILL | |
| | | | | | | | | | CONCRETE fragments. | FILL | |
| | | | | | | | ML-CL | | SAND as at 0.3-1.1' bgs. | SILT and CLAY | Borehole backfilled with Bentonite to grade. |
| | | 2 | 2-4 | 1.7 | 16.8 | - | | | Very dark gray (10YR 3/1) Silty CLAY, highly plastic, soft, no odor, moist. | SILT and CLAY | |
| | | | | | | | CL-ML | | Dark yellowish-brown Clayey SILT, gray mottles, no odor, moist. | SILT and CLAY | |
| | 730 | | | | | | | | Very dark gray Clayey SILT, trace fine Sand, loose, no odor, wet, saturated at 4.2' bgs. | SILT and CLAY | |
| 5 | | 3 | 4-6 | 1.8 | 64 | - | SP | | Brown (10YR 4/3) coarse SAND, little fine to medium Sand, loose, saturated. | SAND | |
| | | | | | | | ML | | SILT as at 3.4' - 4' bgs. | SILT | |
| | | 4 | 6-8 | 1.7 | 109 | - | | | | SILT | |
| | | 5 | 8-10 | 2.0 | 52.7 | - | | | 6.6': Gray (10YR 6/1) and yellowish-brown (10YR 5/6) SILT, mottled, aplastic, no odor, dry, moist 8-10' bgs, some oxidation from 9-10' bgs. | SILT | |
| | 725 | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| | 720 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collect from 0.5-2' and 2-4' bgs.
1" Temporary Well set at 8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/15/01 | 4.2' | NA |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/14/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Alan Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** NA<br>**Auger Size:** NA<br>**Rig Type:** | **Northing:** 561541.01<br>**Easting:** 13305430.88<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** 737.64<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-16-06<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | |
| 0 | | | | | | | FL | | CONCRETE. | NCRE | |
| | | 1 | 0-2 | 1.5 | 63.2 | - | SW | | Dark yellowish-brown (10YR 4/4) fine to medium-grained SAND, trace Clay, medium dense, dry, aplastic, no odor. Fill. | SAND | |
| | | | | | | | | | Very dark brown fine SAND, medium dense, dry, no odor. Fill | | |
| | 735 | 2 | 2-4 | 1.9 | 54 | - | | | Dark yellowish-brown (10YR 4/4) fine to medium SAND, trace Clay, medium dense, dry, aplastic, no odor. Fill. | | |
| 5 | | 3 | 4-6 | 2.0 | 41.5 | - | ML | | Yellowish-brown Clayey SILT, dense, dry, no odor. | | |
| | | | | | | | | | SAND as at 0.7' to 1.7' bgs. | SAND and CLAY | |
| | | | | | | | CL | | Gray-brown (10YR 6/1) and (4/3) CLAY, dry dense, low plasticity, no odor, hard (pp >4.5). | | Borehole backfilled with bentonite to grade. |
| | | 4 | 6-8 | 2.0 | 13.8 | - | SW | | SAND as at 0.7-1.7' bgs. | | |
| | 730 | | | | | | CL | | CLAY, as at 5.6-6.7' bgs. | | |
| | | 5 | 8-10 | NA | 40.6 | - | SW | | SAND as at 0.7-1.7' bgs, saturated. | | |
| | | | | | | | CL | | CLAY, as at 5.6-6.7' bgs, with some reddish Clay and less gray. | | |
| 10 | | 6 | 10-12 | NA | 47.0 | - | SW | | SAND, as at 8.0-9.3' bgs. | | |
| | | | | | | | CL | | Dark gray CLAY, highly plastic, odor present, moist (pp=2 tons/sq. ft.). Clay Till. | | |
| | 725 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0.7-2' and 4-6' bgs.

1" ID 5-ft 0.01" slot screen temporary well set at 12' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/14/01 | 6.3' | |

Project: 644.10.011 Template: j:\rockware\logplot2001\logfiles\64410\geoprobe.ldf
Data File:RFI-16-06.dat
Date: 8/9/01

| | | |
|---|---|---|
| **Date Start/Finish:** 6/6/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 561118.6<br>**Easting:** 13305644.63<br>**Casing Elevation:** 733.26<br><br>**Borehole Depth:** 11.5' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** S. Kerr & S.M. Duly | **Boring ID:** RFI-16-07<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | | | | | | | | | | | | |
| 0 | | | | | | | | | FL | | ASPHALT. | Fill | |
| | | 1 | 0-2 | NA<br>12<br>8<br>6 | 20 | 1.5 | 129.0 | - | | | Dark yellowish-brown (10 YR 4/6) SILT, some fine to coarse Sand (mostly fine), little to some Clay, damp, moderately dense to moderately loose. Fill. | | |
| | | | | | | | | | | | Black (10 YR 2/1) SILT, some fine to medium Sand, trace Clay, no odor, damp, moderately dense to moderately loose. Fill. | | |
| | 730 | 2 | 2-4 | 4<br>5<br>4<br>3 | 9 | 1.0 | 160.0 | - | | | | | Permanent well installed 1.4-11.4' bgs. |
| 5 | | 3 | 4-6 | 3<br>4<br>5<br>7 | 9 | 1.8 | 141.0 | - | | | Moist. | | |
| | | | | | | | | | ML | | | SILT | |
| | | 4 | 6-8 | 2<br>3<br>4<br>5 | 7 | 1.5 | 115.0 | + | | | Wet. | | |
| | 725 | 5 | 8-10 | 3<br>5<br>4<br>3 | 9 | 1.7 | 131.0 | + | | | Oily sheen and odor present | | |
| 10 | | 6 | 10-12 | 9<br>18<br>50/<br>0.1' | 68 | 1.0 | 106.0 | + | | | | | |
| | | | | | | | | | | | Concrete. | | |
| | 720 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; + = Positive Test Result.
NA = Not Applicable/Not Available.
Set 2" temporary well at 11.4' bgs, 0.020" screen 1.4-11.4'.
Samples collected 0.5-2.5' and 4.5-6.5' bgs.

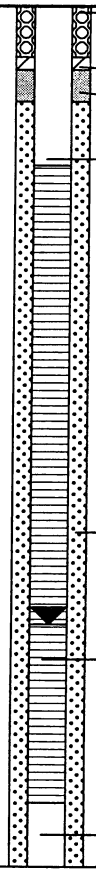
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/6/01 | 6.5' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/7/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau / Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 561183.32<br>**Easting:** 13305663.08<br>**Casing Elevation:** 733.18<br><br>**Borehole Depth:** 13.5' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly/ SC Kerr | **Boring ID:** RFI-16-08<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | | | | | | | | | | | |
| 0 | | | | | | | | | FL | | Concrete. | Fill |
| | 730 | 1 | 1.5-3.5 | NA<br>9<br>10<br>7 | 19 | 0.4 | 827 | - | ML | | Very dark brown (10YR 2/2) SILT, little fine to medium Sand and Clay, trace subrounded Gravel, loose, damp, no odor. Fill. | SILT |
| 5 | | 2 | 3.5-5.5 | 9<br>8<br>9<br>9 | 17 | 1.8 | 377 | - | | | Yellowish (10 YR 5/4) SILT, little fine to medium Sand, trace Clay and subangular Gravel, moderately dense, damp. Mottled with very dark brown at 3.7' bgs. Increase in Clay content at 4.5' bgs to some. | |
| | | 3 | 5.5-7.5 | 2<br>3<br>4<br>4 | 7 | 1.3 | 300 | + | CL | | Dark yellow brown (10 YR 4/4) CLAY, some Silt, little fine to medium subangular Sand, trace to few subrounded fine to medium Gravel, hard to medium stiff, no odor, damp, extensive oxidation. Clay Till. At 7.0' bgs, black oily product present : very strong odor and Clay is now brown black (10 YR2/1). At 8.7' bgs, increase in Silt content and decrease in stiffness. | CLAY |
| | 725 | 4 | 7.5-9.5 | 2<br>3<br>3<br>4 | 6 | 1.3 | 619 | + | | | | |
| | | | | | | | | | ML | | Dark grey brown (10 YR 4/2) SILT, little Clay and fine to coarse subrounded to subangular Sand, few suburounded fine to medium Gravel. Strong odor, moderately loose, damp. | SILT |
| 10 | | 5 | 9.5-11 | 3<br>5<br>12<br>7 | 17 | 1.5 | 2780 | + | SP | | Grey (10 YR 5/1) fine to coarse subangular SAND, some Silt, trace Clay, few fine to medium subrounded to subangular Gravel. Wet (saturated), strong odor, oily sheens, loose. | SAND |
| | 720 | 6 | 11.5-1 | 10<br>15<br>20<br>21 | 35 | NA | 547 | + | CL | | CLAY as above 5.7-8.9' bgs. (pp>4.5 tons/ sq. ft.), no odor, dry. Clay Till. | CLAY |
| 15 | | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; + = Positive Test Result;
NA = Not Applicable/Not Available;
Samples collected 1.5-3.5' and 7.5-9.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/07/01 | 9.7' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/07/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau / Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 561223.26<br>**Easting:** 13305657.68<br>**Casing Elevation:** 733.39<br><br>**Borehole Depth:** 13' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly / SC Kerr | **Boring ID:** RFI-16-09<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | | | | | | | | | | | |
| 0 | | | | | | | | | FL | | Concrete. | Fill |
| | | 1 | 0.7-2.7 | 8 10 9 17 | 19 | 1.7 | 1547 | - | ML | | Yellowish brown (10 YR 5/6) SILT, some fine to coarse Sand, aplastic, dense, no odor. Fill. | SILT |
| | 730 | 2 | 2.7-4.7 | 5 7 9 9 | 16 | 1.8 | 72.9 | - | | | | |
| 5 | | 3 | 4.7-6.7 | 4 2 1 1 | 3 | 1.6 | 105 | - | | | Sand content increases to a Sandy Silt. | |
| | | 4 | 6.7-8.7 | 2 2 2 3 | 4 | 1.5 | 98.7 | - | SP | | Yellowish brown (10 YR 5/6) fine to coarse subangular SAND, some SILT, few fine to medium subangular and subrounded Gravel, wet, moderately dense to moderately loose, no odor, saturated and weak odor at 6.6' bgs. Old concrete found at 8.3' bgs. | SAND |
| | 725 | | | | | | | | | | SAND as above but black and oily with strong odor. | |
| 10 | | 5 | 8.7-10 | 12 7 9 11 | 16 | 1.4 | 311 | + | CL | | Gray (10 YR5/1) CLAY, some Silt, little fine to medium subangular Sand, little fine to medium Gravel, hard, stiff, moderate odor, dry to damp. Clay Till. | CLAY |
| | | 6 | 10.7-1 | 8 17 20 21 | 37 | 1.3 | 93.9 | - | | | | |
| | 720 | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |

**Boring Construction**

- Cement pad with 9" diam. flush-mount cover.
- Grout 0.8-1' bgs.
- Bentonite holeplug seal 1-3' bgs.
- 2" ID Sch. 40 PVC riser 0.2-4.5' bgs.
- #5 Global filter sandpack 3-9.7' bgs.
- 2" ID Sch. 40 PVC 0.020" slotted screen 4.5-9.5' bgs.
- Hole plug backfill 9.7-11' bgs.
- Hole plug 11-13' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result; NA = Not Applicable/Not Available.
Samples collected 0.7-2.7' and 4.7-6.6' bgs.

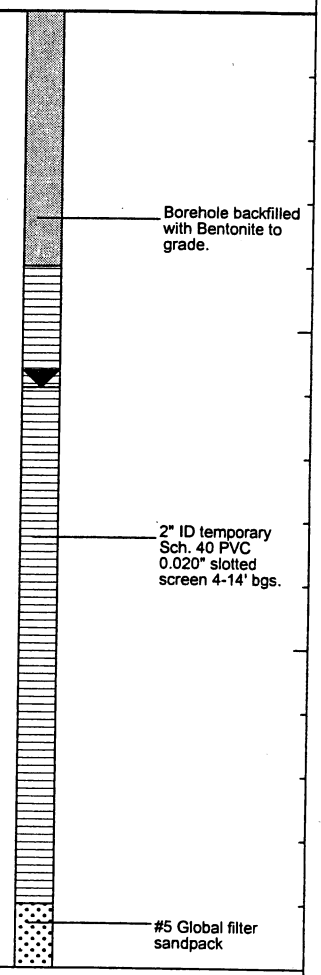
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/06/01 | 6.6' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/08/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 561230.1<br>**Easting:** 13305627.49<br>**Casing Elevation:** 736.09<br><br>**Borehole Depth:** 15' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** S. Kerr & S.M. Duly | **Boring ID:** RFI-16-10<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 735 | | | | | | | | FL | | Concrete. | Concrete |
| | | 1 | 1.2-3.2 | 8 11 12 14 | 23 | 1.5 | 487 | - | ML | | Yellow brown (10 YR 5/6) SILT, some fine Sand, trace Clay, aplastic, damp, no odor, moderately dense. Fill. | Silt |
| | | 2 | 3.2-5.2 | 15 16 23 25 | 39 | 0.9 | 602 | - | | | | |
| 5 | 730 | 3 | 5.2-7.2 | 5 6 6 4 | 12 | 1.4 | 981 | - | | | Concrete.<br>Dark grayish (10 YR 4/2) SILT, little Clay and medium to coarse rounded to subangular Gravel, few fine to medium Sand, loose to dense at 5.9' bgs, damp but wet 5.9'-6.2' bgs, some oxidation. | |
| | | 4 | 7.2-9.2 | 6 6 4 5 | 10 | 1 | 776 | + | CL | | Yellowish brown (2.5 Y 4/3) CLAY, some Silt, little fine subrounded to subangular Sand, moderately plastic, slight odor (stronger at 8.0' bgs), damp, black Staining 7.5'-8.0' bgs. At 6.5' bgs, old concrete. | Clay |
| | | | | | | | | | SP | | Grayish brown (10 YR 5/2) fine to coarse (predominantly fine) subangular SAND, some Silt, oily sheen, moderately dense to moderately loose, wet, strong odor. | Sand |
| 10 | 725 | 5 | 9.2-11 | 3 3 4 4 | 7 | 1.8 | 555 | + | ML-CL | | SILT and CLAY lenses as at 6.2'-8.7' bgs up to 4" wide. Gray (10 YR 5/1) Silt up to 3" wide, little to some Clay, moderately dense, damp, strong odor throughout. Increase in moisture content and in softness at 11.5'. | Clay and Silt |
| | | 6 | 11.2-1 | 6 9 17 25 | 26 | NA | 654 | + | SP | | SAND as above 8.7-9.5' bgs. | Sand |
| 15 | | 7 | 13.2-1 | 12 20 31 37 | 51 | 1.8 | 164 | - | CL | | Dark gray (10 YR 4/1) CLAY, some Silt, trace fine to coarse subangular Sand and coarse subangular Gravel, hard (pp>4.5), dry, odor. Clay Till. | Clay |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available.
PID background = 17.0 ppm

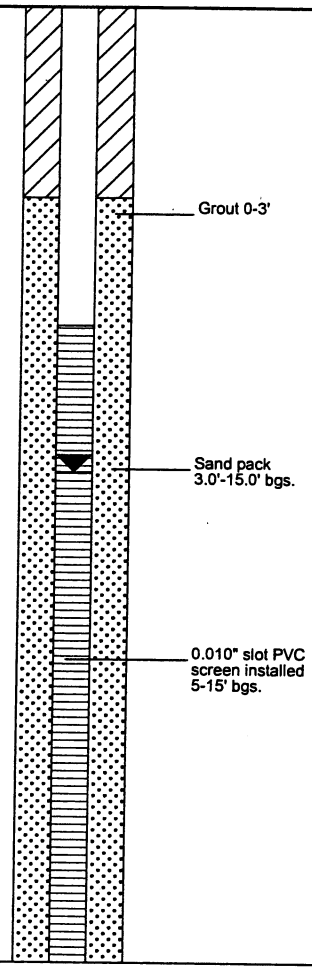
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/8/01 | 5.9' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/12/2001<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 561276.36<br>**Easting:** 13305579.26<br>**Casing Elevation:** 736.49<br><br>**Borehole Depth:** 15' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-16-11<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | |
| | 735 | 1 | 0-2 | 8 9 Ref - | N/A | 0.8 | 0.0 | - | ML | Concrete. | |
| | | | | | | | | | | Black (10YR 2/1) aplastic SILT, some to little fine to medium (predominantly fine) subangular Sand, no odor, loose, dry. | SILT |
| | | 2 | 2-4 | 6 Ref - - | N/A | 0.5 | 0.0 | - | | | |
| | | | | | | | | | FL | Concrete. | |
| | | | | | | | | | ML | Black (10YR 2/1) aplastic SILT, some to little fine to medium (predominantly fine) subangular Sand, no odor, loose, dry. | SILT |
| 5 | | 3 | 4-6 | 5 6 6 5 | 12 | 1.3 | 0.0 | - | FL | Concrete. | |
| | 730 | 4 | 6-8 | 5 Ref - - | N/A | 0.5 | 0.1 | - | ML | Black (10YR 2/1) aplastic SILT, locally oxidized to dark yellow brown (10YR 4/4), damp, moist at 6.8' bgs, saturated at 7.3' bgs. | SILT |
| | | | | | | | | | FL | Concrete. | |
| | | 5 | 8-10 | 3 5 6 8 | 11 | 1.6 | 0.0 | - | CL | Brown (10YR 5/3) to (5/1) moderately stiff CLAY, some Silt, little fine to medium subangular to subrounded Sand, trace fine to medium rounded to subrounded Gravel, no odor, damp, locally oxidized and mottled to brown (10YR 5/3). Till. | CLAY and SILT |
| 10 | | | | | | | | | | | |
| | 725 | 6 | 10-12 | 3 3 3 3 | 6 | 1.8 | 0.0 | - | ML | Yellow brown (10YR 5/4) aplastic SILT, some fine subangular Sand, no odor, saturated, moderately dense. | |
| | | | | | | | | | CL | Brown (10YR 5/3) to (5/1) moderately stiff CLAY. | |
| | | 7 | 12-14 | 12 13 17 28 | 30 | 2.0 | 0.0 | - | | Yellow brown (10YR 5/4) Sandy CLAY, some Silt and fine to medium subrounded to subangular Sand, no odor, saturated, soft, increased coarseness and more gray with depth. | |
| | | | | | | | | | | Brown (10YR 5/3) to (5/1) moderately stiff CLAY, no odor, dry. | |
| | | 8 | 14-15 | N/A N/A | N/A | N/A | N/A | N/A | | | |
| 15 | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
PID background = 0.0 ppm
NA=Not Available
Samples collected 1-3' and 5-7' bgs.

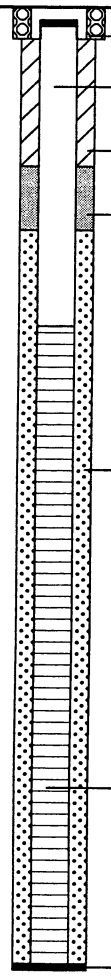
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/12/01 | 7.3(?) | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/31/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Glen Rau<br>**Drilling Method:** Geoprobe<br>**Sampler Size:** NA<br>**Auger Size:** NA<br>**Rig Type:** Truck-Mounted Geoprobe | **Northing:** 561130.69<br>**Easting:** 13305740.14<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 735.58<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-16-12<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | FL | | CONCRETE. | FILL |
| | | | | | 0.0 | + | SM | | Very dark brown (10YR) fine to coarse subangula well-graded SAND, little Silt, few Clay, aplastic, weak odor, dry, dense. Foundry Sand. | SAND |
| | | 1 | 0-4 | 2.5 | | | CL | | Brown (10YR 5/3) Silty Lean CLAY, few fine to coarse subangular to subrounded Sand, very stiff, weakly plastic, weak odor, dry. Clay Till. | ILTY CLA |
| | | | | | 378 | + | FL | | Weathered CONCRETE. | |
| | | | | | | | CL | | Silty Lean CLAY as above from 1.9' - 3.1' bgs, but more plastic, moist, and dark brown (10YR), moderate odor. | SILTY CLAY |
| 5 | 5 | | | | 432 | + | | | | |
| | | 2 | 4-8 | 3.3 | | | ML | | Dark yellow-brown (10YR) SILT, little fine to coarse subrounded Sand, little Clay, aplastic, moderate odor, dense, moist to damp. Strong odor, oily material present at 6.0' - 6.5' bgs. | SILT |
| | | | | | 563 | + | | | | |
| | | | | | | | SM | | Gray (10YR 5/1) fine to coarse subangular Silty well-graded SAND, few Clay, wet to moist, loose, moderate odor, fines downward. | |
| | | | | | 967 | + | CL | | Brown (10YR 5/2) to gray (10YR 5/1) Silty Lean CLAY as above from 3.5' - 5.4' bgs, moderate odor, dry to damp. Glacial Till. | SILTY CLAY |
| 10 | 10 | 3 | 8-12 | 4.0 | | | | | | |
| | | | | | 1753 | + | | | | |
| | | | | | 1862 | + | SM | | Silty SAND as above from 8.3' - 9.0' bgs. Saturated, oil present. | SILTY SAND |
| | | 4 | 12-16 | 4.0 | | | | | | |
| 15 | 15 | | | | 1973 | + | CL | | Gray (10YR 5/1) Silty Lean CLAY as above from 3.5' - 5.4' bgs, very stiff. | SILTY CLAY |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.9-2.9' and 8.9-10.9' bgs.
+ = Positive Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/04/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS Shive<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 11' bgs.<br>**Surface Elevation:** NA<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-16-13<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | Concrete. | FILL | |
| | | 1 | 1-3 | 9<br>11<br>13<br>12 | 24 | 1.3 | NA | NA | ML | | Black (10YR 2/1) SILT, trace Clay, little fine Sand, no odor, loose, dry. Fill.<br>Yellow-brown (10YR 5/6) fine SAND lenses.<br>2.8-3.0' bgs: trace fine to medium Gravel. | SILT | |
| | | 2 | 3-5 | 10<br>14<br>16<br>11 | 30 | 1.2 | NA | NA | | | | | |
| 5 | 5 | 3 | 5-7 | 6<br>6<br>9<br>7 | 15 | 1.5 | NA | NA | | | Becomes moderately dense. | | Borehole backfilled with bentonite to grade. |
| | | | NA | NA | NA | NA | NA | NA | FL | | Concrete.<br>Aggregate. | FILL | |
| 10 | 10 | 4 | 9-11 | 3<br>3<br>4<br>3 | 7 | 1.3 | NA | NA | CH | | Grayish brown (10YR 5/2) to yellow-brown (10YR 5/6) mottled fat CLAY, trace fine Sand, trace Silt, no odor, soft, moist. | CLAY | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = not available
Samples collected 1-3' and 9-11' bgs.
Drilled with Shive.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 10/31/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compau/D. Emery<br>**Drilling Method:** Geoprobe<br>**Sampler Size:** NA<br>**Auger Size:**<br>**Rig Type:** Truck-Mounted Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** BTL | **Boring ID:** RFI-16-14<br><br>**Client:** General Motors<br><br>**Location:** Tank 113/114/115 Investigation<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | NA | NA | NA | NA | NA | Fill | | CONCRETE. | Fill | Boring backfilled with bentonite to grade. |
| | | | | | | | | | Yellow-brown SILT, some fine Sand, trace Clay, no odor, moderately dense, dry. Fill. | | |
| 5 | 5 | | | | | | ML | | Dark grayish-brown (10YR 1/2) SILT, little Clay, little rounded to subrounded medium to coarse Gravel, few fine to medium Sand, loosr to dense, dry. | SILT | |
| | | | | | | | SP | | Yellow-brown fine to medium SAND, trace Silt, moderately dense, moist. | SAND | |
| 10 | 10 | | | | | | | | As above with Silt and trace Clay. | | |
| | | | | | | | | | Grayish-brown medium to coarse SAND, saturated, very strong hydrocarbon odor, oily, sheen. | SAND | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
No samples collected for analysis.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 10/31/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compau/D. Emery<br>**Drilling Method:** Geoprobe<br>**Sampler Size:** NA<br>**Auger Size:**<br>**Rig Type:** Truck-Mounted Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** BTL | **Boring ID:** RFI-16-15<br><br>**Client:** General Motors<br><br>**Location:** Tank 113/114/115 Investigation<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | NA | NA | NA | NA | NA | Fill | | CONCRETE. | SAND and FILL | |
| | | | | | | | | | Yellow-brown fine SAND, medium density. | | |
| | | | | | | | | | CONCRETE. | | |
| | | | | | | | | | Black Sandy FILL with Cinder and Brick fragments. | | |
| | | | | | | | | | VOID. | | |
| 5 | 5 | | | | | | | | | | Temporary 1" diam. PVC 0.010" slot screen installed from 7-12' bgs. |
| | | | | | | | SP | | Brown fine SAND with Silt. | SAND | |
| | | | | | | | | | Light brown fine SAND with Silt, moist to wet. | | |
| | | | | | | | | | As above, with rounded Gravel, wet to saturated. | | |
| 10 | 10 | | | | | | ML | | Light brown Sandy SILT to Clay. | SAND & SILT | |
| | | | | | | | | | Brown SILT, with trace fine Sand, stiff. | SILT | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Installed a 1-inch temporary PVC Well from 7' - 12' bgs.
bgs = below ground surface;
NA = Not Applicable/Not Available.
No water sample collected, dry.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 10/31/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:**<br>**Drilling Method:** Geoprobe<br>**Sampler Size:** NA<br>**Auger Size:**<br>**Rig Type:** Truck-Mounted Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 7.5' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** BTL | **Boring ID:** RFI-16-16<br><br>**Client:** General Motors<br><br>**Location:** Tank 113/114/115 Investigation<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | NA | NA | NA | NA | NA | Fill | | CONCRETE. | FILL | Boring backfilled with bentonite to grade. |
| | | | | | | | | | VOID. Physical observation: Open space under Concrete. | | |
| 5 | 5 | | | | | | | | Yellowish-brown SAND with Silt, trace Clay, trace subrounded to subangular Gravel. Fill. | SAND | |
| | | | | | | | | | Black Coal CINDER. | | |
| | | | | | | | | | Yellowish-brown SAND with Silt, trace Clay, trace subrounded to subangular Gravel. Fill. | | |
| 10 | 10 | | | | | | | | Concrete obstruction/Refusal at 7.5' bgs. Possible former basement/tunnel. | | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
No soil samples collected

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 10/31/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compau/D. Emery<br>**Drilling Method:** Geoprobe<br>**Sampler Size:** NA<br>**Auger Size:**<br>**Rig Type:** Truck-Mounted Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** BTL | **Boring ID:** RFI-16-17<br><br>**Client:** General Motors<br><br>**Location:** Tank 113/114/115 Investigation<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | NA | NA | NA | NA | NA | | | CONCRETE. | FILL | |
| | | | | | | | | | Yellow-brown fine to medium SAND, some Silt. [FILL] | SAND | |
| 5 | 5 | | | | | | SM | | Dark brown Silty SAND, with subangular Gravel. | SILTY SAND | |
| | | | | | | | CL | | Brown CLAY, with Sand and Silt, trace subangular to subrounded Gravel, no odor. | CLAY | Boring backfilled with bentonite to grade. |
| | | | | | | | SM | | As above from 4.0' - 5.6' bgs. | | |
| | | | | | | | CL | | As above from 5.6' - 6.4' bgs. | | |
| | | | | | | | | | As above from 4.0' - 5.6' bgs. | | |
| 10 | 10 | | | | | | SM | | Brown Silty SAND, soft, moist to wet. | SILTY SAND | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Installed a 1-inch PVC Temporary well from 7' - 12' bgs.
bgs = below ground surface;
NA = Not Applicable/Not Available.
No water sample collected, dry.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 10/31/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compau/D. Emery<br>**Drilling Method:** Geoprobe<br>**Sampler Size:** NA<br>**Auger Size:**<br>**Rig Type:** Truck-Mounted Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 7.3' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** BTL | **Boring ID:** RFI-16-18<br><br>**Client:** General Motors<br><br>**Location:** Tank 115 Investigation<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | NA | NA | NA | NA | NA | Fill | | ASPHALT. | FILL | |
| | | | | | | | | | Red CINDER. | | |
| | | | | | | | | | CONCRETE. | | |
| | | | | | | | SP | | Yellow-brown SAND, to Clay, medium dense, dry, no odor. | SAND and FILL | |
| | | | | | | | ML | | Brown Clayey SILT, trace fine Sand, no odor. | | |
| | | 1 | 1.2-4.0 | 2.0 | NA | NA | SP | | Dark brown fine to medium SAND, trace Silt. | | |
| | | | | | | | | | Brown fine to medium SAND, trace subangular to subrounded Gravel, moist. | | |
| | | | | | | | | | WOOD. | | |
| 5 | 5 | | | | | | | | Dark brown fine to medium SAND with Silt, trace subangular to subrounded Gravel, moist to wet. | | |
| | | 2 | 4.0-7.3 | 3.0 | NA | NA | SM | | Dark gray-brown Silty SAND, with subangular Gravel, wet. | SILTY SAND | Boring backfilled with bentonite to grade |
| | | | | | | | | | Refusal at 7.3' bgs. | | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 10/31/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compau/D. Emery<br>**Drilling Method:** Geoprobe<br>**Sampler Size:** NA<br>**Auger Size:**<br>**Rig Type:** Truck-Mounted Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** BTL | **Boring ID:** RFI-16-19<br><br>**Client:** General Motors<br><br>**Location:** Tank 115 Investigation<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | NA | NA | NA | NA | NA | Fill | | ASPHALT.<br>CONCRETE.<br>Dark brown Silty SAND with large subrounded Gravel. Fill. | Fill | |
| 5 | 5 | | | | | | SP | | Yellow-brown fine SAND, medium dense, dry. | SAND | Boring backfilled with bentonite to grade |
| | | | | | | | CL | | Yellow-brown Sandy CLAY to subrounded to subangular Gravel, moist. | | |
| | | | | | | | ML | | Gray-brown SILT with yellow-brown Sand mottles, trace rounded Gravel. | SILT | |
| | | | | | | | CL | | As above from 6.0' - 6.3' bgs. | | |
| | | | | | | + | ML | | Brown-gray SILT with 0.5' subangular Gravel, very dense, very strong hydrocarbon odor. | SILT | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** + = Positive Test Result;
bgs = below ground surface;
NA = Not Applicable/Not Available.

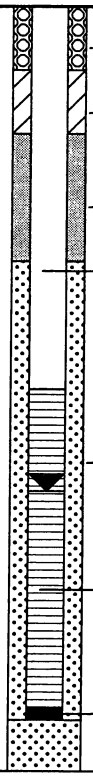
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/04/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12' bgs.<br>**Surface Elevation:** NA<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-16-20<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | NA | NA | NA | NA | NA | NA | FL | | CONCRETE. | Fill |
| | | | | | | | | | | | Aggregate FILL. | |
| | | 1 | 1-3 | 2<br>3<br>3<br>11 | 6 | 1.3 | NA | NA | SW | | Very dark grayish brown (10YR 3/2) SAND, predominantly fine to coarse, some Silt, trace Clay, no odor, loose, damp. Fill. | |
| | | | | | | | | | CH | | Dark grayish brown (10YR 4/2) fat CLAY, trace Silt, fine Sand, no odor, soft, moist. | |
| | | | | | | | | | SP | | Very dark grayish brown (10YR 3/2) SAND, predominantly medium, poorly graded, some Silt, trace Clay, no odor, loose, damp. Fill. | |
| | | | NA | NA | NA | NA | NA | NA | FL | | CONCRETE. | |
| 5 | 5 | 2 | 4-6 | 3<br>3<br>3<br>3 | 6 | 1.6 | NA | NA | ML | | Yellow-brown (10YR 5/6) SILT, some fine to medium Sand, no odor, loose, moist. | Silt |
| | | 3 | 6-8 | 1<br>2<br>2<br>1 | 4 | 0.8 | NA | NA | | | Saturated.<br>7.8-8.0: Some coarse subangular Gravel. | |
| | | 4 | 8-10 | 1<br>2<br>1<br>1 | 3 | 1.5 | NA | NA | | | | |
| 10 | 10 | 5 | 10-12 | 1<br>1<br>1<br>1 | 2 | 0.9 | NA | NA | | | Some medium grained Sand and fine to medium subrounded Gravel. | |
| | | | | | | | | | CH | | Brown (10YR 5/3) Silty fat Clay, some fine to medium subrounded to subangular Sand, no odor, soft, moderate plasticity, saturated. | Clay |
| 15 | 15 | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = not available
Samples collected 1-3' and 4-6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 12/04/01 | 7.6' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/04/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 3.5' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-16-21<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | NA | NA | NA | NA | NA | NA | FL | | CONCRETE. | Fill | Borehole backfilled with bentonite to grade. |
| | | 1 | 1-3 | NA | NA | NA | NA | NA | | | Aggregate, FILL.<br>CONCRETE (spoon refusal at 1.0' bgs). | | |
| | | | NA | NA | NA | NA | NA | NA | | | | | |
| 5 | 5 | | | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = not available

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

Project: 644.10.039 Template: j:\rockware\logplot2001\logfiles\64410\auger_well2.ldf
Data File:j:\rockware\logplot2001\logfiles\64410\RFI-16-21.dat Date: 12/26/01

| | | |
|---|---|---|
| **Date Start/Finish:** 10/31/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compau/D. Emery<br>**Drilling Method:** Geoprobe<br>**Sampler Size:** NA<br>**Auger Size:**<br>**Rig Type:** Truck-Mounted Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** BTL | **Boring ID:** RFI-16-22<br><br>**Client:** General Motors<br><br>**Location:** Tank 113/114/115 Investigation<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | NA | NA | NA | NA | NA | Fill | | CONCRETE. | FILL | Boring backfilled with bentonite to grade |
| | | | | | | | | | Yellowish-brown fine to medium SAND, medium density, no odor. | SAND | |
| 5 | 5 | | | | | | | | Grayish-brown SILT, trace Clay to Sand, trace subrounded to subangular Gravel. | | |
| | | | | | | | | | Black CINDER, with Sand and Silt, some subrounded Gravel. | | |
| | | | | | | | ML/CL | | Dark brown to black SILT and CLAY, some subangular Gravel, dense, moist. | | |
| | | | | | | | CL | | Brown CLAY with gray mottles throughout, trace fine Sand, trace subrounded Gravel, stiff. No mottles from 9.0' - 12' bgs. | CLAY | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Temp well installed, but no water sample collected, dry.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 10/31/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compau/D. Emery<br>**Drilling Method:** Geoprobe<br>**Sampler Size:** NA<br>**Auger Size:**<br>**Rig Type:** Truck-Mounted Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** BTL | **Boring ID:** RFI-16-23<br><br>**Client:** General Motors<br><br>**Location:** Tank 113/114/115 Investigation<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | NA | NA | NA | NA | NA | NA | NA | | | CONCRETE. | FILL | Boring backfilled with bentonite to grade. |
| | | | | | | | | | Fill | | Yellow-brown Silty SAND, trace Clay, no odor, moderately dense. Fill. | SILTY SAND | |
| | | | | | | | | | | | Brown Silty SAND, with angular Gravel, trace Clay, loose. | | |
| 5 | 5 | | | | | | | | | | Dark brown to black CINDER, very loose. | FILL | |
| | | | | | | | | | ML | | Black SILT, trace Sand, trace rounded Gravel. | SILT | |
| | | | | | | | | | CL | | Dark gray to black CLAY with Silt, trace Sand and subrounded to subangular Gravel, stiff. | CLAY | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/16/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2' cont acetate sleeve<br>**Auger Size:** 2 1/4"<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 560809.81<br>**Easting:** 13306491.7<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** 721.2<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-17-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | FL | | ASPHALT. | FILL | |
| | | | | | | | | | CONCRETE. | | |
| | 720 | 1 | 0-2 | 1.1 | 12.9 | - | SP | | Black (10YR 2/1) fine Silty SAND, trace Clay, trace rounded subangular and angular Gravel, dense, no odor, moist. Fill. | SILTY SAND | Borehole backfilled with Bentonite to grade. |
| | | 2 | 2-4 | 1.6 | 34.7 | - | | | | | |
| | | | | | | | SM | | Very dark grayish-brown fine to medium Silty SAND, trace shiny black fragments, dense, moist. Fill. | | |
| 5 | | 3 | 4-6 | 1.7 | 20.7 | - | ML | | Yellowish-brown (10YR 5/4) SILT, little Clay, trace Brick-like fragments, dense, no odor, moist. Fill. | SILT | |
| | | | | | | | | | Brown (10YR 4/3) SILT, trace fine Sand and brick-like fragments, dense, no odor, moist. Fill. | | |
| | 715 | 4 | 6-8 | 2.0 | 20.3 | - | | | Brown (10YR 4/3) Sandy SILT, medium to coarse Sand, trace Clay, moderate dense, no odor, saturated at 5.8' bgs. | SILT | |
| | | | | | | | | | Yellowish-brown (10YR 5/4) SILT, trace Clay and subrounded to subangular Gravel, aplastic, dense, no odor. | | |
| | | 5 | 8-10 | 2.0 | 32.7 | - | | | | | |
| 10 | | | | | | | | | Dark gray (10YR 4/1) SILT, hard, dense, no odor, moist. | | |
| | 710 | 6 | 10-12 | 2.0 | 44.9 | - | | | | | |
| | | 7 | 12-14 | 1.0 | 36.3 | - | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.7-2' and 2-4' bgs.
1" Temporary Well set at 10' bgs.

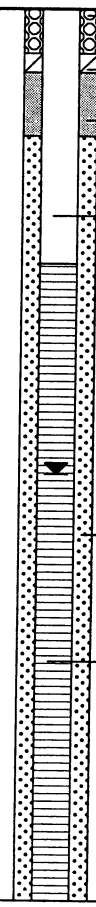
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/16/01 | 5.8' | NA |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/14/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID SS<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 560485.56<br>**Easting:** 13306346.96<br>**Casing Elevation:** 720.27<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** S.M. Duly | **Boring ID:** RFI-17-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 720 | | | - | | | | | FL | | CONCRETE/ASPHALT. | |
| | | 1 | 0-2 | 6<br>7<br>7 | 13 | 1.0 | 3.0 | - | ML | | Very dark gray-brown (10YR 2/2) SILT, some fine to coarse subangular SAND, little fine to coarse angular to subangular Gravel, aplastic, no odor, dry, loose. | SILT |
| | | 2 | 2-4 | 5<br>5<br>3<br>7 | 8 | 0.0 | NA | NA | | | No Recovery, pebble- to cobble-sized fragments in shoe. | |
| 5 | 715 | 3 | 4-6 | 4<br>2<br>8<br>5 | 10 | 1.8 | 2.9 | - | CL | | Brown (10YR 5/3) Silty CLAY, little fine to medium subangular Sand, no odor, damp, medium stiff to soft. (pp = 1 - 3.5 ton/square ft). | SILTY CLAY |
| | | 4 | 6-8 | 3<br>2<br>2<br>1 | 4 | 1.8 | 2.4 | - | SP | | Brown-yellow (10YR 6/6) fine to coarse subangular SAND, little to some Silt, few Clay and fine to coarse subrounded Gravel, no odor, moist, moderately loose, saturated at 7.3' bgs. | SAND, fINE |
| | | 5 | 8-10 | 1<br>2<br>2<br>1 | 4 | 1.0 | 2.3 | - | | | | |
| 10 | 710 | 6 | 10-12 | 1/<br>12"<br>1/6" | NA | 1.0 | 4.5 | - | | | | |
| | | 7 | 12-14 | 1<br>1<br>1<br>1 | 2 | 0.8 | 0.8 | - | | | | |
| 15 | 705 | | | | | | | | | | | |

**Boring Construction**



- Cement pad with 9" diam. flush-mount cover.
- Grout 0.7-1' bgs.
- Bentonite holeplug seal 1-2' bgs.
- 2" ID Sch. 40 PVC riser 0.3-4' bgs.
- #5 Global filter sandpack 2-14' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 4-14' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
pp=pocket penetrometer.
Samples collected 0.3-2' and 4-6' bgs.

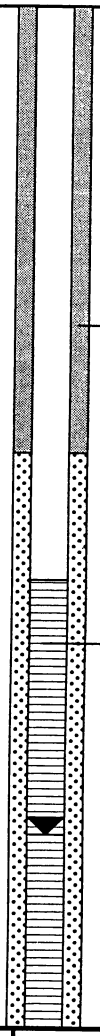
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/14/01 | 7.3' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06-25-01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 563862.36<br>**Easting:** 13305829.93<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 744.46<br><br>**Descriptions By:** SC Kerr | **Boring ID:** RFI-21-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 14<br>50/3<br>N/A<br>N/A | NA | 0.8 | >9999 | - | FL | | Concrete | FILL |
| | | | | | | | | | SP | | Yellow brown (10YR 5/4) fine to medium SAND, trace Clay, few Silt, loose, dry, no odor. | SAND |
| | | 2 | 2-4 | 13<br>13<br>3<br>9 | 16 | 1.4 | 329 | - | ML | | Black (10YR 2/1) SILT, some Clay and fine to medium Sand, moist, slag, no odor. | SILT |
| | | | | | | | | | | | Very dark grayish brown (10YR 4/2) SILT, some fine to medium Sand, Clay, and concrete rubbles and slag, moderately loose, no odor. | |
| | 740 | 3 | 4-6 | 8<br>5<br>5<br>3 | 10 | 1.5 | >9999 | - | SP | | Yellow brown (10YR 5/6) fine to medium SAND, some Silt, little Clay, loose to moderate dense, moist, no odor. | |
| 5 | | | | | | | | | ML | | Blac(k10YR 2/1) clayey SILT, little fine to coarse Sand, loose, moist, no odor. | |
| | | 4 | 6-8 | 2<br>2<br>3<br>4 | 5 | 1.5 | 1336 | - | | | Very dark grayish brown (10YR 3/2) SILT, little fine to medium Sand, trace coarse Gravel, moderate dense, moist, no odor. | |
| | | | | | | | | | | | Dark yellow brown (10YR 4/6) SILT, some fine to medium Sand, trace subangular to subrounded coarse Sand, moderate dense, moist, no odor. From 8.2' bgs, sand decreases to little and some clay, dense, wet at 8.5' bgs. | |
| | | 5 | 8-10 | 3<br>3<br>5<br>5 | 8 | 1.3 | 1454 | - | | | | |
| | 735 | | | | | | | | | | | |
| 10 | | 6 | 10-12 | 2<br>5<br>7<br>8 | 12 | 1.2 | 97.8 | - | SP | | Yellow brown (10YR 5/6) fine to medium SAND, wet, loose, no odor, saturated at 10.4' bgs. | SAND |
| | | 7 | 12-14 | 5<br>7<br>8<br>14 | 15 | 1.4 | 197 | - | | | | |
| | 730 | | | | | | | | | | | |
| 15 | | 9 | 14-16 | 4<br>4<br>6<br>7 | 10 | 1.6 | 81.6 | - | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.9-2.9' and 6.9-8.9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/25/01 | 10.4 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-21-01

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 16-18 | 14<br>24<br>50/5 | NA | 2 | 1123 | - | SP | | Yellow brown (10YR 5/6) fine to medium SAND, wet, loose, no odor, saturated at 10.4' bgs. | SAND | Sand backfill from 9' to 19' bgs. |
| | | | | | | | | | ML | | Yellow brown (10YR 5/6) SILT, some fine Sand, dense, saturated, no odor. | SILT | |
| 20 | 725 | | | | | | | | | | | | |
| 25 | 720 | | | | | | | | | | | | |
| 30 | 715 | | | | | | | | | | | | |
| 35 | 710 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.9-2.9' and 6.9-8.9' bgs.

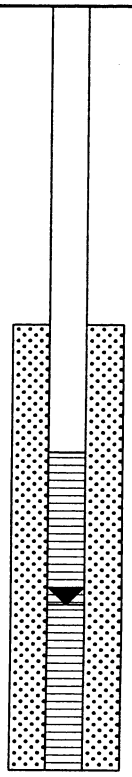
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/25/01 | 10.4 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06-25-01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 563730.77<br>**Easting:** 13305844.54<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 13' bgs<br>**Surface Elevation:** 745.26<br><br>**Descriptions By:** SC Kerr | **Boring ID:** RFI-21-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | | 6 | | | | | FL | | Concrete | FILL |
| | | 1 | 0-2 | 14<br>16<br>13 | 30 | 1.5 | 94.8 | - | ML | | Black (10YR 2/1) SILT, some Clay, some fine to medium Sand, rubbles and slag, dense, moist, no odor. Fill. | SILT |
| | | 2 | 2-4 | 12<br>50/<br>0.4<br>- | 50 | 0.7 | 2116 | - | | | | |
| 5 | 740 | 3 | 4-6 | 14<br>12<br>6<br>3 | 18 | 1.3 | >9999 | - | | | | |
| | | 4 | 6-8 | 2<br>5<br>3<br>3 | 6 | 1.6 | >9999 | - | SM | | Yellow brown (10YR 5/4) fine to coarse SAND (predominantly fine grained), some Silt, rubble and slag, little Clay, moderately loose, moist, no odor. | SAND |
| | | | | | | | | | ML | | Brown (10YR 4/3) SILT, some fine Sand, moist to wet, dense, no odor. | SILT |
| | | 5 | 8-10 | 3<br>4<br>4<br>5 | 8 | NA | 1109 | - | SP | | Yellow brown (10YR 5/4) fine to coarse SAND, no rubble or slag, moist to wet, predominantly coarse SAND from 8.6' downward, trace coarse Gravel, saturated at 9.4', less coarse sand, fine to medium sand predominated. | SAND |
| 10 | 735 | 6 | 10-12 | 5<br>2<br>4<br>7 | 6 | 1.8 | 1522 | - | | | | |
| | | 7 | 12-13 | NA | NA | NA | NA | NA | CL | | Grayish brown CLAY, stiff, (pp>4.5 tons/sq. ft.), trace fine to coarse subangular Sand, little Silt. | CLAY |
| 15 | 730 | | | | | | | | | | | |

**Boring Construction**



Temporary 1" well screen set at 7' to 12' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.7-2.7' and 6.7-8.7' bgs.
pp = pocket penetrometer

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/25/01 | 9.4' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/21/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2x2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 563730.47<br>**Easting:** 13305910.02<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 21' bgs<br>**Surface Elevation:** 744.99<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-21-03<br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | 1 | 0-2 | 1.5<br>n/a<br>n/a<br>n/a | NA | 0.5 | 70.5 | - | FL | | Asphalt | FILL | |
| | | 2 | 2-4 | 20<br>29<br>50/<br>3" | NA | 1.2 | 340 | + | ML | | Very dark gray brown SILT. Some fine to coarse subangular Sand. Little Clay and Gravel. Loose, dry, slight odor. Fill. | SILT | Borehole backfilled with Bentonite to grade. |
| 5 | 740 | 3 | 4-6 | 5<br>8<br>9<br>6 | 17 | 1.9 | 195 | + | | | Dark yellow SILT with some black staining. Little Clay. Trace fine Sand. Loose, no odor. Becomes damp at 5.9' bgs and denser at 6.2' bgs. | | |
| | | 4 | 6-8 | 3<br>2<br>2<br>2 | 4 | 1.6 | 63.3 | - | | | | | |
| | | 5 | 8-10 | 6<br>3<br>2<br>1 | 5 | 1.0 | 187 | - | | | Grayish brown (10 YR 5/2) fine to medium subangular SAND. Trace rubble and wood debris. Loose, damp, no odor.<br>Dark grayish brown ( 10 YR 4/2) SILT. Some fine Sand. Little Clay. Trace Gravel. Damp, no odor. Local oxidation at 10' bgs. Increase in Clay content at 10.8'. | | |
| 10 | 735 | 6 | 10-12 | 3<br>4<br>8<br>11 | 12 | 5 | 118 | - | | | | | |
| | | 7 | 12-14 | 3<br>8<br>11<br>14 | 19 | 1.3 | 114 | - | SM | | Yellow brown (10 YR 5/6) fine SAND. Some Silt. Moderately dense, saturated, no odor. Increase in Silt content at 14.0' (up to SILTY SAND). Local oxidation at 14.8' bgs. Some Silt at 14.9' bgs. Trace Silt at 16.4' bgs to some. | SAND | Screen from 10' to 20' bgs. |
| 15 | 730 | 8 | 14-16 | 6<br>8<br>11<br>13 | 19 | 1.2 | 165 | - | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result;
NA = Not Applicable/Not Available
PID Background : 0.0 ppm
Samples collected 1-3' and 9-11' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/21/01 | 11.7' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-21-03

**Borehole Depth:** 21' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 4 4 8 10 | 12 | 1.4 | 118 | - | SM | | Sand as above (12'-16' bgs). | SAND | Screen from 10' to 20' bgs. |
| | | 10 | 18-20 | 7 9 17 20 | 28 | 2.0 | 98.1 | NA | | | | | |
| 20 | 725 | 11 | 20-21 | NA | NA | NA | NA | NA | ML | | Gray (10 YR 6/1 )SILT. Dense, saturated, no odor. | SILT | |
| 25 | 720 | | | | | | | | | | | | |
| 30 | 715 | | | | | | | | | | | | |
| 35 | 710 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result;
NA = Not Applicable/Not Available
PID Background : 0.0 ppm
Samples collected 1-3' and 9-11' bgs.

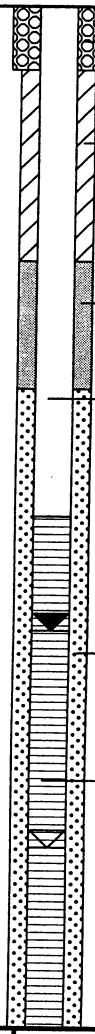
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/21/01 | 11.7' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/6/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2x2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 563671.83<br>**Easting:** 13305910.03<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 746.1<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-21-04<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | FL | | Asphalt | FILL |
| | 745 | 1 | 1-3 | 8<br>32<br>50/<br>8" | NA | 1 | 2.1 | NA | ML | | Black (10YR 2/1) SILT, trace fine Sand, trace Clay, no odor, loose, dry. Fill. | |
| | | 2 | 3-5 | 6<br>8<br>8<br>9 | 16 | 1.5 | 0.0 | NA | | | Concrete fragments to 3' bgs. | |
| 5 | 740 | 3 | 5-7 | 4<br>5<br>5<br>5 | 10 | 1.4 | 0.0 | NA | | | Damp. | |
| | | 4 | 7-9 | 4<br>5<br>11<br>16 | 16 | 1.2 | 0.0 | NA | | | Some Slag, metallic-type fragments and debris (some oxidized), plaster-like debris. | |
| 10 | | 5 | 9-11 | 1<br>2<br>2<br>1 | 4 | 1.4 | 0.0 | NA | | | Moist. | |
| | 735 | 6 | 11-13 | 2<br>3<br>7<br>9 | 10 | 1.5 | 0.0 | NA | CL | | Gray (10YR 5/1) Silty lean CLAY, trace fine Sand, no odor, loose, low plasticity, saturated. | SILTY CLAY |
| | | | | | | | | | | | Gray (10YR 5/1) and yellow-brown (10YR 5/4) mottled lean CLAY, no odor, stiff, dry. | CLAY |
| | | 7 | 13-15 | 4<br>6<br>6<br>7 | 12 | 1.5 | 0.0 | NA | SP | | Light brownish gray (10YR 6/2) predominantly fine to medium poorly graded SAND, trace Silt, no odor, loose, saturated. | SAND |
| 15 | | 8 | 15-17 | 2<br>2<br>2 | 4 | 1.3 | 0.0 | NA | | | 14': Yellow-brown (10YR 5/4) fine SAND (SW), some Silt, no odor, loose, saturated. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
PID Background : 0.8 ppm
Samples collected 0.7-2.7', 6.7-8.7' and 10.7-12.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/6/01 | 9.8' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-21-04

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | 8 | 15-17 | 4 | 4 | 1.3 | 0.0 | NA | CH | | Yellow-brown (10YR 5/4) fat CLAY seams, soft, plastic, saturated. | SAND | #5 Global Filter Pack 8-19' bgs |
| | | 9 | 17-19 | 5<br>5<br>6<br>7 | 11 | 1.4 | 0.0 | NA | SP | | Yellow-brown (10YR 5/4) predominantly medium SAND, some coarse Sand. | | Slot 0.010 Machined PVC 8-18' bgs |
| | | | | | | | | | | | Yellow-brown (10YR 5/4) predominantly fine SAND, some Silt. | | PVC Cap 18-18.2' bgs |
| 20 | 725 | | | | | | | | | | | | |
| 25 | 720 | | | | | | | | | | | | |
| 30 | 715 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
PID Background : 0.8 ppm
Samples collected 0.7-2.7', 6.7-8.7' and 10.7-12.7' bgs.

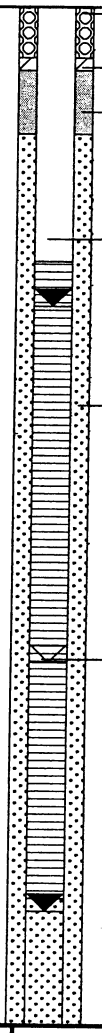
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/6/01 | 9.8' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/22/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 13305476.15<br>**Easting:** 563013.36<br>**Casing Elevation:** 742.19<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-23-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 1 2 1 1 | 3 | 1.0 | 2.5 | + | SW | | Yellow-brown (10 YR 5/4) fine subangular SAND, little to some Silt, few Clay, aplastic, earthy odor present, moist from rainfall, moderately loose. Organic matter such as roots present - topsoil mixed with fill.<br>As above, black (10 YR 2/1). | SAND |
| | 740 | 2 | 2-4 | 11 2 2 1 | 4 | 0.7 | 2.6 | - | FL | | Concrete rubble. | FILL |
| 5 | | 3 | 4-6 | 4 4 5 5 | 9 | 0.8 | 2.9 | - | CL<br>ML<br>SP<br>CL | | Yellow-brown (10 YR 5/4) Silty CLAY, little fine to medium subangular Sand, no odor, moist, soft (pp=0.5 tons/sq. feet).<br>Yellow-brown (10 YR 5/4) SILT, little Clay, little fine to medium subangular Sand, aplastic, no odor, wet, dense.<br>Brown (10 YR 4/3) fine to coarse subangular SAND, little to some Silt, aplastic, no odor, wet, moderately loose. | |
| | 735 | 4 | 6-8 | 4 5 5 7 | 10 | 1.8 | 3.2 | - | SP | | Silty CLAY, as at 4.7-5.1' bgs.<br>SAND, as at 5.1-5.5' bgs. | SAND |
| 10 | | 5 | 8-10 | 2 3 6 7 | 9 | 1.5 | 1.9 | - | CL | | Yellow-brown (10 YR 5/4) CLAY, some Silt, little fine to medium subrounded to subangular Sand, few fine to coarse rounded Gravel, no odor, dry to damp, moderately stiff (pp=2.5 tons/sq. feet). Clay Till. At 8.5': dark gray (10 YR 4/1), with decreased oxidation, (pp=2.5 tons/sq. feet). | CLAY |
| | 730 | 6 | 10-12 | 2 3 4 4 | 7 | 2.0 | 3.4 | - | SP | | SAND seam as at 5.1-5.5' bgs, wet, clay on selvages to 2" is locally oxidized. | |
| | | 7 | 12-14 | 2 3 5 5 | 8 | 2.0 | 2.9 | - | CL | | Homogeneous gray CLAY, as above, stiff (pp=3.0 tons/sq. feet). Clay Till. Local increases in silt to a Silty CLAY, in intermittent lenses up to 1" wide. | CLAY |
| 15 | | 8 | 14-16 | 4 7 13 17 | 20 | 2.0 | 4.2 | - | | | Gray (10 YR 5/1) fine to coarse subangular Sandy CLAY to Sand with CLAY, some Silt, few fine to coarse subangular Gravel, no odor, wet, very soft (pp=0 tons/sq. feet). Glacial Till.<br>Gray (10 YR 5/1) Silty CLAY, little fine to medium subangular Sand, few fine to coarse subangular Gravel, | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result; NA = Not Applicable/Not Available.
Samples collected 0-2' and 2-4' bgs.
pp = pocket penetrometer

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/22/01 | 4.7', 10.3', 14.2' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-23-01

**Borehole Depth:** 18' bgs

| DEPTH / ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 725 | 9 | 16-18 | 13 31 50/ 5" | 81 | NA | 3.6 | - | CL | | no odor, dry, very stiff (pp=3.5 tons/sq. feet). Glacial Clay Till. Homogeneous dark gray (10 YR 4/1) CLAY, some to little Silt, little fine to medium subrounded to subangular Sand, few rounded to subrounded Gravel, no odor, dry, very hard (pp=>4.5 tons/sq. feet). Clay Till. | CLAY | #5 Global filter sand pack 2-18' bgs. |

20
720
25
715
30
710
35

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result;
NA = Not Applicable/Not Available.
Samples collected 0-2' and 2-4' bgs.
pp = pocket penetrometer

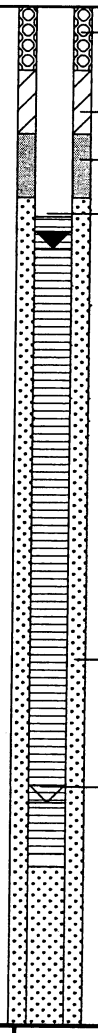
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/22/01 | 4.7', 10.3', 14.2' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/22/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 562895.87<br>**Easting:** 13305606.46<br>**Casing Elevation:** 740.37<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-23-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 740 | 1 | 0-2 | NA | NA | NA | 3.0 | - | FL | Coarse angular limestone PEBBLES and GRAVEL, with gray-brown (10 YR 5/2) Silty fine to medium subangular SAND, no odor, moist with rainfall, loose, metallic debris also present. FILL. | FILL |
| | | 2 | 2-4 | 3 2 2 2 | 4 | 1.0 | 2.6 | - | ML | Black (10 YR 2/1) SILT, little fine dark yellow-brown (10 YR 4/6) subangular Sand, little to locally some Clay, aplastic, no odor, moist, dense. | SILT and CLAY |
| | | | | | | | | | CL | Dark yellow-brown (10 YR 4/4) Silty CLAY, little fine subangular Sand, no odor, wet, very soft (pp=0.5 tons/sq. feet). | |
| 5 | 735 | 3 | 4-6 | 1 4 3 7 | 7 | 1.7 | 4.1 | - | ML CL ML | Yellow-brown (10 YR 5/6) SILT, little Clay, few fine to medium subangular Sand, aplastic, no odor, wet, moderately dense. | |
| | | 4 | 6-8 | 4 5 6 6 | 11 | 2.0 | 4.2 | - | SP ML | Yellow-brown (10 YR 5/6) CLAY, heavily oxidized, some Silt, little fine to medium subangular to subrounded Sand, trace fine to coarse rounded to subrounded Gravel, no odor, moist, medium stiff (pp=2.75 tons/sq. feet). Clay Till. | |
| | | | | | | | | | | Yellow-brown SILT, as at 5-5.3' bgs. | |
| | | 5 | 8-10 | 2 3 4 6 | 7 | 2.0 | 2.5 | - | | Brown (10 YR 5/3) fine to coarse (mostly fine to medium) subangular SAND, some Silt, little Clay, aplastic, no odor, wet, loose. | |
| | | | | | | | | | | Gray (10 YR 5/1) SILT, as at 5-5.3' bgs, with mottled oxidation. | |
| 10 | 730 | 6 | 10-12 | 2 3 5 6 | 8 | 2.0 | 5.2 | - | CL | Gray (10 YR 5/1) Silty CLAY, few fine to medium subangular Sand, trace fine to coarse subrounded Gravel, no odor, moist, medium stiff (pp=2.0 tons/sq. feet). Clay Till. At 11.5':pp=2.5 tons/sq. feet, local decreases to Clay with Silt. | |
| | | 7 | 12-14 | 7 10 12 14 | 22 | 1.8 | 5.0 | - | SP | Gray (10 YR 5/1) fine to coarse (mostly medium to coarse) subangular SAND, with Clay, some Silt, aplastic, no odor, wet, loose. | SAND |
| | | | | | | | | | ML | Gray (10 YR 5/1) SILT, as at 6.2-6.7' bgs, no mottling, with sandy areas, moist to damp. | SILT |
| 15 | 725 | 8 | 14-16 | 7 13 20 25 | 33 | 1.1 | 3.2 | - | CL | Homogeneous dark gray (10 YR 4/1) CLAY, some Silt, little fine to medium subangular to subrounded Sand, few fine to coarse rounded to subrounded Gravel, no odor, dry, very hard (pp>=4.5 tons/sq. feet). Clay Till. | CLAY |

**Boring Construction**



- Cement pad with 9" diam. flush-mount cover.
- Grout 1-2' bgs.
- Bentonite seal 2-3' bgs.
- 2" ID Sch. 40 PVC riser 0.2-3.3' bgs.
- #5 Global filter sand pack 3-18' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 3.3-13.3' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Sample collected 3-3.8' bgs.
pp = pocket penetrometer

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/22/01 | 3.8', 12.5' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-23-02

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 25<br>50/<br>4" | NA | 1.0 | 3.6 | - | CL | | Homogeneous dark gray (10 YR 4/1) CLAY, some Silt, little fine to medium subangular to subrounded Sand, few fine to coarse rounded to subrounded Gravel, no odor, dry, very hard (pp>=4.5 tons/sq. feet). Clay Till. | ← CLAY → | #5 Global filter sand pack 3-18' bgs. |
| 20 | 720 | | | | | | | | | | | | |
| 25 | 715 | | | | | | | | | | | | |
| 30 | 710 | | | | | | | | | | | | |
| 35 | 705 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Sample collected 3-3.8' bgs.
pp = pocket penetrometer

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/22/01 | 3.8', 12.5' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/15/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2' cont. acetate sleeve<br>**Auger Size:** 2 1/4"<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 562975.63<br>**Easting:** 13305297.24<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** 743.25<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-29-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | |
| 0 | | | | | | | FL | | CONCRETE. | FILL | |
| | | | | | | | SP | | Black (10YR 2/1) fine to medium SAND, trace Silt and Clay, trace subrounded Gravel, medium dense, no odor, dry. | SAND | |
| | | 1 | 0-2 | 1.3 | 2.1 | - | SM | | Very dark grayish-brown (10YR 3/2) Silty SAND, trace Clay, no odor, moist. | | |
| | 740 | 2 | 2-4 | 1.6 | 2.8 | - | | | Yellowish-brown (10YR 5/4) fine SAND, trace Clay and subrounded to subangular Gravel, dense, no odor. | | Borehole backfilled with Bentonite to grade. |
| 5 | | 3 | 4-6 | 2.0 | 2.6 | - | | | Yellowish-brown (10YR 5/4) Silty SAND, trace Clay, dense, no odor, moist, saturated at 5.7' bgs. | | |
| | | 4 | 6-8 | 2.0 | 6.4 | - | ML | | Black (10YR 2/1) SILT, dense, no odor, moist. | SILT | |
| | | | | | | | | | Dark yellowish-brown SILT, little fine Sand, dense, no odor, moist. | | |
| | 735 | 5 | 8-10 | 2.0 | 6.2 | - | CL | | Gray to yellow (10YR 6/1 and 5/6) CLAY, gray mottled, plastic (pp=2 tons/sq. ft.). | CLAY | |
| 10 | | | | | | | | | | | |
| | 730 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collect from 0.6-2' and 2-4' bgs.
1" Temporary Well set at 9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/15/01 | 5.7' | NA |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/05/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' + 2" ID<br>**Auger Size:** 4 1/4" ID HSA<br>**Rig Type:** CME 55 | **Northing:** 563002.23<br>**Easting:** 13305295.82<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 3' bgs<br>**Surface Elevation:** 743.52<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-29-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | Concrete. | FILL | |
| | | 1 | 1-3 | 5<br>5<br>6<br>7 | 11 | 1.9 | 0.0 | - | ML | | Very dark gray-brown (10YR 3/2) SILT, little fine to coarse subrounded Sand, little Clay aplastic, no odor, moderately dense, dry. Concrete, Metallic debris, and Ash present. Fill.<br>Yellow-brown (10YR 5/4) SILT, some Clay, little fine to medium subangular to subrounded Sand; aplastic, no odor, dense to moderately dense, damp. Backfill. | SILT | Borehole backfilled with Bentonite to grade. |
| 5 | 5 | | | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Sample collected 1-3' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/05/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 562982.39<br>**Easting:** 13305315.69<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 3' bgs<br>**Surface Elevation:** 743.16<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-29-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | | | Concrete. | FILL | |
| | | 1 | 1-3 | 3<br>4<br>4<br>5 | 8 | 1.2 | 1.8 | - | ML | | Yellow-brown (10YR 5/4) SILT, some Clay, little fine to medium subrounded Sand, aplastic, no odor, moderately dense to dense, dry. Heavily oxidized. Ash and Concrete debris present. Fill. | SILT | Borehole backfilled with Bentonite to grade. |
| 5 | 5 | | | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Sample collected 1-3' bgs.

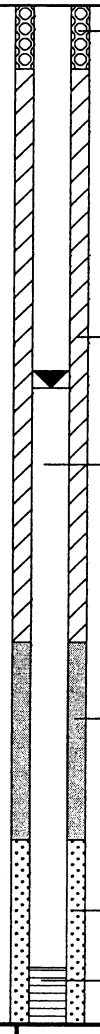
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 08/21/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 568558.92<br>**Easting:** 13306027.27<br>**Casing Elevation:** 756.63<br><br>**Borehole Depth:** 26' bgs<br>**Surface Elevation:** 757.11<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | | |
| | | 1 | 0-2 | NA<br>4<br>7<br>8 | 11 | 1.5 | 0.0 | - | FL | | ASPHALT | FILL |
| | 755 | | | | | | | | CL | | Dark yellow brown (10YR 4/4) Silty CLAY, little fine to medium subangular to subrounded Sand, few fine to coarse rounded to subrounded Gravel. No odor, damp stiff. Heavy oxidized. Clay till. | SILTY CLAY |
| | | 2 | 2-4 | 7<br>8<br>10<br>11 | 18 | 1.5 | 0.0 | - | | | Becomes yellow brown (10YR 5/4). | |
| 5 | | 3 | 4-6 | 4<br>7<br>8<br>10 | 15 | 2.0 | 0.0 | - | | | | |
| | 750 | 4 | 6-8 | 4<br>6<br>10<br>10 | 16 | 2.0 | 0.0 | - | | | Decreased sand to few, damp to moist. | |
| | | 5 | 8-10 | 3<br>4<br>8<br>9 | 12 | 2.0 | 0.0 | - | | | Heavily oxidized. 3" thick seam of dark reddish brown, moist to wet SILT, no odor, dense, aplastic.<br>at 8.5': becomes brown (10YR 5/3), rapidly decreasing oxidation, becoming grayer.<br>Gray (10 YR 5/1), stiff. | |
| 10 | | 6 | 10-12 | 5<br>7<br>9<br>12 | 16 | 2.0 | 0.0 | - | | | at 10.1': Moist to wet, 1-2" wide gray (10YR 5/1) SILT lenses/seams throughout, heavily oxidized lens contact. | |
| | 745 | | | | | | | | ML | | Yellow brown (10YR 5/6) aplastic SILT, moist, no odor, dense. | SILTY SAND |
| | | 7 | 12-14 | 7<br>11<br>15<br>30 | 26 | 1.4 | 0.0 | - | SM | | Light yellow brown (10YR 6/4) Silty fine subrounded to subangular SAND, trace Clay, no odor, damp to moist, dense to very dense. Occasional darker yellow brown (10YR 5/4) silt varves @ 13-14' bgs. Glacial-alluvial. | |
| 15 | | 8 | 14-16 | 12<br>20<br>26<br>30 | 46 | 1.4 | 0.0 | - | | | No more silt varves. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.5-2.5', 8.5-10.5 and 12.5-14.5' bgs

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/21/01 | 16.3' | |

**Client:**
General Motors

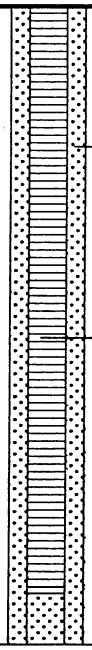
**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-01

**Borehole Depth:** 26' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | 9 | 16-18 | 9 7 8 16 | 15 | 2.0 | 0.0 | - | SM | | at 16.3': Yellow brown (10YR 5/4) SILT, few fine subangular to subrounded Sand, no odor, moderately dense, saturated . At 16.6': Silty SAND as above, moist to wet. | SILT |
| | | | | | | | | | CL | | Homogeneous gray (10YR 5/1) Silty CLAY, few to trace fine subangular to subrounded Sand, intermittent saturated silt lenses and seams up to 4" thick thoughout, stiff, no odor, damp. Clay Till. | CLAY |
| | | 10 | 18-20 | 4 7 7 8 | 14 | 2.0 | 0.0 | - | SP | | Brown (10YR 5/3) fine to coarse subangular to angular Sand, few to little Silt, no odor, saturated, moderately dense. Glacial-alluvial | SAND |
| | | | | | | | | | ML | | Gray (10YR 5/1) aplastic SILT, little Clay, no odor, dense, saturated. Glacial-alluvial | SILT |
| 20 | | 11 | 20-22 | 4 7 7 7 | 14 | 1.8 | 0.0 | - | SP | | SAND as at 18.1'-18.8' bgs. Glacial-alluvial | SAND |
| | 735 | 12 | 22-24 | 2 5 9 9 | 14 | 1.5 | 0.0 | - | | | | |
| 25 | | 13 | 24-26 | 2 3 4 5 | 7 | 2.0 | 0.0 | - | | | | |
| | | | | | | | | | ML | | Gray (10 YR 5/1) saturated SILT as at 18.8' - 20.0'. Glacial-alluvial | SILT |
| | | | | | | | | | SP | | SAND as at 20.0' - 25.1' bgs. Glacial-alluvial | |
| | 730 | | | | | | | | | | | |
| 30 | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | |
| 35 | | | | | | | | | | | | |

**Boring Construction**



bgs.

#5 Global filter sandpack 13.1-26' bgs.

2" ID Sch. 40 PVC 0.010" slotted screen 15.1-25.1' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.5-2.5', 8.5-10.5 and 12.5-14.5' bgs

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/21/01 | 16.3' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 08/21/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 568558.92<br>**Easting:** 13306027.27<br>**Casing Elevation:** 756.63<br><br>**Borehole Depth:** 42.5 ft.<br>**Surface Elevation:** 757.11<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-01 (Geotech)<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | | | Refer to RFI-36-01 for complete soil descriptions. Blind drilled to 18.0' bgs. | | |
| 5 | 5 | | | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

Borehole tremie grouted.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Sh = Shelby Tubes collected 20-22' and 40-40.5' bgs;
Geotech samples collected 22.2-23', 23-24', and 41-42' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/21/01 | 42.0' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-01 (Geotech)

**Borehole Depth:** 42.5 ft.

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Refer to RFI-36-01 for complete soil descriptions. Blind drilled to 18.0' bgs. | | |
| | | 1 | 18'-20' | 7 8 10 9 | 18 | 1.8 | 0.0 | - | ML-CL | | Brown (10 YR 5/3), aplastic, SILT, some to little Clay, no odor, saturated, dense. Glacial-alluvial | | |
| | | | | | | | | | | | Brown (10 YR 5/3), aplastic, fine to medium subangular to subrounded SAND, few Silt, no odor, saturated, moderately dense. | | |
| | | | | | | | | | | | SILT, as at 18-18.6' bgs, coarsens downward to SAND, as at 18.6-18.7' bgs, saturated. Glacial-alluvial | | |
| 20 | 20 | 1 Sh | 20'-22' | NA | NA | 0.5 | NA | NA | SP | | Gray (10 YR 5/1) Silty CLAY, very stiff to stiff, no odor, damp. Glacial clay | SAND | Borehole tremie grouted. |
| | | | | | | | | | | | SILT, as at 18-18.6' bgs, but gray-brown (10 YR 5/2), saturated. | | |
| | | 2 | 22'-24' | 2 3 4 8 | 7 | 1.8 | NA | - | | | Brown (10 YR 5/3), fine to coarse subangular to angular SAND, few to little Silt, no odor, saturated, moderately dense. Glacial-alluvial | | |
| 25 | 25 | 2 Sh | 24'-26' | NA | NA | 0.0 | NA | NA | | | Shelby tube, no recovery. | | |
| 30 | 30 | | | | | | | | | | Blind drilled to 34.5' bgs. | | |
| 35 | 35 | 3 | 34'-36' | 3 4 4 6 | 8 | 2.0 | 0.0 | - | CL | | Gray (10 YR 5/1) Silty CLAY, little to few fine to coarse subrounded Sand, trace fine rounded Gravel, soft to medium stiff, no odor, damp, very plastic. Clay Till. Occasional silt lenses up to 1" wide throughout. | LAY and SIL | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Sh = Shelby Tubes collected 20-22' and 40-40.5' bgs;
Geotech samples collected 22.2-23', 23-24', and 41-42' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/21/01 | 42.0' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-01 (Geotech)

**Borehole Depth:** 42.5 ft.

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Gray (10 YR 5/1) Silty CLAY, little to few fine to coarse subrounded Sand, trace fine rounded Gravel, soft to medium stiff, no odor, damp, very plastic. Occasional silt lenses up to 1" wide throughout. Clay Till. | CLAY and SILT | |
| | | 4 | 38'-40' | 13<br>31<br>52/.(<br>0 | 83 | 2.0 | 0.0 | NA | CL | | Hard. | | Borehole tremie grouted. |
| 40 | 40 | 3 Sh | 40'-40. | NA | NA | 0.5 | NA | NA | | | | | |
| | | 5 | 40.5'-4 | 13<br>19<br>32<br>42 | 51 | 1.5 | 0.0 | - | | | Increase in Gravel to few fine to coarse subrounded to rounded, and increased Sand to little. | | |
| | | | | | | | | | SP | | Gray (10 YR 5/1) fine to coarse subangular SAND, little to some Silt, little fine to coarse subrounded to subangular Gravel, few Clay, aplastic. Fines downward with decreased gravel and sand content to a silty sand at 42.5' bgs. | | |
| 45 | 45 | | | | | | | | | | | | |
| 50 | 50 | | | | | | | | | | | | |
| 55 | 55 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Sh = Shelby Tubes collected 20-22' and 40-40.5' bgs;
Geotech samples collected 22.2-23', 23-24', and 41-42' bgs.

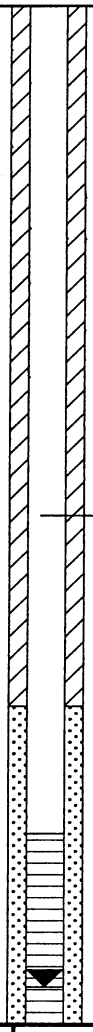
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/21/01 | 42.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/17/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4" ID HSA<br>**Rig Type:** CME 55 | **Northing:** 568615.89<br>**Easting:** 13307007.02<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 23 bgs<br>**Surface Elevation:** 751.96<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | FL | | ASPHALT. | |
| | 750 | 1 | 1-3 | 4 5 7 9 | 12 | 1.1 | 5.8 | - | SM | | Yellow-brown (10YR 5/6) Silty fine to coarse subangular to subrounded SAND, little Clay; aplastic, no odor, dry, moderately dense. Fill. | FILL |
| | | 2 | 3-5 | 5 4 2 2 | 6 | 1.2 | 4.1 | + | | | | |
| 5 | | 3 | 5-7 | 2 2 5 2 | 7 | 1.0 | 4.8 | - | | | Silty SAND as above, but black (10 YR 2/1) , trace fine to medium subrounded Gravel. Fill.<br>Silty SAND as at 1-4.9' bgs, but with lenses of Clay up to 2" wide throughout, Slag at upper contact. Fill. | |
| | 745 | 4 | 7-9 | 2 2 3 4 | 5 | NA | 6.6 | - | | | | |
| | | 5 | 9-11 | 2 2 2 4 | 4 | 1.3 | 6.7 | + | ML | | Yellow-brown (10YR 5/4) SILT, little fine subangular to subrounded Sand, few Clay; aplastic, no odor, damp with increased moisture content with depth, moderately dense to moderately loose. | |
| 10 | | | | | | | | | SM | | Light yellow-brown (10YR 6/4) Silty fine to medium subangular SAND, trace Clay; aplastic, no odor, damp, moderately dense to moderately loose, locally oxidized. Glacial-alluvial. | SILTY SAND |
| | 740 | 6 | 11-13 | 2 2 2 3 | 4 | 1.5 | 5.0 | + | | | | |
| | | 7 | 13-15 | 2 2 3 2 | 5 | 1.5 | 4.1 | + | | | Damp to moist. | |
| 15 | | 8 | 15-17 | 2 2 | 6 | 1.6 | 2.4 | - | | | at 15.4': Saturated. Becomes gray-brown (10YR 5/2) medium to fine graded, no Clay. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Shake Test
NA = Not Applicable/Not Available.
Set 13' - 23' screened well.
Samples collected 1-3', 7-9' 9-11', and 13-15' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 09/17/01 | 15.4' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-02

**Borehole Depth:** 23 bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | 8 | 15-17 | 4 6 | 6 | 1.6 | 2.4 | - | SM | | Light yellow-brown (10YR 6/4) Silty fine to medium subangular SAND, trace Clay; aplastic, no odor, damp, moderately dense to moderately loose, locally oxidized. Glacial-alluvial. | SILTY SAND | |
| | | 9 | 17-19 | 3 3 6 6 | 9 | 1.8 | 1.5 | - | | | at 17.0'bgs: Decreased density with depth. | | |
| 20 | | 10 | 19-21 | 2 2 1 3 | 3 | 1.2 | 1.8 | - | | | | | 2" ID Sch. 40 PVC 0.010" slotted screen 13-23' bgs. |
| | 730 | 11 | 21-23 | 1 2 3 3 | 5 | 1.6 | 0.0 | - | | | | | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Shake Test
NA = Not Applicable/Not Available.
Set 13' - 23' screened well.
Samples collected 1-3', 7-9' 9-11', and 13-15' bgs.

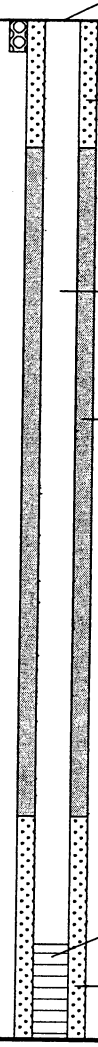
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 09/17/01 | 15.4' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/20/00<br>**Drilling Company:** Mateco<br>**Driller's Name:** John Pitch, Roy Hoin<br>**Drilling Method:** Driven, temporary casing<br>**Bit Size:**<br>**Auger Size:**<br>**Rig Type:** CME 45, skid mount<br>**Sampling Method:** 2" diam.<br>**Hammer Weight:** 140 lbs., 30" fall | **Northing:** 567969.80<br>**Easting:** 13307091.08<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** 751.31<br><br>**Geologist:** Brian Loomis | **Well/Boring ID:** RFI-36-03<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | 1 | 0-0.8 | 0.8 | NA | 0.0 | | | CONCRETE. |
| | 750 | 2 | 0.8-2 | 2.0 | NA | 0.0 | | | Brown and gray fine SAND.<br>Dark brown fine SAND.<br>Brown fine SAND. |
| | | 3 | 2-4 | 2.0 | NA | 0.0 | | | Dark brown Silty CLAY, trace fine Sand, trace Gravel. |
| 5 | | 4 | 4-6 | 2.0 | NA | 0.0 | | | Brown CLAY with gray mottles, trace Sand, trace Silt. |
| | 745 | 5 | 6-8 | 2.0 | NA | 0.0 | | | Brown CLAY, some fine brown Sand.<br>Brown fine SAND, moist-wet @15.4'-16'. |
| 10 | | 7 | 8-10 | 1.4 | NA | 0.0 | | | |
| | 740 | 8 | 10-12 | 1.6 | NA | 0.0 | | | |
| | | 9 | 12-14 | 1.8 | NA | 0.0 | | | |
| 15 | | 10 | 14-16 | 2.0 | NA | 0.0 | | | |

Well/Boring Construction




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Samples collected 0.8-2', 8-10' and 14-16' bgs.
RFI-36-DUP-2 collected between 14'-16' below grade.

**Client:**
General Motors

**Site Location:**
GM-Flint - Focused RFI
Factory 36, Building 36

**Well/Boring ID:** RFI-36-03

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | 11 | 16-18 | 1.7 | NA | 0.0 | | | Brown fine SAND, saturated. | Colorado #2040 Silica Sand (12.5' - 19.5' bgs) |
| | | 12 | 18-20 | 2.0 | NA | 0.0 | | | | 1.5" ID Sch. 40 PVC 0.010" Slot Screen (14.5' - 19.5' bgs) |
| 20 | | | | | | | | | | |
| | 730 | | | | | | | | | |
| 25 | | | | | | | | | | |
| | 725 | | | | | | | | | |
| 30 | | | | | | | | | | |
| | 720 | | | | | | | | | |
| 35 | | | | | | | | | | |

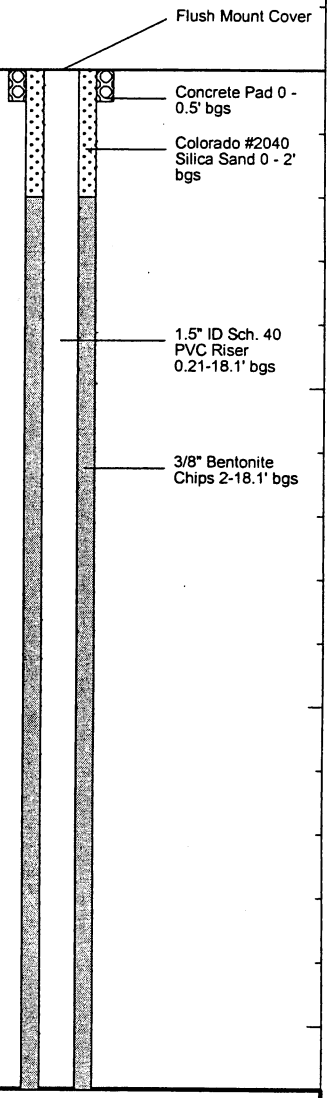
BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Samples collected 0.8-2', 8-10' and 14-16' bgs.
RFI-36-DUP-2 collected between 14'-16' below grade.

| | | |
|---|---|---|
| **Date Start/Finish:** 12/19/00<br>**Drilling Company:** Mateco<br>**Driller's Name:** John Pitch, Roy Hoin<br>**Drilling Method:** Driven, temporary casing<br>**Bit Size:**<br>**Auger Size:**<br>**Rig Type:** CME 45, skid mount on tracks<br>**Sampling Method:** 2' x 2"<br>**Hammer Weight:** 140 lbs. | **Northing:** 568413.93<br>**Easting:** 13306802.24<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 24' bgs<br>**Surface Elevation:** 756.14<br><br>**Geologist:** B Loomis | **Well/Boring ID:** RFI-36-04<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | 1 | 0-0.6 | 0.6 | NA | 0.0 | | | CONCRETE. |
| | 755 | 2 | 0.6-2 | 1.1 | NA | 0.0 | | | Brown fine SAND, trace Silt.<br>Dark brown fine SAND, trace Silt, trace Gravel. |
| | | 3 | 2-4 | 1.5 | NA | 0.0 | | | Brown firm CLAY, trace to some fine Sand.<br>Brown fine SAND.<br>Dark brown fine SAND. |
| 5 | | 4 | 4-6 | 2.0 | NA | 0.0 | | | Brown Sandy CLAY.<br>Dark brown fine to medium SAND. |
| | 750 | 5 | 6-8 | 1.5 | NA | 0.0 | | | Fine to medium SAND with Brick fragments, some Clay, some Silt, trace angular Gravel. FILL. |
| | | 7 | 8-10 | 1.8 | NA | 0.0 | | | Brown fine to medium SAND. |
| 10 | | | | | | | | | Brown Silty fine SAND. |
| | 745 | 8 | 10-12 | 1.5 | NA | 0.0 | | | Brown fine SAND. |
| | | 9 | 12-14 | 1.7 | NA | 0.0 | | | |
| 15 | | 10 | 14-16 | 1.6 | NA | 0.2 | | | |

Well/Boring Construction




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Samples collected 0.6-2', 8-10' and 18-20' bgs.
RFI-36-DUP-1 collected 18-20' bgs.
Rinse Blank RFI 36 RB-1 collected12/19/00 from split spoon

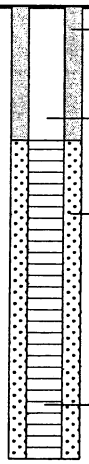
**Client:**
General Motors

**Site Location:**
GM-Flint - Focused RFI
Factory 36, Building 36

**Well/Boring ID:** RFI-36-04

**Borehole Depth:** 24' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | Brown fine SAND, wet @ 21.5', saturated 22'-24'. | 3/8" Bentonite Chips 2-18.1' bgs; 1.5" ID Sch. 40 PVC Riser 0.21-18.1' bgs; Colorado #2040 Silica Sand 18.1-23.1' bgs; 1.5" ID Sch. 40 PVC 0.010" Slot Screen 18.1-23.1' bgs |
| | | 11 | 16-18 | 2.0 | NA | 0.0 | | | | |
| | | 12 | 18-20 | 1.2 | NA | | | | | |
| 20 | | | | | | | | | | |
| | 735 | 13 | 20-22 | 1.5 | NA | 0.0 | | | | |
| | | 14 | 22-24 | 2.0 | NA | | | | | |
| 25 | | | | | | | | | | |
| | 730 | | | | | | | | | |
| 30 | | | | | | | | | | |
| | 725 | | | | | | | | | |
| 35 | | | | | | | | | | |



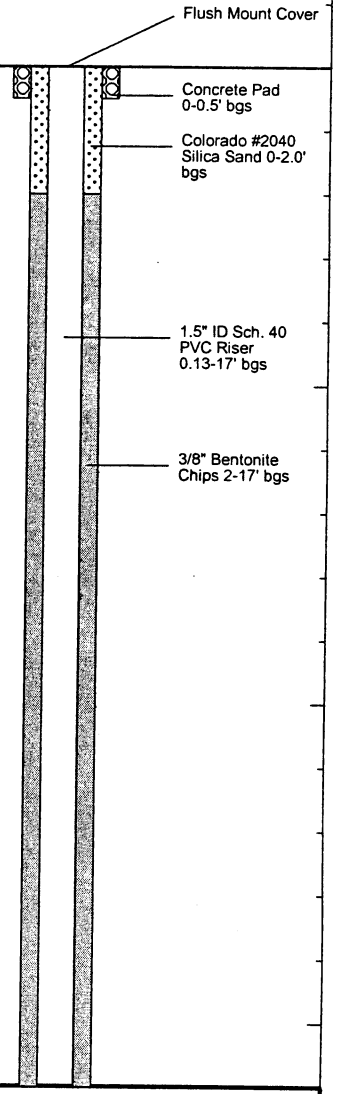
BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Samples collected 0.6-2', 8-10' and 18-20' bgs.
RFI-36-DUP-1 collected 18-20' bgs.
Rinse Blank RFI 36 RB-1 collected12/19/00 from split spoon

| | | |
|---|---|---|
| **Date Start/Finish:** 12/18/00<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Bit Size:**<br>**Auger Size:**<br>**Rig Type:** Geoprobe 66 DT Track Rig<br>**Sampling Method:** 2" diam. + disposable liner<br>**Hammer Weight:** | **Northing:** 568046.67<br>**Easting:** 13306972.1<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 22' bgs<br>**Surface Elevation:** 755.07<br><br>**Geologist:** Ron Kuhn | **Well/Boring ID:** RFI-36-05<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 755 | 1 | 0-0.8 | 0.8 | NA | 0.0 | | | CONCRETE. |
| | | 2 | 0.8-2 | 1.0 | NA | 0.0 | | | Light brown to gray-black fine SAND, trace Silt, trace fine Gravel, damp, loose. |
| | | 3 | 2-4 | 0.8 | NA | 0.0 | | | Light brown fine SAND, trace Silt, damp, loose. |
| 5 | 750 | 4 | 4-6 | 0.8 | NA | 0.0 | | | |
| | | 5 | 6-8 | 1.6 | NA | 0.0 | | | Olive-brown to orange-brown Clayey SILT, trace fine Sand, damp. |
| | | 7 | 8-10 | 2.0 | NA | 0.0 | | | Light brown very fine SAND, loose, damp, slight odor at 12-13.5 feet bgs. |
| 10 | 745 | 8 | 10-12 | 2.0 | NA | 0.0 | | | |
| | | 9 | 12-14 | 1.5 | NA | 0.0 | | | |
| 15 | 740 | 10 | 14-16 | 1.6 | NA | 0.2 | | | Light brown very fine SAND, loose, damp. |

Well/Boring Construction




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Samples collected 0.8-2', 8-10' and 16-18' bgs.

**Client:**
General Motors

**Site Location:**
GM-Flint - Focused RFI
Factory 36, Building 36

**Well/Boring ID:** RFI-36-05

**Borehole Depth:** 22' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 11 | 16-19 | 3.0 | NA | 0.0 | | | Light brown fine SAND, loose, saturated @ 18 feet. | 3/8" Bentonite Chips 2-17' bgs; 1.5" ID Sch. 40 PVC Riser 0.13-17' bgs; Colorado #2040 Silica Sand 17-22' bgs |
| 20 | 735 | 12 | 19-22 | 1.9 | - | 0.0 | | | | 1.5" ID Sch. 40 PVC 0.010" Slot Screen 17-22' bgs |
| 25 | 730 | | | | | | | | | |
| 30 | 725 | | | | | | | | | |
| 35 | 720 | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Samples collected 0.8-2', 8-10' and 16-18' bgs.

**Date Start/Finish:** 12/19/00
**Drilling Company:** Mateco
**Driller's Name:** Gary Swift
**Drilling Method:** Direct Push
**Bit Size:**
**Auger Size:**
**Rig Type:** Geoprobe 66 DT Track Rig
**Sampling Method:** 2" diam. + disposable liner
**Hammer Weight:**

**Northing:** 568045.87
**Easting:** 13306577.76
**Casing Elevation:** NA

**Borehole Depth:** 21' bgs
**Surface Elevation:** 755.29

**Geologist:** Ron Kuhn

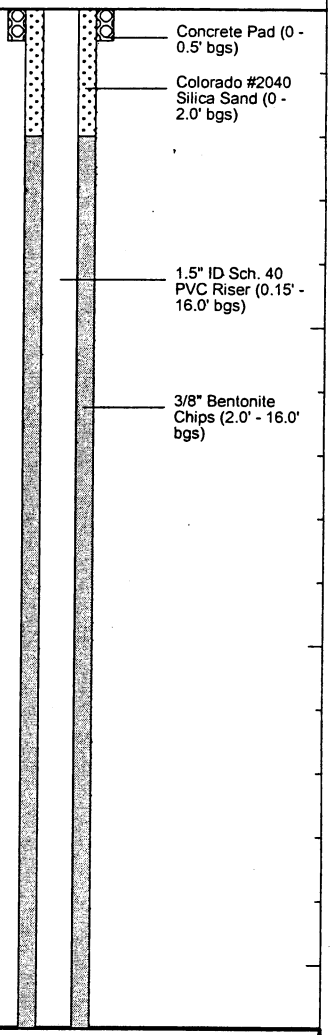
**Well/Boring ID:** RFI-36-06

**Client:** General Motors

**Location:** GM-Flint - Focused RFI
Factory 36, Building 36

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 755 | 1 | 0-0.7 | 0.7 | | | | | CONCRETE. |
| | | 2 | 0.7-2 | 1.0 | - | 0.8 | | | Dark brown to gray-brown very fine SAND, little Silt, damp, slight odor. |
| | | 3 | 2-4 | 2.0 | NA | 0.0 | | | Olive-brown to orange-brown Clayey SILT, trace very fine Sand, damp. |
| 5 | 750 | 4 | 4-6 | 1.6 | NA | 0.0 | | | |
| | | 5 | 6-8 | 1.6 | NA | 0.0 | | | |
| | | 6 | 8-10 | 0.0 | NA | | | | No Recovery. |
| 10 | 745 | 7 | 10-12 | 1.6 | NA | 0.0 | | | Light brown to orange-brown very fine SAND, damp, loose. |
| | | 8 | 12-14 | 1.6 | NA | 0.0 | | | |
| 15 | 740 | 9 | 14-16 | 2.0 | NA | 0.2 | | | |

Well/Boring Construction




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Samples collected 0.7-2', 6-8' and 16-17' bgs.
+ = Positive Test Result

**Client:**
General Motors

**Site Location:**
GM-Flint - Focused RFI
Factory 36, Building 36

**Well/Boring ID:** RFI-36-06

**Borehole Depth:** 21' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 16-18 | 2.0 | + | 0.0 | | | Light gray to gray fine SAND, loose, saturated @ 17 feet, slight odor, Jar test for NAPL, NAPL is clear. | Colorado #2040 Silica Sand (16.0' - 21.0' bgs) |
| | | 11 | 18-21 | 3.0 | + | 7.5 | | | Gray fine SAND, loose, saturated, slight odor. Jar test (sheen present). | 1.5" ID Sch. 40 PVC 0.010" Slot Screen (16.0' - 21.0' bgs) |
| 20 | 735 | | | | | | | | | |
| 25 | 730 | | | | | | | | | |
| 30 | 725 | | | | | | | | | |
| 35 | 720 | | | | | | | | | |

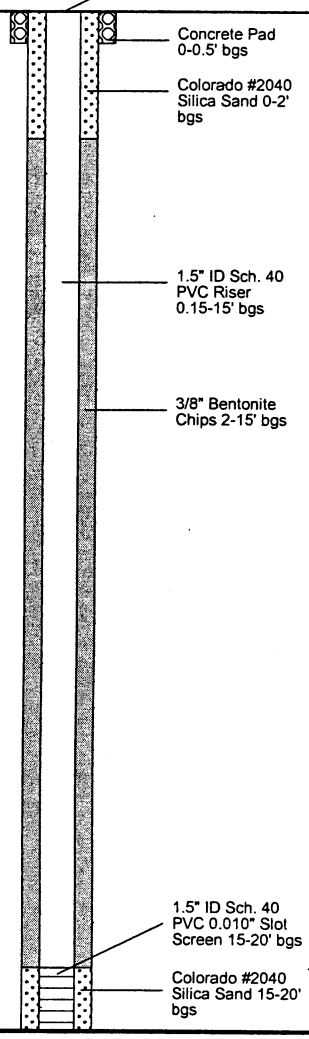
BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Samples collected 0.7-2', 6-8' and 16-17' bgs.
+ = Positive Test Result

| | | |
|---|---|---|
| **Date Start/Finish:** 12/20/00<br>**Drilling Company:** Mateco<br>**Driller's Name:** John Pitch, Roy Hoin<br>**Drilling Method:** Driven, temporary casing<br>**Bit Size:** NA<br>**Auger Size:** NA<br>**Rig Type:** CME 45, skid mount<br>**Sampling Method:** 2" diam.<br>**Hammer Weight:** 140 lbs, 30" fall | **Northing:** 567646.52<br>**Easting:** 13306735.24<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** 753.99<br><br>**Geologist:** Brian Loomis | **Well/Boring ID:** RFI-36-07<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | |
| 0 | | 1 | 0-0.8 | | | | | | CONCRETE. |
| | | 2 | 0.8-2 | 1.2 | NA | 14.6 | | | Brown and gray fine SAND, hydrocarbon odor. |
| | | 3 | 2-4 | 0.1 | NA | 18.2 | | | Same as above, strong hydrocarbon odor. |
| | 750 | | | | | | | | Dark brown SAND and CLAY, trace Gravel, strong odor, product @ 4.6'. |
| 5 | | 4 | 4-6 | 1.5 | NA | 7.9 | | | Brown fine SAND, odor, product present. |
| | | 5 | 6-8 | 1.4 | NA | 16.8 | | | Brown fine SAND, product @ ~13.8'. |
| | 745 | 7 | 8-10 | 2.0 | NA | 20.3 | | | |
| 10 | | 8 | 10-12 | 2.0 | NA | 19.7 | | | |
| | | 9 | 12-14 | 2.0 | NA | 17.6 | | | |
| | 740 | | | | | | | | Brown fine SAND, slight hydrocarbon odor, saturated. |
| 15 | | 10 | 14-16 | 2.0 | NA | 13.6 | | | |

Well/Boring Construction




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Samples collected 0.8-2', 8-10' and 12-14' bgs.
Rinse Blank RFI 36 RB-2 collected12/20/00 from split spoon.
NA=Not Available/Not Applicable

**Client:**
General Motors

**Site Location:**
GM-Flint - Focused RFI
Factory 36, Building 36

**Well/Boring ID:** RFI-36-07

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 11 | 16-18 | 2.0 | NA | 12.5 | | | Brown fine SAND, slight hydrocarbon odor, saturated.<br>Brown Sandy CLAY, stiff, saturated. | Colorado #2040 Silica Sand 15-20' bgs |
| | 735 | 12 | 18-20 | 2.0 | NA | 13.2 | | | Brown fine SAND, saturated.<br>Brown CLAY, stiff, saturated | 1.5" ID Sch. 40 PVC 0.010" Slot Screen 15-20' bgs |
| 20 | | | | | | | | | | |
| | 730 | | | | | | | | | |
| 25 | | | | | | | | | | |
| | 725 | | | | | | | | | |
| 30 | | | | | | | | | | |
| | 720 | | | | | | | | | |
| 35 | | | | | | | | | | |

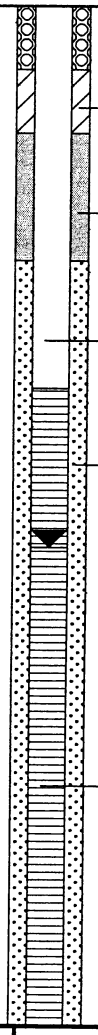
BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Samples collected 0.8-2', 8-10' and 12-14' bgs.
Rinse Blank RFI 36 RB-2 collected12/20/00 from split spoon.
NA=Not Available/Not Applicable

| | | |
|---|---|---|
| **Date Start/Finish:** 7/17/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2" ID x 2'<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 567312.98<br>**Easting:** 13306891.18<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 749.29<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-08<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 750 | | | | | | | | | | | |
| 0 | | | | | | | | | FILL | | Concrete. | FILL |
| | | 1 | 1-3 | 3 4 4 5 | 8 | 1.1 | 1889 | - | ML | | Very dark gray-brown (10 YR 3/2) SILT, little fine subangular to angular light brown-gray (10 YR 6/2) Sand, trace Clay, aplastic, moderately dense, no odor, damp. Fill. | |
| | 745 | 2 | 3-5 | 3 4 4 4 | 8 | 1.0 | 3288 | + | | | | |
| 5 | | 3 | 5-7 | 12 20 6 4 | 26 | 0.3 | 2756 | - | FILL | | Pebble-sized subangular very dark gray (10 YR 3/1) SLAG (?) and limestone Gravel, loose, weak odor, moist. Fill. Rubbly Drilling. | |
| | | | | | | | | | ML | | SILT, as above, but moist, no sand. | SILT |
| | | 4 | 7-9 | 9 7 9 12 | 16 | 1.8 | >10,000 | + | | | Becomes gray-brown (10 YR 3/2), moderate odor. | |
| | 740 | 5 | 9-11 | 3 4 9 9 | 13 | 1.1 | 1581 | + | | | Saturated. | |
| 10 | | 6 | 11-13 | 9 9 9 10 | 18 | 1.6 | 1493 | - | | | Local mottling to very dark gray (10 YR 3/1), weak odor. | |
| | 735 | 7 | 13-15 | 2 4 4 4 | 8 | 1.7 | 708 | - | | | No odor, little fine subangular Sand, gray (10 YR 6/1). | |
| 15 | | 8 | 15-17 | 3 4 | 8 | 1.8 | 444 | - | | | | |

**Boring Construction**



- Grout 1-2' bgs.
- Bentonite seal 2-4' bgs.
- 2" ID Sch. 40 PVC riser 0.2-6' bgs.
- #5 Global filter sandpack 4-17' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 6-16' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available
Soil samples taken 1-3' and 6.5-8.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/17/01 | 8.5' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-08

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 15-17 | 4<br>3 | 8 | 1.8 | 444 | - | ML | | Gray (10 YR 6/1) SILT, little fine subangular Sand, no odor, saturated. | SILT | #5 Global filter sandpack 4-17' bgs. |
| | 730 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available
Soil samples taken 1-3' and 6.5-8.5' bgs.

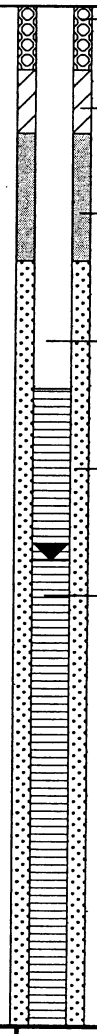
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/17/01 | 8.5' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/17/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 567182.91<br>**Easting:** 13306893.14<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 750.78<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-09<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | | | | | | | | FILL | | Concrete. | FILL |
| | | 1 | 1-3 | 4 12 11 9 | 23 | 1.2 | >10,000 | + | ML | | Very dark gray-brown (10 YR 3/2) SILT, some fine subangular light brown-gray (10 YR 6/2) Sand, few subangular dark gray particles (slag?), aplastic, dense, no odor, moist. Fill. | SILT |
| | | 2 | 3-5 | 1 5 4 4 | 9 | 1.2 | >10,000 | + | | | | |
| 5 | 745 | 3 | 5-7 | 2 2 2 2 | 4 | 2.0 | 431 | - | SM/ ML | | Yellow-brown (10 YR 5/6) Silty SAND to SILT, some fine subangular Sand, moderately dense, no odor, damp. Increasing moisture to 7' bgs. | SILTY SAND & SILT |
| | | 4 | 7-9 | 2 2 2 2 | 4 | 1.7 | 147 | - | | | | |
| 10 | 740 | 5 | 9-11 | 2 2 2 2 | 4 | 1.7 | 0.0 | - | | | Saturated, local thin lenses of oxidation up to 1/4" thick; decreased sand to little. | |
| | | 6 | 11-13 | 3 3 4 4 | 7 | 1.8 | 0.0 | NA | | | | |
| | | 7 | 13-15 | 2 2 4 4 | 6 | 1.9 | 0.0 | NA | | | Silt.<br>Increased clay to little to few, color changes to gray (10 YR 6/1), little fine to coarse subangular Sand, alluvial. | |
| 15 | 735 | 8 | 15-16 | NA | NA | NA | NA | NA | | | | |

**Boring Construction**



- Cement pad with 9" diam. flush-mount cover
- Grout 1-2' bgs.
- Bentonite seal 2-4' bgs.
- 2" ID Sch. 40 PVC riser 0.2-6' bgs.
- #5 Global filter sandpack 4-16' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 6-16' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3' and 5-7' bgs.

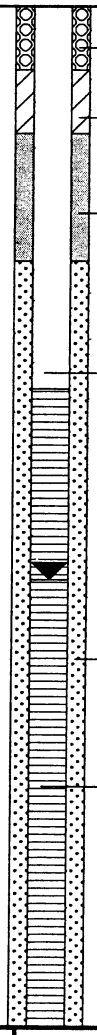
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/17/01 | 8.5' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/18/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 567178.02<br>**Easting:** 13306800.38<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 750.21<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-10<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | | | | | | | | FILL | | Concrete. | FILL |
| | | 1 | 1-3 | 3 4 6 7 | 10 | 1.5 | 3422 | - | SM | | Brown-yellow (10 YR 6/6) Silty fine to medium subangular SAND, trace rounded fine Gravel, aplastic, moderately dense, no odor, dry to damp. Fill. | SILTY SAND |
| | | 2 | 3-5 | 6 5 3 2 | 8 | 0.1 | 2276 | - | | | | |
| 5 | 745 | 3 | 5-7 | 2 2 2 2 | 4 | 1.2 | 2397 | - | ML | | Yellow-brown (10 YR 5/6) fine subangular Sandy SILT, locally mottled to very dark gray (10 YR 2/2), aplastic, moderately loose to moderately dense, no odor, dry to damp.<br>No more mottling. | SANDY SILT |
| | | 4 | 7-9 | 2 1 1 1 | 2 | 1.2 | 3590 | - | | | | |
| | | 5 | 9-11 | 2 2 4 6 | 6 | 1.6 | 1767 | - | SM | | Yellow-brown (10 YR 5/6) Silty fine to medium subangular to subrounded SAND, aplastic, moderately loose to loose, no odor, moist.<br>Saturated, fine subangular sandy Gravel lens. | SILTY SAND |
| 10 | 740 | 6 | 11-13 | 2 2 3 6 | 5 | NA | 1603 | - | ML | | Yellow-brown (10 YR 5/4) SILT, little fine subangular Sand, aplastic, moderately dense to dense, no odor, saturated. Locally oxidized as varves of yellow-brown (10 YR 4/6).<br>Color change to gray (10 YR 5/1), trace Clay and increased density with depth. Glacial-alluvial. | SILT |
| | | 7 | 13-15 | 2 3 4 6 | 7 | NA | 516 | - | | | | |
| 15 | 735 | 8 | 15-16 | NA | NA | NA | NA | NA | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3' and 7-9' bgs.

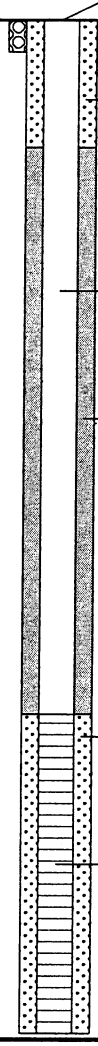
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/18/01 | 9.0' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/21/00<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift, Dennis Powney<br>**Drilling Method:** Direct Push<br>**Bit Size:**<br>**Auger Size:**<br>**Rig Type:** Geoprobe 66 DT Track Rig<br>**Sampling Method:** 2" diam. + disposable liner<br>**Hammer Weight:** | **Northing:** 567241.0<br>**Easting:** 13306735.5<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 752.89<br><br>**Geologist:** Ron Kuhn | **Well/Boring ID:** RFI-36-11<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | |
| 0 | | 1 | 0-0.8 | 0.8 | NA | | | | CONCRETE. |
| | | | | | | | | | Black fine SAND, trace Silt, loose, damp. |
| | | 2 | 0.8-2.0 | 1.2 | NA | 0.0 | | | Black fine foundry SAND, little Silt, loose, damp. |
| | 750 | 3 | 2.0-4.0 | 2.0 | NA | 0.0 | | | Orange-brown Clayey SILT, mottled, trace fine Sand, stiff, damp. |
| 5 | | 4 | 4.0-6.0 | 2.0 | NA | 0.3 | | | |
| | | 5 | 6.0-8.0 | 1.6 | NA | 0.0 | | | Light Brown to orange-brown fine SAND, loose, wet at ~10'. |
| | 745 | 6 | 8.0-10. | 1.5 | NA | 0.0 | | | |
| 10 | | 7 | 10.0-12 | 1.4 | NA | 0.0 | | | Orange-brown grading to gray-brown, very fine SAND, loose, wet. |
| | 740 | 8 | 12.0-14 | 1.5 | NA | 0.0 | | | Gray-brown very fine SAND, saturated. |
| 15 | | 9 | 14.0-16 | 2.0 | NA | | | | |

Well/Boring Construction




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Samples collected 0.8-2', 8-10' and 10-12' bgs.
NA=Not Available/Not Applicable.

**Client:**
General Motors

**Site Location:**
GM-Flint - Focused RFI
Factory 36, Building 36

**Well/Boring ID:** RFI-36-11

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 16.0-18 | 2.0 | NA | | | | Gray-brown very fine SAND, saturated. | |
| | 735 | | | | | | | | | |
| 20 | | | | | | | | | | |
| | 730 | | | | | | | | | |
| 25 | | | | | | | | | | |
| | 725 | | | | | | | | | |
| 30 | | | | | | | | | | |
| | 720 | | | | | | | | | |
| 35 | | | | | | | | | | |

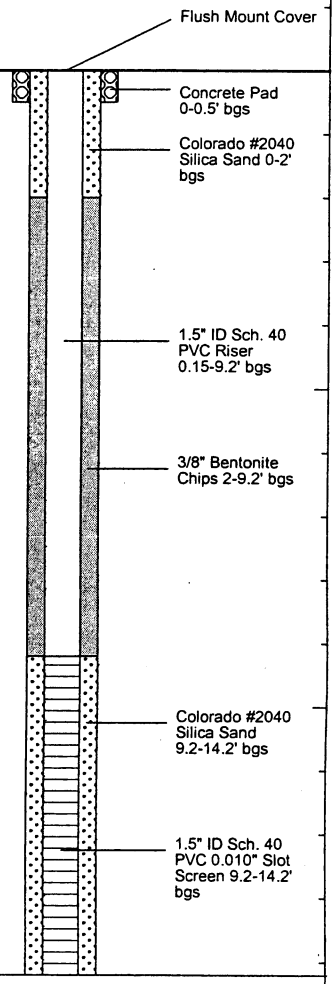
BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Samples collected 0.8-2', 8-10' and 10-12' bgs.
NA=Not Available/Not Applicable.

| | | |
|---|---|---|
| **Date Start/Finish:** 12/20/00<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift, Dennis Powney<br>**Drilling Method:** Direct Push<br>**Bit Size:**<br>**Auger Size:**<br>**Rig Type:** Geoprobe 66 DT Track Rig<br>**Sampling Method:** 2" diam. + disposable liner<br>**Hammer Weight:** | **Northing:** 567422.03<br>**Easting:** 13306396.35<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** 753.52<br><br>**Geologist:** Ron Kuhn, Shawn Kerr | **Well/Boring ID:** RFI-36-12<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | |
| 0 | | 1 | 0-0.8 | 0.8 | NA | | | | CONCRETE. |
| | | 2 | 0.8-2 | 1.0 | NA | 0.0 | | | Black fine foundry SAND, trace Silt, damp. |
| | 750 | 3 | 2-4 | 2.0 | NA | 0.0 | | | Brown fine SAND, trace SILT, loose, damp. |
| 5 | | 4 | 4-6 | 1.6 | NA | 0.3 | | | Black foundry SAND, trace Silt, damp. |
| | | 5 | 6-8 | 1.7 | NA | 0.0 | | | Orange-brown fine SAND, loose, damp. |
| | 745 | 6 | 8-10 | 1.5 | NA | 0.0 | | | |
| 10 | | 7 | 10-12 | 1.6 | NA | 0.0 | | | Orange-brown very fine SAND and SILT, saturated at 10'. |
| | 740 | 8 | 12-14 | 1.7 | NA | 0.0 | | | |
| 15 | | | | | | | | | |

Well/Boring Construction



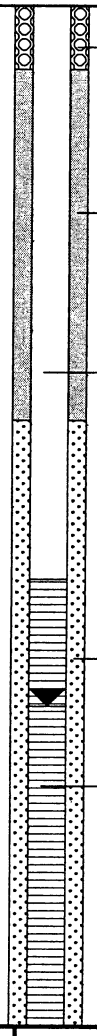

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Samples collected 0.8-2' and 8-10' bgs.
NA=Not Available/Not Applicable.

| | | |
|---|---|---|
| **Date Start/Finish:** 07/27/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID HSA<br>**Rig Type:** CME 55 | **Northing:** 566953.89<br>**Easting:** 13306632.24<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 751.81<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-13<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | FL | | ASPHALT. | PHA |
| | 750 | 1 | 1-3 | 4 4 7 12 | 11 | 2.0 | >10,000 | - | SM | | Black (10YR 2/1) Silty fine to coarse subrounded to subangular SAND and aggregate Gravel, few Clay, aplastic, no odor, loose, damp to dry. Fill mixed with Aggregate.<br>Silty SAND as above but no aggregate, damp, moderately loose. Foundry Sand. Fill. | SILTY SAND |
| | | 2 | 3-5 | 7 11 13 14 | 24 | 0.8 | >10,000 | - | CL | | Gray-brown (10YR 5/2) Silty CLAY, some to little fine to medium subangular to subrounded Gravel, few to trace fine to medium rounded Gravel; no odor, damp, soft. Glacial Till. | SILTY CLAY |
| 5 | | | | | | | | | SM | | Yellow-brown (10YR 5/6) Silty fine subangular to subrounded SAND, trace Clay, aplastic, no odor, moderately dense, damp. Fill. | SILTY SAND |
| | | 3 | 5-7 | 3 1 1 1 | 2 | 1.7 | >10,000 | - | ML | | Gray to dark gray (10YR 5/1 - 4/1) SILT, black (10YR 2/1) mottling, little fine subangular to subrounded Sand, few Clay, aplastic, no odor, moist, loose. | SILT |
| | 745 | 4 | 7-9 | 2 2 1/ 12" | 3 | 2.0 | >10,000 | - | | | Wet. | |
| 10 | | 5 | 9-11 | 4 7 9 11 | 16 | 2.0 | >10,000 | - | | | Becoming yellow-brown (10YR 5/6) to lower contact; decreased Clay to trace. | |
| | 740 | 6 | 11-13 | 5 5 3 8 | 8 | 1.5 | 4,437 | - | | | Saturated. | |
| | | 7 | 13-15 | 3 5 5 5 | 10 | 1.5 | 785 | - | | | | |
| 15 | | 8 | 15-17 | 5 5 | 11 | 1.2 | 474 | - | | | Becomes gray (10YR 6/1); decreased Sand to few, still saturated. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3', 5-7' and 9-11' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 07/27/01 | 11.0' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-13

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | 8 | 15-17 | 6<br>5 | 11 | 1.2 | 474 | - | ML | | Gray to dark gray (10YR 5/1 - 4/1) SILT, black (10YR 2/1) mottling, little fine subangular to subrounded Sand, few Clay, aplastic, no odor, moist, loose. | SILT | #5 Global Filter Sand Pack (6.5' - 19' bgs)<br>2" ID Sch. 40 PVC 0.010" Slot Screen (9.0' - 19' bgs) |
| | | 9 | 17-19 | 3<br>3<br>4<br>4 | 7 | 1.2 | 278 | - | | | Increased density, increased Clay to few (tighter). | | PVC Cap |
| 20 | | | | | | | | | | | | | |
| | 730 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3', 5-7' and 9-11' bgs.

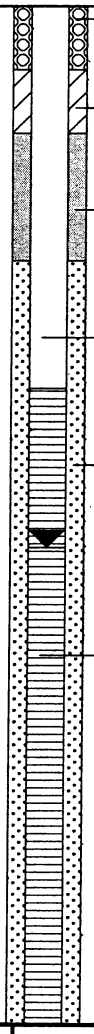
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 07/27/01 | 11.0' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/16/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 566905.12<br>**Easting:** 13306892.51<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 750.0<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-14<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | 1 | 0-2 | 8 6 4 3 | 10 | 1.1 | 0.0 | - | ML | | Dark gray-brown (10 YR 4/2) SILT, little fine to medium subangular Sand, little coarse to pebble-sized angular Gravel, roots present, aplastic, loose, no odor, dry. Topsoil and fill. | SILT |
| | | 2 | 2-4 | 3 4 6 10 | 10 | 1.1 | 0.0 | - | CL | | Gray (10 YR 6/1) CLAY, some Silt, little to few fine to medium subangular to subrounded Sand and Gravel, dark gray-brown (10 YR 4/2) mottling, medium stiff, no odor, dry to moist.<br>Becomes oxidized to (10 YR 5/6) to lower contact. | CLAY |
| 5 | 745 | 3 | 4-6 | 4 5 5 7 | 10 | 1.6 | 0.0 | - | SM | | Brown-yellow (10 YR 6/6) Silty fine subangular SAND, aplastic, dense, no odor, moist to dry. | SILTY SAND |
| | | 4 | 6-8 | 3 4 5 6 | 9 | 1.6 | 2.1 | - | | | Becomes moist to wet, color change to dark yellow-brown (10 YR 4/6), increased moisture with depth. | |
| | | 5 | 8-10 | 1 1 3 5 | 4 | 1.5 | 3.0 | - | | | Saturated. | |
| 10 | 740 | 6 | 10-12 | 6 9 9 10 | 18 | 1.6 | 0.9 | - | | | | |
| | | 7 | 12-14 | 2 2 2 3 | 4 | 1.0 | 0.0 | - | ML | | Gray (10 YR 6/1) SILT, some to little fine subangular Sand, aplastic, dense to moderately dense, no odor, saturated.<br>Little Clay present. | SILT |
| 15 | 735 | 8 | 14-16 | 5 5 4 5 | 9 | 1.3 | 0.2 | - | | | | |

**Boring Construction**



- Cement pad with 9" flush-mount cover
- Grout 1-2' bgs.
- Bentonite seal 2-4' bgs.
- 2" ID Sch. 40 PVC riser 0.2-6' bgs.
- #5 Global filter sandpack 4-18' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 6-16' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0-2' and 6-8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/16/01 | 8.5' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-14

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 3 6 6 10 | 12 | 1.6 | 2.1 | - | ML | | Gray (10 YR 6/1) SILT, some to little fine subangular Sand, little Clay, aplastic, dense to moderately dense, no odor, saturated. | SILT | #5 Global filter sandpack 4-18' bgs. |
| | 20 730 | | | | | | | | | | | | |
| | 25 725 | | | | | | | | | | | | |
| | 30 720 | | | | | | | | | | | | |
| | 35 715 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0-2' and 6-8' bgs.

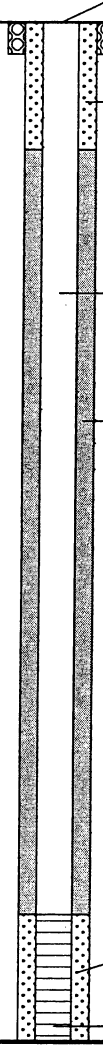
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/16/01 | 8.5' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/20/00<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift, Dennis Powney<br>**Drilling Method:** Direct Push<br>**Bit Size:**<br>**Auger Size:**<br>**Rig Type:** Geoprobe 66 DT Track Rig<br>**Sampling Method:** 2" diam. + disposable liner<br>**Hammer Weight:** | **Northing:** 567876.79<br>**Easting:** 13306374.8<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** 754.47<br><br>**Geologist:** Ron Kuhn, Shawn Kerr | **Well/Boring ID:** RFI-36-15<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | |
| 0 | | | | | | | | | CONCRETE. |
| | | 1 | 0-0.8 | 0.8 | | | | | Orange-brown to dark brown fine SAND, little Silt. |
| | | 2 | 0.8-2 | 1.2 | | 0.0 | | | Orange-brown mottled Clayey SILT, stiff, moist. |
| | | 3 | 2-4 | 2.0 | | 0.0 | | | As above with trace fine Sand. |
| 5 | 750 | 4 | 4-6 | 2.0 | | 0.0 | | | |
| | | 5 | 6-8 | 2.0 | | 0.0 | | | |
| | | 6 | 8-10 | 2.0 | | 0.0 | | | Orange-brown fine SAND, trace Silt, loose, damp. |
| 10 | 745 | 7 | 10-12 | 1.5 | | 0.0 | | | |
| | | 8 | 12-14 | 1.8 | | 0.0 | | | |
| 15 | 740 | 9 | 14-16 | 1.6 | | 0.0 | | | Orange-brown to gray-brown fine SAND, loose, wet, clear NAPL present. |

Well/Boring Construction




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Samples collected 0.8-2', 8-10' and 14-16' bgs.
MS/MSD collected between 14'-16'
CN = clear NAPL

**Client:**
General Motors

**Site Location:**
GM-Flint - Focused RFI
Factory 36, Building 36

**Well/Boring ID:** RFI-36-15

**Borehole Depth:** 20' bgs

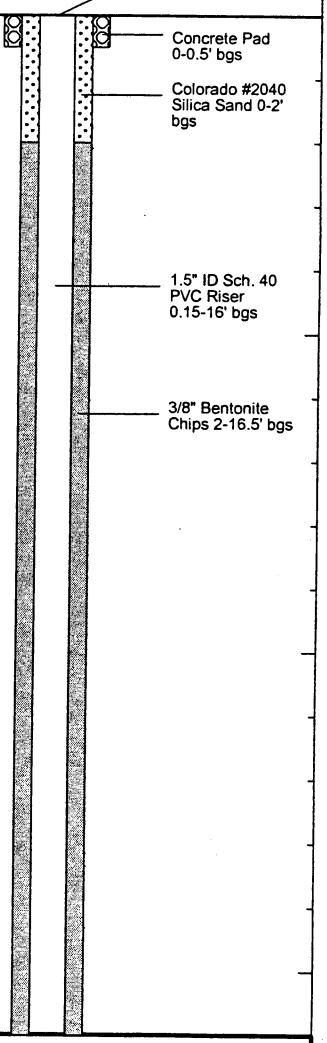
| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 16-18 | 2.0 | + CN | 0.0 | | | Gray-brown very fine SAND, saturated, loose. | bgs<br>Colorado #2040 Silica Sand 14-19.5' bgs |
| | 735 | 11 | 18-20 | 2.0 | + CN | 0.0 | | | Gray-brown very fine SAND and SILT, saturated, loose. | 1.5" ID Sch. 40 PVC 0.010" Slot Screen 14'-19.5' bgs |
| 20 | | | | | | | | | | |
| | 730 | | | | | | | | | |
| 25 | | | | | | | | | | |
| | 725 | | | | | | | | | |
| 30 | | | | | | | | | | |
| | 720 | | | | | | | | | |
| 35 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Samples collected 0.8-2', 8-10' and 14-16' bgs.
MS/MSD collected between 14'-16'.
CN = clear NAPL

| | | |
|---|---|---|
| **Date Start/Finish:** 12/19-20/00<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift, Dennis Powney<br>**Drilling Method:** Direct Push<br>**Bit Size:** NA<br>**Auger Size:** NA<br>**Rig Type:** Geoprobe 66 DT Track Rig<br>**Sampling Method:** 2" diam. + disposable liner<br>**Hammer Weight:** | **Northing:** 567963.9<br>**Easting:** 13306554.15<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 24' bgs<br>**Surface Elevation:** 754.87<br><br>**Geologist:** Ron Kuhn | **Well/Boring ID:** RFI-36-16<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 755 | 1 | 0-0.9 | 0.9 | | 0.0 | | | CONCRETE. |
| | | 2 | 0.9-2 | 1.0 | - | 0.0 | | | Dark gray to black foundry fine Sand, trace Silt, slight odor, loose, damp. |
| | | 3 | 2-4 | 2.0 | | 0.0 | | | Olive-brown to orange-brown Clayey SILT, trace very fine Sand, damp. |
| 5 | 750 | 4 | 4-6 | 2.0 | | 0.0 | | | |
| | | 5 | 6-8 | 2.0 | | 0.0 | | | |
| | | 6 | 8-10 | 2.0 | | 0.0 | | | Light brown fine SAND, trace Silt, loose, damp. |
| 10 | 745 | 7 | 10-12 | 1.6 | | 0.0 | | | |
| | | 8 | 12-14 | 1.6 | + CN | 0.5 | | | Same as above with slight odor, trace of clear NAPL. |
| 15 | 740 | 9 | 14-16 | 2.0 | + CN | 0.0 | | | Gray-brown very fine SAND, trace Silt, slight odor, loose, trace clear NAPL, damp. |




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Samples collected 0.9-2', 8-10' and 18-20' bgs.
CN = Clear NAPL; + = Positive Test Result.

**Client:**
General Motors

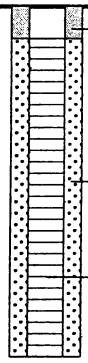
**Site Location:**
GM-Flint - Focused RFI
Factory 36, Building 36

**Well/Boring ID:** RFI-36-16

**Borehole Depth:** 24' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 16-18 | 2.0 | + CN | 0.0 | | | Gray-brown very fine SAND and SILT grading to gray-brown Clayey SILT@17'. |
| | | | | | | | | | Same as above @ 17'. |
| | | 11 | 18-20 | 2.0 | + CN | 0.0 | | | |
| 20 | 735 | | | | | | | | Gray-brown fine SAND, saturated @ 19.5' |
| | | | | | | | | | Gray-brown very fine SAND and SILT, saturated. |
| | | 12 | 20-22 | 2.0 | + CN | 0.0 | | | |
| | | 13 | 22-24 | 2.0 | + CN | 0.0 | | | |
| 25 | 730 | | | | | | | | |
| 30 | 725 | | | | | | | | |
| 35 | 720 | | | | | | | | |

Well/Boring Construction



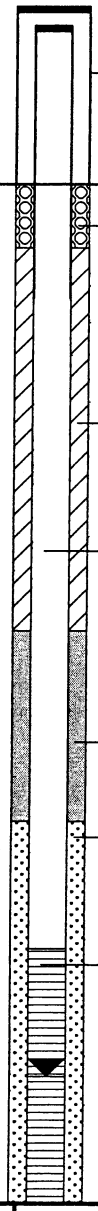

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Samples collected 0.9-2', 8-10' and 18-20' bgs.
CN = Clear NAPL; + = Positive Test Result.

| | | |
|---|---|---|
| **Date Start/Finish:** 08/29/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 568281.97<br>**Easting:** 13307453.17<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 22' bgs<br>**Surface Elevation:** 753.93<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-17<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 6 9 10 12 | 19 | 1.5 | 0.0 | - | | | Dark gray-brown (10YR 4/2) SILT, little Clay and fine to coarse subrounded to subangular Sand, few fine to coarse rounded Gravel, coarse large angular Gravel and Cobbles (Fill), aplastic , organic matter such as vegetation and roots present, earth odor, damp to dry, moderately loose to moderately dense. Topsoil. | |
| | | 2 | 2-4 | 4 8 10 12 | 18 | 1.2 | 0.0 | - | ML | | Pale brown (10YR 6/3) SILT, some Clay, few fine to coarse subangular to subrounded Sand, trace fine rounded to subrounded Gravel; aplastic, heavily oxidized and bleached, no odor, dense, dry, friable. Glacial Till. | SILT |
| | 750 | | | | | | | | | | | |
| 5 | | 3 | 4-6 | 4 4 5 5 | 9 | 1.4 | 0.0 | - | | | Light yellow-brown (10YR 6/4) SILT, little to locally some Clay in patches, some to little fine subangular Sand; aplastic, no odor, damp, moderately dense. Glacial-alluvial. | |
| | | 4 | 6-8 | 2 4 4 4 | 8 | 2.0 | 0.0 | - | | | Pale brown (10YR 6/3) fine to medium subrounded to subangular SAND, locally a Silty Sand (SM), some Silt, few to trace Clay; aplastic, no odor, damp, moderately loose. Glacial-alluvial. | |
| | 745 | 5 | 8-10 | 2 4 4 3 | 8 | 1.4 | 0.0 | - | | | | |
| 10 | | 6 | 10-12 | 2 4 5 5 | 9 | 1.8 | 0.0 | - | SP | | Moist with increasing moisture with depth. | SAND |
| | | 7 | 12-14 | 5 6 5 5 | 11 | 1.6 | 0.0 | - | | | Fining downward and becoming gray. | |
| | 740 | | | | | | | | | | | |
| 15 | | 8 | 14-16 | 5 7 8 6 | 15 | 2.0 | 0.0 | - | | | Saturated. Yellow-brown (10YR 5/4). | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** a/bgs = above/below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2', 8-10' and 12-14' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/29/01 | 14.0' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-17

**Borehole Depth:** 22' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 2 5 7 8 | 12 | 1.7 | 0.0 | - | SP | | Pale brown (10YR 6/3) fine to medium subrounded to subangular SAND, locally a Silty Sand (SM), some Silt, few to trace Clay; aplastic, no odor, damp, moderately loose. Glacial-alluvial. | SAND | #5 Global Filter Sand Pack 10-22' bgs |
| | 735 | 10 | 18-20 | 3 4 5 6 | 9 | 1.8 | 0.0 | - | | | | | 2" ID Sch. 40 PVC 0.010" Slot Screen 12-22' bgs |
| 20 | | 11 | 20-22 | 2 3 2 2 | 5 | | 0.0 | - | ML | | Gray (10YR 6/1) SILT, little fine subangular Sand, little Clay; aplastic, no odor, moderately loose to moderately dense, saturated. Glacial-alluvial. | SILT | PVC Cap |
| | 730 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** a/bgs = above/below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2', 8-10' and 12-14' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/29/01 | 14.0' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 8/30/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 567949.67<br>**Easting:** 13307448.28<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 24' bgs<br>**Surface Elevation:** 753.12<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-18<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 4 6 10 12 | 16 | 1.8 | 0.0 | - | | | Light yellow-brown (10 YR 6/4) SILT, some Clay, little fine to coarse subangular to subrounded Sand, trace fine subrounded Gravel, aplastic, dense, friable, no odor, dry. Organic matter and root structures present to 1' bgs. Topsoil | |
| | | | | | | | | | | | Yellow-brown (10 YR 6/4) SILT, as at 0-1.0' bgs, aplastic, heavily oxidized and weathered glacial till. | |
| | 750 | 2 | 2-4 | 4 7 9 11 | 16 | 1.6 | 0.0 | - | ML | | Yellow-brown (10 YR 5/6) SILT, some to little fine subangular Sand, few Clay, aplastic, moderately dense to dense, no odor, damp. Glacial-alluvial. | SILT |
| 5 | | 3 | 4-6 | 3 6 9 9 | 15 | 1.4 | 0.0 | - | | | Light yellow-brown (10 YR 6/4) Silty fine to medium subangular SAND, few Clay, aplastic, no odor, moderately dense, damp. Glacial-alluvial. Occasional silt lenses up to 4" wide throughout. | |
| | | 4 | 6-8 | 4 5 7 8 | 12 | 1.6 | 0.0 | - | | | | |
| | 745 | 5 | 8-10 | 2 3 2 3 | 5 | 1.4 | 0.0 | - | | | | |
| 10 | | 6 | 10-12 | 1 3 2 3 | 5 | 1.4 | 0.0 | - | SM | | | SILTY SAND |
| | 740 | 7 | 12-14 | 2 2 5 8 | 7 | 1.6 | 0.0 | - | | | Increasing moisture with depth, decreased clay to none to trace. | |
| 15 | | 8 | 14-16 | 1 2 2 4 | 4 | 1.4 | 0.0 | - | | | Saturated. | |

**Boring Construction**

- Cement pad with 9" diam. flush-mount cover.
- Grout 1-10' bgs
- 2" ID Sch. 40 PVC riser 0.2-14' bgs.
- Bentonite seal 10-12' bgs
- Global #5 sandpack 12-24' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 14-24' bgs

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0-2', 8-10' and 12-14' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/30/01 | 14.0' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-18

**Borehole Depth:** 24' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 4 4 3 4 | 7 | 1.4 | 1.4 | - | SM | | Light yellow-brown (10 YR 6/4) Silty fine to medium subangular SAND, few Clay, aplastic, no odor, moderately dense, damp. Glacial-alluvial. | SILTY SAND | Global #5 sandpack 12-24' bgs. |
| | 735 | 10 | 18-20 | 1 2 3 4 | 5 | 1.5 | 1.5 | - | | | Becomes gray-brown (10 YR 5/2), fine subangular to subrounded Sand, trace Clay. | | 2" ID Sch. 40 PVC 0.010" slotted screen 14-24' bgs |
| 20 | | 11 | 20-22 | 1 1 1 6 | 2 | 1.7 | 1.7 | - | | | Fining downward to lower contact. | | |
| | 730 | 12 | 22-24 | 3 3 3 3 | 6 | 1.3 | 1.3 | - | ML | | Gray (10 YR 5/1) SILT, some Clay, little fine to medium subangular to subrounded Sand, no odor, moderately dense, saturated. Glacial-alluvial. | SILT | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0-2', 8-10' and 12-14' bgs.

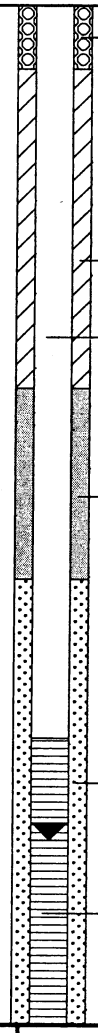
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/30/01 | 14.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 8/28/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4" ID HSA<br>**Rig Type:** CME 55 | **Northing:** 567519.98<br>**Easting:** 13307356.55<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 22' bgs<br>**Surface Elevation:** 753.31<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-19<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | | |
| 0 | | NA | NA | NA | NA | NA | NA | NA | ML | | Light brownish-green (10YR 6/2) SILT, some fine to coarse subangular to subrounded Sand, little Clay, aplastic, no odor, dry, loose. Vegetation and roots present. Topsoil mixed with coarse angular aggregate. Fill. | SILT |
| | | | | | | | | | | | Dark yellow-brown (10YR 4/6) SILT, little fine to medium subangular to subrounded Sand, some Clay, aplastic, no odor, moderately loose, dry. Heavily oxidized. Weathered Glacial Till. | |
| | 750 | | | | | | | | CL | | Dark yellow-brown (10YR 4/6) Silty CLAY, little fine to medium subangular to subrounded Sand, few fine to coarse subrounded to rounded Gravel, very stiff, no odor, dry to damp, heavily oxidized. Weathered Glacial Clay Till. | SILTY CLAY |
| 5 | | | | | | | | | | | | |
| | | | | | | | | | SM | | Yellow-brown (10YR 5/2) Silty fine to medium subrounded to subangular SAND, few Clay with increases of Clay content to little in patches, moderately dense, dry, heavily oxidized. Glacial-alluvial. | SILTY SAND |
| | 745 | 1 | 8-10 | 4<br>7<br>12<br>14 | 19 | 1.4 | 0.0 | - | | | Light yellow-brown (10YR 6.2), decreased Clay content to trace. | |
| 10 | | 2 | 10-12 | 4<br>7<br>14<br>13 | 21 | 1.4 | 0.0 | - | | | Damp, increased moisture. | |
| | 740 | 3 | 12-14 | 2<br>4<br>7<br>8 | 11 | 1.6 | 0.0 | - | ML | | Yellow-brown (10YR 5/4) SILT, some Clay; aplastic, moist, no odor, dense to moderately dense. Glacial-alluvial. Saturated at 13.1' bgs. | SILT |
| 15 | | 4 | 14-16 | 4<br>6<br>6<br>7 | 12 | 1.8 | 0.0 | - | SM | | Yellow-brown (10YR 6/4) Silty fine to medium subrounded to subangular SAND, trace Clay; moderately dense, moist, heavily oxidized. Occasional shell fragments. Alluvial. | SILTY SAND |

**Boring Construction**



- Portland cement 0-1' bgs
- Grout 1-6' bgs
- 2" ID Sch. 40 PVC Riser 0.2-11.5' bgs
- Bentonite Seal 6-9' bgs
- #5 Global Filter Sand Pack 9-22' bgs
- 2" Sch. 40 PVC 0.010" Slot Screen 11.5-21.5' bgs

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0-2', 8-10' and 10-12' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/28/01 | 13.1 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-19

**Borehole Depth:** 22' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5 | 16-18 | 6 7 7 6 | 14 | 1.5 | 0.0 | - | SM | | Yellow-brown (10YR 6/4) Silty SAND, fine to medium subrounded to subangular Sand, trace Clay; moderately dense, moist, heavily oxidized. Alluvial. Occasional shell (?) fragments. | SILTY SAND | 2" Sch. 40 PVC 0.010" Slot Screen 11.5-21.5' bgs |
| | 735 | 6 | 18-20 | 4 7 7 8 | 14 | 1.7 | 0.0 | - | | | Yellow-brown (10YR 5/4). | | #5 Global Filter Sand Pack 9-22' bgs |
| 20 | | 7 | 20-22 | 6 6 8 9 | 14 | 1.6 | 0.0 | - | | | Becoming gray (10YR 5/1) and fining downwards. | | PVC Cap |
| | 730 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0-2', 8-10' and 10-12' bgs.

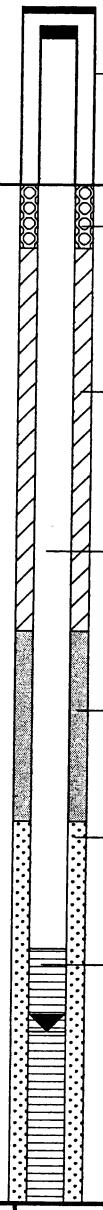
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/28/01 | 13.1 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 08/28/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 567365.48<br>**Easting:** 13307195.23<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 24' bgs<br>**Surface Elevation:** 757.01<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-20<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 760 | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 10 12 15 16 | 27 | 1.3 | 12.8 | - | ML | | Brown (10YR 4/3) SILT, some fine to coarse subangular to subrounded Sand, little Clay, few fine to coarse subrounded to rounded Gravel, aplastic, earthy odor, moderately loose, damp with rainfall. Organic matter such as roots and vegetation present. Topsoil. | SILT |
| | 755 | 2 | 2-4 | 7 9 11 12 | 20 | 1.2 | 4.4 | - | | | Pale brown (10YR 6/3) SILT, some Clay, few fine to coarse subrounded to subangular Sand, trace fine rounded Gravel, aplastic, no odor, dense, dry, friable. Heavily oxidized and bleached throughout. Weathered Glacial Till. | |
| 5 | | 3 | 4-6 | 4 5 3 4 | 8 | 1.5 | 0.0 | - | | | Becomes damp, yellow-brown (10YR 5/4). | |
| | 750 | 4 | 6-8 | 2 3 4 5 | 7 | 1.9 | 0.0 | - | CL | | Yellow-brown (10YR 5/4) Silty CLAY, little fine to coarse subangular to subrounded Sand, trace fine rounded to subrounded Gravel; soft to medium stiff, no odor, damp, heavily oxidized. Glacial Clay Till. | SILTY CLAY |
| | | 5 | 8-10 | 2 4 5 5 | 9 | 1.8 | 0.0 | - | SM | | Brown-yellow (10YR 6/8) Silty SAND, fine subangular Sand, few Clay; aplastic, no odor, damp, moderately dense, local patches of increased Clay content to little. Glacial-alluvial. | SILTY SAND |
| 10 | | 6 | 10-12 | 2 4 6 7 | 10 | 1.5 | 0.0 | - | | | Becomes light yellow-brown (10YR 6/4) at 8.0' bgs. | |
| | 745 | 7 | 12-14 | 4 6 9 10 | 17 | 1.6 | 0.0 | - | | | Moist. | |
| 15 | | 8 | 14-16 | 2 3 3 3 | 6 | 1.7 | 0.0 | - | ML | | Saturated. | |
| | | | | | | | | | | | Gray (10YR) 5/1 SILT, heavily oxidized at upper contact to yellow-brown (10YR 5/6) little Clay; aplastic, no odor, saturated, dense. Glacial-alluvial. | SILT |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** a/bgs = above/below ground surface
NA = Not Applicable/Not Available
Samples collected 0-2', 8-10' and 10-12' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/28/01 | 13.3' bgs | |

**Client:**
General Motors

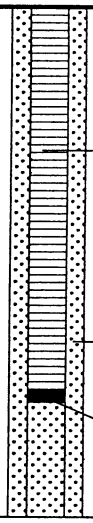
**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-20

**Borehole Depth:** 24' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | 9 | 16-18 | 6 6 7 7 | 13 | 1.6 | 0.0 | - | ML | | Gray (10YR 5/1) SILT, heavily oxidized at upper contact to yellow-brown (10YR 5/6) little Clay; aplastic, no odor, saturated, dense. Glacial-alluvial. | SILT |
| | | 10 | 18-20 | 1 3 4 6 | 7 | 1.3 | 0.0 | - | SP | | Dark yellow-brown (10YR 6/4) fine to medium subangular to subrounded SAND, some to little Silt; aplastic, no odor, saturated, moderately dense, shell fragments (?) present. Alluvial from moderately high energy environment of deposition. Fining downwards after 22.5' bgs to lower contact. | SAND |
| 20 | | 11 | 20-22 | 1 3 5 9 | 8 | 1.6 | 0.0 | - | | | | |
| | 735 | 12 | 22-24 | 4 5 5 4 | 10 | 2.0 | 0.0 | - | SM | | Gray (10YR 5/1) SILT, few fine subangular to subrounded Sand, little Clay; aplastic, no odor, saturated, dense. Glacial-alluvial. | SILT |
| 25 | | | | | | | | | | | | |
| | 730 | | | | | | | | | | | |
| 30 | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | |
| 35 | | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** a/bgs = above/below ground surface
NA = Not Applicable/Not Available
Samples collected 0-2', 8-10' and 10-12' bgs.

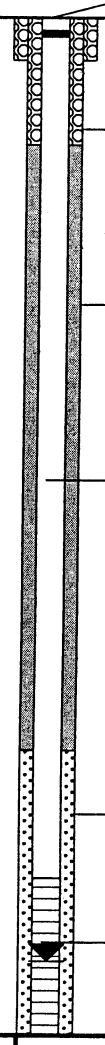
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/28/01 | 13.3' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 3/27/01 - 3/27/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:**<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 567883.06<br>**Easting:** 13306850.34<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 754.64<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-21<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | |
| 0 | | | | | | | FL | | Concrete. | FILL |
| | | 1 | 0-2 | 1.4 | 8.8 | - | | | Black (10 YR 2/1) SILT, little fine to medium subangular Sand, few Clay, aplastic, no odor, dry to damp, moderately dense. | SILT |
| | | 2 | 2-4 | 2.0 | 50.3 | - | | | Brown (10 YR 5/3) SILT, some Clay, little fine to medium subangular Sand, trace fine to medium subrounded Gravel, no odor, dry, dense, local increases in clay to a silty clay. | |
| | 750 | 3 | 4-6 | 2.0 | 20.8 | - | ML/CL | | | |
| 5 | | 4 | 6-8 | 2.0 | 38.6 | - | | | 1" wide black Silt lens. | |
| | | 5 | 8-10 | 1.4 | 55.9 | - | | | Brown (10 YR 5/3) SILT and very fine SAND, little fine to medium subangular Sand, few Clay, aplastic, no odor, dry, moderately dense to moderately loose. | SILT & SAND |
| | 745 | | | | | | | | | |
| 10 | | 6 | 10-12 | 1.6 | 23.7 | - | ML/SP | | | |
| | | 7 | 12-14 | 1.5 | 19.2 | - | | | | |
| | 740 | | | | | | | | | |
| 15 | | 8 | 14-17 | 2.6 | 20.7 | + | SP | | Gray-brown (10 YR 5/2) fine to medium subangular SAND, little Silt, little Clay, aplastic, moderate to weak odor, moderately dense to moderately loose, saturated. | |
| | | | | | | | ML | | | SILT |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
+ = Positive Shake Test
Samples collected 6-8', 8-10', 10-12', and 12-14' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/27/01 | 14.8 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-21

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 14-17 | 2.6 | 20.7 | + | ML ML | | SILT, as above at 3.1 to 7.8', wet, moderate to weak odor. | SILT | #5 well sand - K&E well gravel 11.5-19' bgs |
| | | 9 | 17-19 | 1.9 | 35.3 | + | SP | | SAND, as above at 14.8 to 15.3'. | SAND | 1.5" ID Sch. 40 PVC 0.010" Slot Screen 13.5-18.5' bgs; 1.5" ID Sch. 40 PVC bottom cap |
| 20 | 735 | | | | | | | | | | |
| 25 | 730 | | | | | | | | | | |
| 30 | 725 | | | | | | | | | | |
| 35 | 720 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
+ = Positive Shake Test
Samples collected 6-8', 8-10', 10-12', and 12-14' bgs.

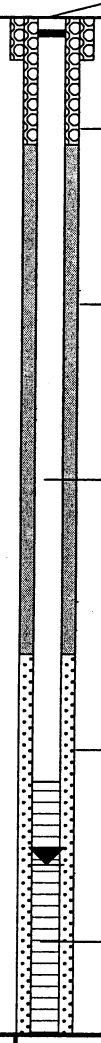
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/27/01 | 14.8 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 3/27/01 - 3/27/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:**<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 567808.88<br>**Easting:** 13306655.18<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 754.37<br><br>**Descriptions By:** S. Duly | **Boring ID:** RFI-36-22<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | |
| 0 | | | | | | | FL | | Concrete. | FILL |
| | | 1 | 0-2 | 1.4 | 9.6 | - | | | Yellow-brown (10 YR 5/4) SILT, some fine to medium subangular Sand, little to few Clay, aplastic, no odor, dry to damp, moderately loose to moderately dense. | |
| | | | | | | | | | Black (10 YR 2/1) SILT, few to little Clay, no odor, dry, moderately dense to dense. | |
| | | 2 | 2-4 | 2.0 | 12.1 | - | | | Brown (10 YR 5/3) SILT, little fine to medium subangular Sand, some Clay, aplastic, dry to damp, dense, brittle. Locally becoming a silty clay with increased clay content. | SILT |
| | 750 | | | | | | | | | |
| 5 | | 3 | 4-6 | 2.0 | 11.2 | - | ML/CL | | | |
| | | 4 | 6-8 | 2.0 | 11.8 | - | | | | |
| | | 5 | 8-10 | 1.8 | 399 | - | | | SILT, as above, with little to few Clay, some fine to medium subangular Sand. | |
| | 745 | | | | | | | | | |
| 10 | | | | | | | | | Brown SAND and SILT, little Clay, very fine to medium Sand, aplastic, no odor, dry to damp, moderately dense. | SAND and SILT |
| | | 6 | 10-12 | 1.7 | 67.4 | - | | | | |
| | | 7 | 12-14 | 1.8 | 40.8 | + | | | Increased clay to little, moderate odor. | |
| | 740 | | | | | | SP/ML | | | |
| 15 | | 8 | 14-16 | 1.7 | 29.0 | - | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs=below ground surface
+ = Positive Shake Test
NA=Not Applicable/Not Available
Samples collected 0-2', 8-10' and 10-12' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/27/01 | 13.3 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-22

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 2.0 | 10.3 | - | SP/ML | | Brown SAND and SILT, little Clay, very fine to medium Sand, aplastic, no odor, dry to damp, moderately dense. | SAND and SILT | #5 well sand - K&E well gravel 10-18' bgs; 1.5" ID Sch. 40 PVC bottom cap |
| 20 | 735 | | | | | | | | | | |
| 25 | 730 | | | | | | | | | | |
| 30 | 725 | | | | | | | | | | |
| 35 | 720 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs=below ground surface
+ = Positive Shake Test
NA=Not Applicable/Not Available
Samples collected 0-2', 8-10' and 10-12' bgs.

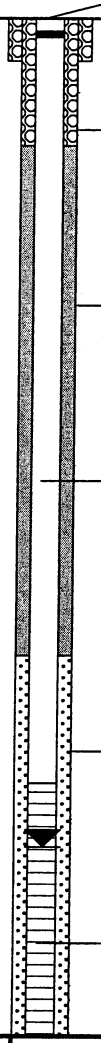
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/27/01 | 13.3 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 3/27/01 - 3/27/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:**<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 567761.27<br>**Easting:** 13306516.24<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 754.2<br><br>**Descriptions By:** S. Duly | **Boring ID:** RFI-36-23<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | |
| 0 | | | | | | | FL | Concrete. | FILL |
| | | 1 | 0-2 | 1.2 | 15.2 | + | SP | Brown (10 YR 4/3) fine to medium subangular SAND, some Silt, little to locally some Clay, aplastic, no odor, damp to dry, moderately dense. | SAND |
| | | | | | | | ML | Very dark gray-brown (10 YR 3/2) SILT, some Clay, little to some fine to medium subangular Sand, no odor, dry, dense. | SILT & CLAY |
| | | 2 | 2-4 | 1.5 | 15.7 | - | CL | Brown (10 YR 4/3) Silty CLAY, little to some fine to medium subangular Sand, plastic, no odor, moist, soft. | |
| | 750 | | | | | | | | |
| 5 | | 3 | 4-6 | 1.5 | 26.8 | - | | SAND, as above at 0.6 to 1.8'.<br>Black (10 YR 2/1) SILT, little Clay, trace fine to medium subangular Sand, no odor, dry, moderately dense to loose. | |
| | | 4 | 6-8 | 1.6 | 63.0 | + | | | |
| | 745 | 5 | 8-10 | 1.5 | 14.1 | - | | Yellow-brown (10 YR 5/4) SILT, some to little Clay, little fine to medium Sand, moderate odor, damp, moderately dense. | |
| 10 | | | | | | | ML | 10-10.5': Silt alternating with black silt and silty clay lenses up to 1" wide. | |
| | | 6 | 10-12 | 2.0 | 118.5 | - | | | |
| | | 7 | 12-14 | 1.6 | 66.7 | + | | No odor, saturated. | |
| | 740 | | | | | | | Weak odor. | |
| 15 | | 8 | 14-16 | 1.6 | 18.3 | - | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
+ = Positive Test Result
Samples collected 0-2', 8-10' and 10-12' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/27/01 | 13.0 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-23

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 2.0 | 210 | + | ML | | Yellow-brown (10 YR 5/4) SILT, some to little Clay, little fine to medium Sand, moderate odor, damp, moderately dense. | SILT & CLAY | #5 well sand - K&E well gravel 10-18' bgs; 1.5" ID Sch. 40 PVC bottom cap |
| 20 | 735 | | | | | | | | | | |
| 25 | 730 | | | | | | | | | | |
| 30 | 725 | | | | | | | | | | |
| 35 | 720 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
+ = Positive Test Result
Samples collected 0-2', 8-10' and 10-12' bgs.

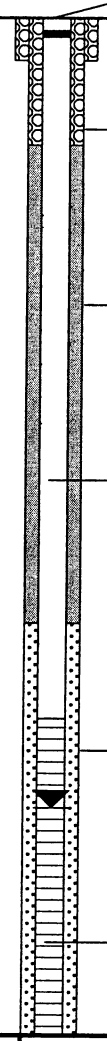
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/27/01 | 13.0 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 3/26/01 - 3/26/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:**<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 567686.05<br>**Easting:** 13306390.25<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 754.05<br><br>**Descriptions By:** S. Duly | **Boring ID:** RFI-36-24<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | |
| 0 | | | | | | | FL | | Concrete. | FILL |
| | | 1 | 0-2 | 1.8 | 8.0 | - | ML | | Black (10 YR 2/1) to very dark gray-brown (10 YR 3/2) SILT, some fine to medium subangular Sand, little to few Clay, trace fine to coarse rounded Gravel, aplastic, no odor, dry to damp, moderately dense to dense. | SILT |
| | | 2 | 2-4 | 1.0 | 6.0 | + | | | | |
| | 750 | | | | | | | | | |
| 5 | | 3 | 4-6 | 0.8 | 5.2 | + | | | | |
| | | 4 | 6-8 | 1.1 | 358 | - | SP | | Gray (10 YR 5/1) fine subangular SAND, some Silt, little Clay, aplastic, dry, moderately dense. | SAND |
| | | | | | | | ML | | SILT, as above, but with some Clay, dry to damp. | SILT |
| | 745 | 5 | 8-10 | 2.0 | 72.2 | - | | | | |
| 10 | | 6 | 10-12 | 1.9 | 101 | - | | | 10.3-10.4': As above, but black (10 YR 2/1). | |
| | | 7 | 12-14 | 1.8 | 52.9 | + | SP | | Gray-brown (10 YR 5/2) SAND, some Silt, little Clay, trace fine to coarse rounded Gravel, weak odor, wet, moderately dense.<br>12.9'-Collapse, water and product detected prior to collapse | SAND |
| | 740 | | | | | | | | | |
| 15 | | 8 | 14-17 | 3.0 | NA | + | | | | |

Boring Construction




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA=Not Applicable/Not Available
Samples collected 0-2', 6-8', 8-10' and 10-12' bgs.
+ = Positive Test Result

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/26/01 | 12.4 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-24

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 14-17 | 3.0 | NA | + | SP | | Gray-brown (10 YR 5/2) SAND, some Silt, little Clay, trace fine to coarse rounded Gravel, weak odor, wet, moderately dense. | | 1.5" ID Sch. 40 PVC bottom cap; #5 well sand - K&E well gravel 9.5'-17' bgs |
| | 735 | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| | 730 | | | | | | | | | | |
| 25 | | | | | | | | | | | |
| | 725 | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| | 720 | | | | | | | | | | |
| 35 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA=Not Applicable/Not Available
Samples collected 0-2', 6-8', 8-10' and 10-12' bgs.
+ = Positive Test Result

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/26/01 | 12.4 | |

Project: 64410.011
Data File:RFI-36-24.dat
Template: j:\rockware\logplot2001\logfiles\64410\geoprobe.ldf
Date: 8/10/01

| | | |
|---|---|---|
| **Date Start/Finish:** 3/27/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** NA<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 45 Truck-mount | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** B. Loomis | **Boring ID:** RFI-36-25<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-2 | NA<br>NA<br>2<br>2 | 2 | 1.3 | 9.5 | - | FL<br>SW<br>CL | | ASPHALT<br>Dark brown SAND and rounded GRAVEL, trace Silt and Clay.<br>Gray SAND and rounded GRAVEL, trace Silt and Clay.<br>Brown stiff CLAY, trace Sand, gray mottling. | CLAY | Borehole backfilled with bentonite to grade. |
| | | 2 | 2-4 | 5<br>6<br>7<br>8 | 13 | 1.7 | 9.0 | - | | | Brown firm CLAY, trace rounded Pebbles, some Sand. | | |
| 5 | 5 | 3 | 4-6 | 5<br>6<br>9<br>11 | 15 | 1.8 | 5.5 | - | SW<br>CL | | Dark brown fine SAND with brown Clay and rounded Gravel.<br>Brown firm CLAY with rounded Gravel, trace red mottling. | CLAY | |
| | | 4 | 6-8 | 4<br>4<br>5<br>5 | 9 | 1.8 | 5.6 | - | SP | | Brown fine to medium SAND. | SAND | |
| | | 5 | 8-10 | 2<br>3<br>4<br>7 | 7 | 1.6 | 1.1 | - | | | Light brown fine to medium SAND. | | |
| 10 | 10 | 6 | 10-12 | 10<br>11<br>19<br>15 | 30 | 1.6 | 2.3 | - | | | Brown fine SAND with Silt.<br>Gray-brown fine SAND with Silt. | | |
| | | 7 | 12-14 | 9<br>12<br>14<br>10 | 26 | 2.0 | 1.4 | - | | | Gray-brown fine SAND, little Silt.<br>Gray fine SAND, moist to wet. | | |
| 15 | 15 | 8 | 14-16 | 6<br>4<br>4<br>7 | 8 | 2.0 | 5.9 | - | | | Saturated. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0-2', 8-10' and 10-12' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/27/01 | 14.0' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-25

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | NA | NA | NA | NA | - | SP | | Gray fine SAND, saturated. | SAND | Borehole backfilled with bentonite to grade. |
| 20 | 20 | | | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0-2', 8-10' and 10-12' bgs.

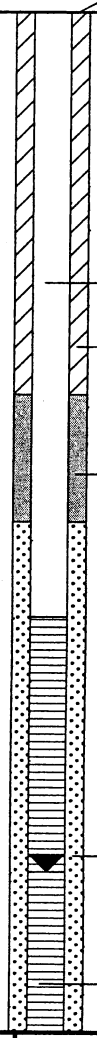
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/27/01 | 14.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/15/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rick Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID HSA<br>**Rig Type:** CME 45 Skid Rig | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19.5' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-25R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | Reinforced CONCRETE. | Fill |
| | | 1 | 1-3 | 8 8 11 13 | 19 | 1.4 | 0.0 | - | ML | | Black 10YR 2/1 SILT (ML), some fine to medium subangular Sand, few Clay, no odor, dense, aplastic, dry, locally lithified. Fill. | |
| | | 2 | 3-5 | 8 12 19 22 | 31 | 1.8 | 0.0 | - | CL | | Gray-brown, 10YR 5/2 Silty Lean CLAY (CL), few fine to coarse, subrounded to subangular Sand, few fine to medium subrounded Gravel, no odor, very stiff, weakly plastic, dry. Native Clay Till used as backfill. Occasional grey 10 YR 5/1 mottling. | |
| 5 | 5 | 3 | 5-7 | 3 7 9 12 | 16 | 2.0 | 0.0 | - | | | Becomes light yellow-brown 10 YR 6/4, with localized areas of bleaching to very pale brown 10YR 8/2. | |
| | | 4 | 7-9 | 6 10 12 15 | 22 | 2.0 | 0.0 | - | | | Becomes yellow-brown 10 YR 5/6. Weakly to moderately plastic, damp. | |
| 10 | 10 | 5 | 9-11 | 6 5 12 13 | 17 | 1.3 | 0.0 | - | SM | | Yellow-brown 10 YR 5/6 fine, poorly graded, subangular, Silty SAND (SM), few Clay, no odor, dense, aplastic, damp. Glacial alluvial. | Silty Sand |
| | | 6 | 11-13 | 11 20 22 37 | 42 | 1.6 | 6.0 | - | | | | |
| | | 7 | 13-15 | 15 14 14 16 | 28 | 1.5 | 0.0 | - | ML | | Gray-brown 10YR 5/2 SILT with Sand (ML), moist. | Silt |
| 15 | 15 | | NA | NA | NA | NA | NA | NA | SM | | Gray 10YR 5/1 Silty SAND (SM) as above, saturated. Glacial-alluvial. | Silty Sand |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 1-3', 7-9' and 11-13' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 12/15/01 | 13.5' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-25R

**Borehole Depth:** 19.5' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NA | NA | NA | NA | NA | NA | SM | | Gray 10YR 5/1 Silty SAND (SM) as above, saturated. Glacial-alluvial. | Silty Sand | Sand Pack (8'-19.5' bgs); 2" Diameter Slot 0.010 PVC Screen (9.5'-19.5') |
| 20 | 20 | | | | | | | | | | End of borehole. | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 1-3', 7-9' and 11-13' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 12/15/01 | 13.5' bgs | |

**Date Start/Finish:** 3/26/01 - 3/27/01
**Drilling Company:** Mateco
**Driller's Name:** Gary Swift
**Drilling Method:** Direct Push
**Sampler Size:** 2 ft cont. acetate sleeve
**Auger Size:**
**Rig Type:** 66 DT Advance Geoprobe

**Northing:** NA
**Easting:** NA
**Casing Elevation:** NA

**Borehole Depth:** 18' bgs
**Surface Elevation:** NA

**Descriptions By:** S. Duly

**Boring ID:** RFI-36-26

**Client:** General Motors

**Location:** GM Flint
Flint, Michigan

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | FL | | Concrete. | FILL | |
| | | 1 | 0-2 | 1.6 | 6.6 | - | SP | | Dark gray-brown (10 YR 4/3) fine to medium subangular SAND, some Silt, few Clay, aplastic, no odor, dry to damp, dense to loose. | | |
| | | | | | | | ML | | Black (10 YR 2/1) SILT, little fine to medium subangular Sand, few Clay, no odor, dry, dense. | SILT | |
| | | 2 | 2-4 | 1.4 | 118 | - | | | | | Borehole backfilled with Bentonite Pellets. |
| 5 | 5 | 3 | 4-6 | 1.7 | 11.5 | - | ML | | Dark gray-brown (10 YR 4/2) SILT, some Clay, aplastic, weak odor, moist to wet, dense. | | |
| | | | | | | | SP | | SAND, as above but brown (10 YR 5/3) and dry. | SAND | |
| | | | | | | | ML | | Black SILT, as above. | | |
| | | | | | | | SP | | SILT, as above at 5 to 5.5'. | | |
| | | 4 | 6-8 | 1.9 | 98.2 | - | | | SAND, as above at 0.6 to 1.0', but with some Silt, some Clay, and few to trace subangular to subrounded Gravel. | | |
| | | | | | | | ML | | SILT, as above at 5 to 5.5', locally a Silty Clay. | SILT | |
| | | 5 | 8-10 | 2.0 | 87.2 | - | | | Brown (10 YR 5/3) fine subangular SAND, little Clay, some Silt, no odor, dry, moderately dense. | | |
| 10 | 10 | | | | | | | | 10-10.8': Sand as above, but mixed with layers of black silt and sand. | | |
| | | 6 | 10-12 | 2.0 | 24.9 | + | SP | | | SAND | |
| | | 7 | 12-14 | 2.0 | 29.7 | + | | | | | |
| | | | | | | | | | SILT, as above at 5 to 5.5', but wet, moderate odor. | | |
| 15 | 15 | 8 | 14-16 | 2.0 | 83.3 | + | ML | | 14.2-14.5': Lens of dark yellow-brown (10 YR 4/4) Clay (CL), some Silt, plastic, moderately stiff to stiff, moderate odor, wet. 14.6': Increased clay content locally to a silty clay. | SILT | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0-2', 2-4', 8-10' and 10-12' bgs.
+ = Positive Test Result

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/27/01 | 13.3' bgs | |

Project: 64410.011
Data File:RFI-36-26.dat
Template: j:\rockware\logplot2001\logfiles\64410\geoprobe.ldf
Date: 8/10/01

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-26

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 1.8 | 20.7 | + | ML | | SILT, as above at 5 to 5.5', but wet, moderate odor. | SILT | Borehole backfilled with Bentonite Pellets. |
| | | | | | | | SP | | Brown (10 YR 4/3) quartz-rich fine subangular SAND, some Silt, few Clay, moderate to strong odor, moderately dense. | SAND | |
| 20 | 20 | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0-2', 2-4', 8-10' and 10-12' bgs.
+ = Positive Test Result

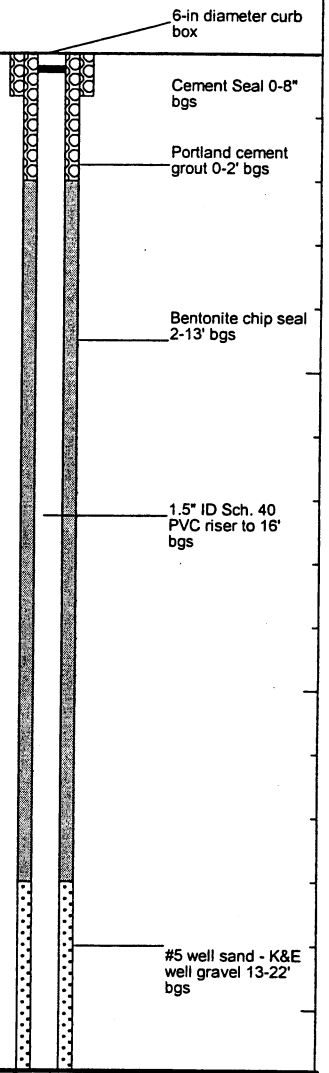
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/27/01 | 13.3' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 3/26/01 - 3/26/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:**<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 568220.29<br>**Easting:** 13306562.62<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 22' bgs<br>**Surface Elevation:** 755.46<br><br>**Descriptions By:** S. Duly | **Boring ID:** RFI-36-27<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 755 | | | | | | FI | | Concrete. | FILL |
| | | 1 | 0-2 | 1.2 | 1.2 | - | SP | | Gray-brown (10 YR 5/2) SAND, some Silt, little Clay, aplastic, no odor, dry to damp, moderately dense. | SILT |
| | | 2 | 2-4 | 0.5 | 2.5 | - | ML | | Light brown-gray (10 YR 6/2) SILT, initially black at upper contact, little Clay, some to little fine to medium Sand, aplastic, no odor, dry, dense. | SILT |
| 5 | 750 | 3 | 4-6 | 2.0 | 9.6 | - | ML | | Brown (10 YR 4/3) SILT, some Clay, little fine to medium subangular Sand, few fine to coarse rounded Gravel, aplastic, no odor, dry, dense. | SILT |
| | | 4 | 6-8 | 2.0 | 5.5 | - | ML | | As above but damp, increased clay locally to a silty clay in patches. | SILT |
| | | 5 | 8-10 | 2.0 | 7.5 | - | CL | | Dark yellow-brown (10 YR 4/4) CLAY, some Silt, little fine to medium subangular Sand, few fine to coarse rounded Gravel, plastic, no odor, dry, soft. | CLAY |
| | | | | | | | SP | | Damp, dark gray (10 YR 4/1) SAND, as above at 0.8 to 1.2'. | SAND |
| 10 | 745 | | | | | | CL | | CLAY, as above at 8.1 to 9.1'. | SAND |
| | | 6 | 10-12 | 2.0 | 38.8 | - | SP | | SAND, as above at 0.8 to 1.2'. | SAND |
| | | 7 | 12-14 | 1.9 | 127 | - | SP | | SAND, as above at 0.8 to 1.2'. | SAND |
| 15 | 740 | 8 | 14-16 | 1.7 | 28 | + | ML | | SILT, as above at 4.3 to 8.1', but damp to moist, color changed to dark gray-brown (10 YR 4/2), and moderate odor. | SILT |
| | | | | | | | SP | | SAND, as above at 0.8 to 1.2'. | SAND |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA=Not Applicable/Not Available;
+ = Positive Test Result.
Samples collected 0-2', 8-10', 12-14' and 14-16' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/26/01 | 17.2 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-27

**Borehole Depth:** 22' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 2.0 | 38.8 | + | SP | | SAND, as above at 0.8 to 1.2'.<br>Becomes darker gray-brown (10 YR 3/2), saturated, moderate odor. | SAND | #5 well sand - K&E well gravel 13-22' bgs |
| | | 10 | 18-20 | 1.8 | 38.3 | + | | | | | 1.5" ID Sch. 40 PVC 0.010" Slot Screen 16-22' bgs |
| 20 | 735 | 11 | 20-22 | 1.0 | 332 | + | | | | | 1.5" ID Sch. 40 PVC bottom cap |
| 25 | 730 | | | | | | | | | | |
| 30 | 725 | | | | | | | | | | |
| 35 | 720 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA=Not Applicable/Not Available;
+ = Positive Test Result.
Samples collected 0-2', 8-10', 12-14' and 14-16' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/26/01 | 17.2 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 3/26/01 - 3/29/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:**<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 568184.49<br>**Easting:** 13306867.00<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 22' bgs<br>**Surface Elevation:** 755.58<br><br>**Descriptions By:** S. Duly | **Boring ID:** RFI-36-28<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 755 | | | | | | FI | Concrete. | FILL |
| | | 1 | 0-2 | 1.0 | 5.2 | - | SP | Yellow-brown (10 YR 5/4) SAND, some Silt, little Clay, aplastic, moderately dense, no odor, damp. | SAND |
| | | 2 | 2-4 | 1.2 | 5.6 | + | | | |
| | | | | | | | ML | Black (10 YR 2/1) SILT, little to some fine to medium subangular Sand, little Clay, few to trace subrounded fine to coarse Gravel, aplastic, moderately dense, weak odor, damp, "greasy". | SILT & CLAY |
| 5 | 750 | 3 | 4-6 | 1.8 | 3.6 | - | ML/CL | Gray (10 YR 4/1) SILTY CLAY, little fine to medium subangular Sand, trace rounded Gravel, plastic, weak to moderate odor, damp, moderately stiff to moderately soft. | |
| | | 4 | 6-8 | 2.0 | 4.3 | - | | | |
| | | 5 | 8-10 | 2.0 | 6.1 | + | SP | SAND, as above at 0.6 to 3.5'. | |
| | | | | | | | ML/CL | SILTY CLAY, as above at 4.7 to 8.4'. | |
| | | | | | | | ML | Yellow-brown (10 YR 5/4) SILT, some fine to medium Sand, little Clay, aplastic, moderately dense, moderate odor, damp. | |
| 10 | 745 | 6 | 10-12 | 1.1 | 8.3 | + | SP | Yellow-brown (10 YR 5/4) fine to medium subangular SAND, some Silt, little to few Clay, moderately dense to moderately loose, weak odor, damp to dry. | SAND |
| | | 7 | 12-14 | 1.3 | 4.3 | + | | | |
| 15 | 740 | 8 | 14-16 | 1.2 | 5.7 | + | | | |

Boring Construction: Borehole backfilled with Bentonite Pellets.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; NA=Not Applicable/Not Available
Samples collected 0-2', 8-10', 10-12' and 14-16' bgs.
+ = Positive Test Result

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/29/01 | 17.6' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-28

**Borehole Depth:** 22' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 1.4 | 45.2 | + | SP | | Yellow-brown (10 YR 5/4) fine to medium subangular SAND, some Silt, little to few Clay, moderately dense to moderately loose, weak odor, damp to dry. | SAND | |
| | | 10 | 18-20 | 2.0 | 4.8 | + | | | | | Borehole backfilled with Bentonite Pellets. |
| 20 | 735 | 11 | 20-22 | 2.0 | 4.8 | + | | | | | |
| 25 | 730 | | | | | | | | | | |
| 30 | 725 | | | | | | | | | | |
| 35 | 720 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; NA=Not Applicable/Not Available
Samples collected 0-2', 8-10', 10-12' and 14-16' bgs.
+ = Positive Test Result

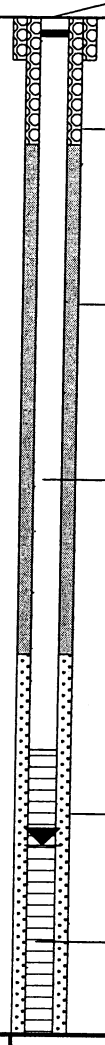
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/29/01 | 17.6' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 3/28/01 - 3/28/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:**<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 567634.3<br>**Easting:** 13306850.93<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16.5' bgs<br>**Surface Elevation:** 753.86<br><br>**Descriptions By:** S. Duly | **Boring ID:** RFI-36-29<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | |
| 0 | | | | | | | | | | |
| | | | | | | | FL | | Concrete. | FILL |
| | | 1 | 0-2 | 1.5 | 89.2 | + | ML | | Yellow-brown (10 YR 5/4) fine to medium subangular SAND, little Clay, some Silt, aplastic, no odor, damp to dry, moderately loose. | SILT |
| | | | | | | | CL | | Black (10 YR 2/1) SILT, little Clay, some fine to medium subangular Sand, aplastic, no odor, dry to damp, moderately dense. Increased clay content last inch to lower contact. | CLAY |
| | | 2 | 2-4 | 2.0 | 230 | + | | | Dark gray-brown (10 YR 4/2) CLAY, some Silt, little fine to medium subangular Sand, trace fine to medium subrounded Gravel, plastic, moderate odor, dry, soft to moderately stiff. | |
| | 750 | | | | | | | | | |
| 5 | | 3 | 4-6 | 2.0 | 165 | + | ML | | SILT, as above at 0.8 to 1.6', but very dark gray-brown (10 YR 3/2), some Clay, weak to moderate odor. | SILT |
| | | 4 | 6-8 | 2.0 | 161 | - | | | Gray-brown (10 YR 5/2) very fine to medium SAND and SILT, little to few Clay, no odor, dry to damp, moderately dense. | SAND & SILT |
| | 745 | 5 | 8-10 | 1.8 | 245 | - | SP/ML | | Brown (10 YR 5/3). | |
| 10 | | 6 | 10-12 | 1.9 | 106 | + | | | Dark gray (10 YR 2/1) fine to medium subangular SAND, some Silt, little to few Clay, dry, moderately loose. | SAND |
| | | 7 | 12-14 | 1.7 | 75.8 | + | SP | | Saturated, weak odor. | |
| | 740 | | | | | | | | | |
| 15 | | 8 | 14-16. | 2.0 | 12.9 | - | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0-2', 8-10' and 10-12' bgs.
+ = Positive Test Result

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/28/01 | 13.0 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-29

**Borehole Depth:** 16.5' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 14-16. | 2.0 | 12.9 | - | SP | | Dark gray (10 YR 2/1) fine to medium subangular SAND, some Silt, little to few Clay, dry, moderately loose. | sand | #5 well sand - K&E well gravel (10.0' - 16.5' bgs); 1.5" ID Sch. 40 PVC 0.010" Slot Screen (11.5' - 16.5' bgs); 1.5" ID Sch. 40 PVC bottom cap |
| | 735 | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| | 730 | | | | | | | | | | |
| 25 | | | | | | | | | | | |
| | 725 | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| | 720 | | | | | | | | | | |
| 35 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0-2', 8-10' and 10-12' bgs.
+ = Positive Test Result

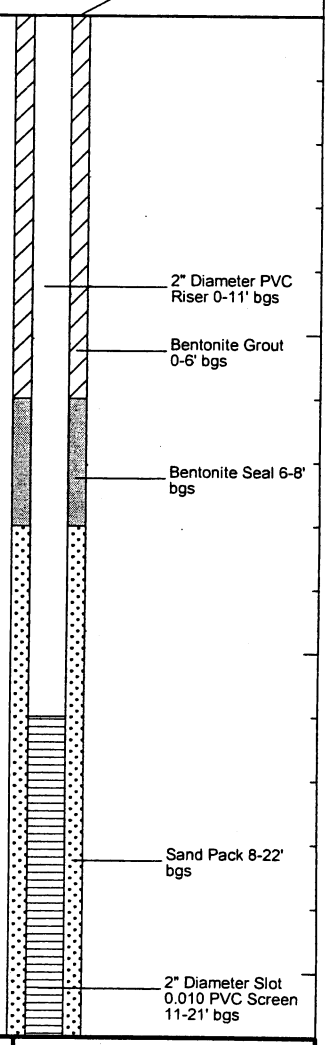
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/28/01 | 13.0 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/15/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rick Rau<br>**Drilling Method:** HSA<br>**Sampler Size:** NA<br>**Auger Size:** 3 1/4" ID HSA<br>**Rig Type:** CME 45 Skid Rig | **Northing:** 567621.36<br>**Easting:** 13306850.62<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 22' bgs<br>**Surface Elevation:** 753.72<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-29R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | Concrete. | FILL |
| | | NA | NA | NA | NA | NA | NA | NA | ML | | Yellow-brown (10 YR 5/4) fine to medium subangular SAND, little Clay, some Silt, aplastic, no odor, damp to dry, moderately loose. | SILT |
| | | NA | NA | NA | NA | NA | NA | NA | CL | | Black (10 YR 2/1) SILT, little Clay, some fine to medium subangular Sand, aplastic, no odor, dry to damp, moderately dense. Increased clay content last inch to lower contact.<br>Dark gray-brown (10 YR 4/2) CLAY, some Silt, little fine to medium subangular Sand, trace fine to medium subrounded Gravel, plastic, moderate odor, dry, soft to moderately stiff. | CLAY |
| 5 | 5 | NA | NA | NA | NA | NA | NA | NA | ML | | SILT, as above at 0.8 to 1.6', but very dark gray-brown (10 YR 3/2), some Clay, weak to moderate odor. | SILT |
| | | NA | NA | NA | NA | NA | NA | NA | SP/ ML | | Gray-brown (10 YR 5/2) very fine to medium SAND and SILT, little to few Clay, no odor, dry to damp, moderately dense. | SAND & SILT |
| | | NA | NA | NA | NA | NA | NA | NA | | | Brown (10 YR 5/3). | |
| 10 | 10 | NA | NA | NA | NA | NA | NA | NA | SP | | Dark gray (10 YR 2/1) fine to medium subangular SAND, some Silt, little to few Clay, dry, moderately loose. | SAND |
| | | NA | NA | NA | NA | NA | NA | NA | | | Saturated, weak odor. | |
| 15 | 15 | NA | NA | NA | NA | NA | NA | NA | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Stratigraphic Description from original log for RFI-36-29.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-29R

**Borehole Depth:** 22' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | SP | | Dark gray (10 YR 2/1) fine to medium subangular SAND, some Silt, little to few Clay, dry, moderately loose. | sand | |
| | | | | | | | | | | | Blind drilled from 16.5 to 22' bgs to set well. No sampling conducted. | | Sand Pack 8-22' bgs |
| | | NA | NA | NA | NA | NA | NA | NA | | | | | 2" Diameter Slot 0.010 PVC Screen 11-21' bgs |
| 20 | 20 | | | | | | | | | | | | |
| | | | | | | | | | | | End of borehole at 22.0'. | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Stratigraphic Description from original log for RFI-36-29.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 3/28/01 - 3/28/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:**<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 567440.66<br>**Easting:** 13306881.86<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 753.51<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-30<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | |
| 0 | | | | | | | FL | | Concrete. | FILL | |
| | | 1 | 0-2 | 1.2 | 215 | - | SP | | Brown (10 YR 5/3) fine to medium subangular SAND, little to some Silt, little Clay, aplastic, no odor, dry to damp, moderately dense to loose. | | |
| | | | | | | | ML | | Black (10 YR 2/1) SILT, little to some fine to medium subangular Sand, little Clay, aplastic, no odor, dry to damp, moderately dense. | SILT | |
| | | | | | | | SP | | SAND, as above at 0.6 to 1.2'. | | |
| | | 2 | 2-4 | 2.0 | 324 | - | CL | | Very dark gray (10 YR 3/1) CLAY, some Silt, little fine to medium subangular Sand, plastic, weak odor, damp, soft to moderately stiff. Local increases of silt to a silty clay. | CLAY | Borehole backfilled with Bentonite Pellets. |
| | 750 | | | | | | | | | | |
| 5 | | 3 | 4-6 | 2.0 | 206 | - | | | | | |
| | | 4 | 6-8 | 1.8 | 970 | - | | | | | |
| | | | | | | | ML | | Brown (10 YR 5/4) SILT, little Clay, little fine to medium subangular Sand, aplastic, moderate odor, dry, dense. | SAND & SILT | |
| | 745 | 5 | 8-10 | 1.8 | 1331 | + | SP/ML | | Yellow-brown (10 YR 5/4) very fine to medium SAND and SILT, little Clay, aplastic, moderate to strong odor, dry to damp, moderately dense. Dark gray-brown (10YR 4/2) 8-9.5' bgs. | | |
| 10 | | 6 | 10-12 | 1.7 | 3351 | - | | | | | |
| | 740 | 7 | 12-14 | 2.0 | 3994 | + | | | Saturated. | | |
| 15 | | 8 | 14-16 | 2.0 | 1282 | - | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available
Hole collapsed at 12.8' - no well installed.
Samples collected 0-2', 8-10' and 10-12' bgs.

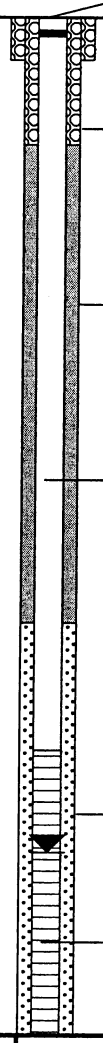
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/28/01 | 12.9' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 3/28/01 - 3/28/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** 66 DT Advance Geoprobe<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:**<br>**Rig Type:** | **Northing:** 567556.16<br>**Easting:** 13306670.89<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16.5' bgs<br>**Surface Elevation:** 753.51<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-31<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | |
| 0 | | | | | | | FL | Concrete. | FILL |
| | | 1 | 0-2 | 0.8 | 5.0 | - | ML | Black SILT, little Clay, some to little fine to medium Sand, dry to moist, moderately dense. | SILT |
| | 750 | 2 | 2-4 | 2.0 | 11.8 | - | | Brown SILT, some Clay, little fine to medium Sand, weak odor, dry, dense. | |
| 5 | | 3 | 4-6 | 2.0 | 6.6 | - | | | |
| | | 4 | 6-8 | 1.3 | 41.6 | - | CL | Dark yellow-brown CLAY, some Silt, little fine to medium Sand, plastic, dry to damp, soft to moderately stiff. | CLAY |
| | 745 | 5 | 8-10 | 1.7 | 223 | + | ML | SILT, as above at 0.6 - 3.1'. | SILT |
| 10 | | 6 | 10-12 | 1.2 | 89.4 | + | SP/ML | Brown very fine to fine SAND and SILT, trace to little Clay, dry, moderately dense. | SAND & SILT |
| | 740 | 7 | 12-14 | 1.5 | 114 | + | | | |
| 15 | | 8 | 14-16. | 1.8 | 165 | - | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0-2', 8-10' and 10-12' bgs.
+ = Positive Test Result

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/28/01 | 13.1 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-31

**Borehole Depth:** 16.5' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 14-16. | 1.8 | 165 | - | SP/ML | | Brown very fine to fine SAND and SILT, trace to little Clay, dry, moderately dense. | | #5 well sand - K&E well gravel 9.5-16.5' bgs; 1.5" ID Sch. 40 PVC 0.010" Slot Screen 11.5-16.5' bgs; 1.5" ID Sch. 40 PVC bottom cap |
| | 735 | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| | 730 | | | | | | | | | | |
| 25 | | | | | | | | | | | |
| | 725 | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| | 720 | | | | | | | | | | |
| 35 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0-2', 8-10' and 10-12' bgs.
+ = Positive Test Result

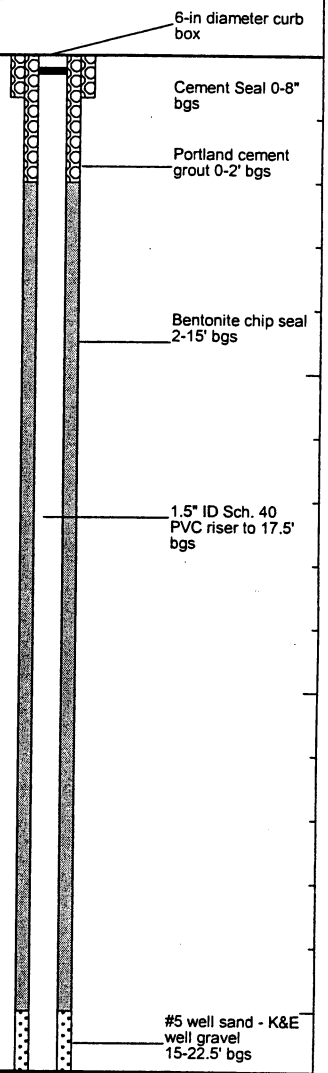
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/28/01 | 13.1 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 3/28/01 - 3/28/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** 66 DT Advance Geoprobe<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:**<br>**Rig Type:** | **Northing:** 568531.05<br>**Easting:** 13306648.95<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 22.5' bgs<br>**Surface Elevation:** 756.28<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-32<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | FL | Concrete. | FILL |
| | | | | | | | SP | Dark yellow-brown fine to medium SAND, some Silt, little Clay, dry to moist, moderately dense. | |
| | 755 | 1 | 0-2 | 1.4 | 23.2 | - | ML | Black SILT, some fine to medium Sand, little Clay, dry, moderately dense to dense. | SILT |
| | | 2 | 2-4 | 1.6 | 7.9 | - | | Yellow-brown SILT, little fine to medium Sand, some Clay, dry, dense. | |
| | | | | | | | | SILT, as above at 0.9 to 2.4'. | |
| 5 | | 3 | 4-6 | 1.8 | 6.4 | - | CL | Brown SILTY CLAY, little to some fine to medium Sand, trace fine to coarse Gravel, plastic, dry, dense. | SILTY CLAY |
| | 750 | 4 | 6-8 | 2.0 | 11.7 | - | | | |
| | | 5 | 8-10 | 2.0 | 10.9 | - | ML | Yellow-brown SILT, little to some Clay, little fine to medium Sand, moist, moderately dense to dense. | SILT |
| 10 | | | | | | | | | |
| | 745 | 6 | 10-12 | 1.4 | 24.7 | - | CL | Brown CLAY, similar to Silty Clay from 4.1 to 7.5' bgs, but no gravel; some to little Silt, trace to little Sand. | |
| | | 7 | 12-14 | 1.4 | 27.3 | - | SP | Dark gray-brown fine to medium SAND, some Silt, little Clay, dry to moist, moderately dense to moderately loose. | SAND |
| 15 | | 8 | 14-16 | 1.4 | 13.6 | - | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0-2', 8-10',12-14' and 16-18' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/28/01 | 18.8 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-32

**Borehole Depth:** 22.5' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | Dark gray-brown fine to medium SAND, some Silt, little Clay, dry to moist, moderately dense to moderately loose. | SAND | |
| | | 9 | 16-18 | 1.5 | 24.7 | - | SP | | | | #5 well sand - K&E well gravel 15-22.5' bgs |
| | | 10 | 18-20. | 2.5 | 15.9 | - | | | | | 1.5" ID Sch. 40 PVC 0.010" Slot Screen 17.5-22.5' bgs |
| 20 | | | | | | | | | | | |
| | 735 | 11 | 20.5-2 | NA | NA | NA | | | | | 1.5" ID Sch. 40 PVC bottom cap |
| 25 | | | | | | | | | | | |
| | 730 | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| | 725 | | | | | | | | | | |
| 35 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0-2', 8-10',12-14' and 16-18' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/28/01 | 18.8 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 3/29/01 - 3/29/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** 66 DT Advance Geoprobe<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:**<br>**Rig Type:** | **Northing:** 568537.9<br>**Easting:** 13306391.96<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** 756.53<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-33<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | FL | | Concrete. | FILL | |
| | 755 | 1 | 0-2 | 1.4 | 4.4 | - | SP | | Yellow-brown fine to medium SAND, little Clay, some Silt, dry to moist, moderately dense. | SAND | |
| | | 2 | 2-4 | 2.0 | 7.3 | - | ML | | Very dark brown SILT, some Clay, little fine to medium Sand, dry, dense. | SILT | Borehole backfilled with Bentonite Pellets. |
| 5 | | 3 | 4-6 | 1.8 | 4.7 | - | ML/CL | | Brown SILT and CLAY, little fine to medium Sand, trace fine to medium Gravel, locally plastic, dry, moderately soft to moderately stiff, dense. | SILT & CLAY | |
| | 750 | 4 | 6-8 | 2.0 | 5.6 | - | | | | | |
| | | 5 | 8-10 | 2.0 | 4.9 | - | | | | | |
| 10 | | 6 | 10-12 | 1.6 | 7.9 | - | ML | | Brown SILT, little to some Clay, little to some fine to medium Sand, dry, moderately dense. | SILT | |
| | 745 | 7 | 12-14 | 1.4 | 10.0 | - | SP/ML | | Light yellow-brown very fine to fine SAND and SILT, little Clay, dry to moist, moderately dense. | SAND & SILT | |
| 15 | | 8 | 14-16 | 1.4 | 12.4 | - | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0-2', 8-10' and 16-18' bgs.
+ = Positive Test Result

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/29/01 | 18.1' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-33

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | 9 | 16-18 | 1.5 | 62.0 | + | SP/ML | | Light yellow-brown very fine to fine SAND and SILT, little Clay, dry to moist, moderately dense. | SAND & SILT | Borehole backfilled with Bentonite Pellets. |
| | | 10 | 18-20 | 2.0 | 13.6 | + | | | | | |
| 20 | | | | | | | | | | | |
| | 735 | | | | | | | | | | |
| 25 | | | | | | | | | | | |
| | 730 | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| | 725 | | | | | | | | | | |
| 35 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0-2', 8-10' and 16-18' bgs.
+ = Positive Test Result

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/29/01 | 18.1' bgs | |

**Date Start/Finish:** 06/28/01
**Drilling Company:** Rau Drilling
**Driller's Name:** Greg Compeau
**Drilling Method:** HSA/SS
**Sampler Size:** 2'x2" ID
**Auger Size:** 3 1/4"
**Rig Type:** CME 55

**Northing:** 567467.53
**Easting:** 13307029
**Casing Elevation:** NA

**Borehole Depth:** 15' bgs
**Surface Elevation:** 750.26

**Descriptions By:** SC Kerr

**Boring ID:** RFI-36-34

**Client:** General Motors

**Location:** GM Flint
Flint, Michigan

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | 1 | 0-2 | 3 2 3 2 | 5 | 1.3 | >9999 | + | FL | | Concrete. | FILL | |
| | | | | | | | | | SP | | Yellow brown 10 YR 5/6 fine to medium SAND, some Silt, moist, loose, no odor. | SAND | |
| | | 2 | 2-4 | 2 4 4 2 | 8 | 1.3 | N/A | + | CL | | Yellow brown 10 YR 5/4 Silty CLAY, few fine to medium Sand, stiff, pp=4.0, low plastic, damp, no odor, soften at 3.9' bgs and more plastic. | CLAY and SILT | |
| 5 | 745 | 3 | 4-6 | 3 4 4 4 | 8 | 1.5 | 888 | + | ML | | Yellow brown 10 YR 5/6 aplastic SILT, little fine Sand, little Clay, moist, moderately dense, no odor. | | |
| | | 4 | 6-8 | 1 4 6 6 | 10 | 1.3 | 69.7 | + | SP | | Gray 10 YR 5/1 fine SAND, some Silt, clay seams 0.5" to 2", little balck staining, moist to wet, hydrocarbon (?) odor, becomes no staining at 8.6' bgs. | SAND | |
| | | 5 | 8-10 | 6 10 8 8 | 18 | 1.5 | 128 | - | | | | | |
| 10 | 740 | 6 | 10-12 | 1 2 3 4 | 5 | 1.4 | 26.4 | - | ML | | Yellow brown 10 YR 5/4 aplastic SILT, little fine Sand, saturated, moderately dense, no odor, color changes to gray 10 YR 5/1 at 11.8' bgs. | CLAY and SILT | |
| | | 7 | 12-14 | 1 3 6 7 | 9 | 1.7 | 0 | + | | | | | |
| | | | | | | | | | CL | | Gray 10 YR 5/1 CLAY, mottling, highly plastic, pp=1.5, no odor. | | |
| | | 8 | 14-15 | | | | | | SP | | Yellow brown 10 YR 5/4 fine to coarse subangular SAND (predominantly medium), saturated, loose, no odor, gray clay in tip at 18.0' bgs, pp>2.0. | SAND | |
| 15 | 735 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available; PID Background:0.0 ppm
+ = Positive Test Result
Samples collected 0.9-2.9' and 6.9-8.9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/28/01 | 9.5 | |

Project: 64410.022 Template: j:\rockware\logplot2001\logfiles\64410\auger_well2.ldf
Data File:j:\rockware\logplot2001\logfiles\64410\RFI-36-34.dat Date: 07/13/01

| | | |
|---|---|---|
| **Date Start/Finish:** 3/27/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** NA<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 45 Truck-mount | **Northing:** 567564.86<br>**Easting:** 13307039.45<br>**Casing Elevation:** 750.05<br><br>**Borehole Depth:** 26' bgs<br>**Surface Elevation:** 750.05<br><br>**Descriptions By:** B. Loomis | **Boring ID:** RFI-36-35<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | | | | | | | | | | |
| | | 1 | 0-2 | NA<br>2<br>3<br>3 | 5 | 1.0 | 5.4 | - | FILL | CONCRETE. | FILL |
| | | | | | | | | | SP | Brown medium SAND. | alternating sand and clay |
| | | | | | | | | | CL | Dark brown-black SANDY CLAY. | |
| | | | | | | | | | SP | Brown medium SAND. | |
| | | 2 | 2-4 | 3<br>3<br>4<br>4 | 7 | 1.8 | 2.0 | - | SP | Dark gray-brown SANDY CLAY. | |
| | | | | | | | | | CL | Brown medium SAND. | |
| | | | | | | | | | SP | Brown soft, plastic CLAY with brown and black medium Sand. | |
| | | | | | | | | | CL | Brown and black medium SAND. | |
| | | 3 | 4-6 | 3<br>3<br>5<br>4 | 8 | 2.0 | 6.5 | - | SP | Brown medium SAND. | |
| | | | | | | | | | CL | Brown highly plastic CLAY. | |
| 5 | 745 | | | | | | | | | Brown fine to medium SAND. | |
| | | | | | | | | | | Dark brown SANDY CLAY, trace Silt. | |
| | | | | | | | | | SP | Brown SANDY CLAY, trace Silt, rounded Gravel @ 5.0' bgs. | |
| | | 4 | 6-8 | 2<br>2<br>2<br>3 | 4 | 2.0 | 7.7 | - | | Dark brown SANDY CLAY. | |
| | | | | | | | | | CL | Brown fine to medium SAND. | |
| | | | | | | | | | | Dark brown and black SANDY CLAY with Silt. | |
| | | 5 | 8-10 | 2<br>3<br>5<br>6 | 8 | 2.0 | 3.0 | - | SP | Brown fine to medium SAND. | SAND |
| 10 | 740 | | | | | | | | | | |
| | | 6 | 10-12 | 5<br>6<br>4<br>10 | 10 | 1.5 | 3.3 | - | | Light brown-gray fine to medium SAND.<br>Brown/light brown fine to medium SAND. | |
| | | 7 | 12-14 | 7<br>8<br>7<br>7 | 15 | 1.5 | 8.5 | - | | Moist to wet. | |
| | | 8 | 14-16 | 3<br>3<br>4<br>3 | 7 | 1.5 | 7.0 | - | | Saturated. | |
| 15 | 735 | | | | | | | | | | |

**Boring Construction**

- 8" diameter steel flushmount with cement pad 0-1' bgs.
- Bentonite seal 2-12' bgs.
- 2" ID Sch. 40 PVC riser to 15' bgs.
- Sand pack 12 to 26' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 15-25' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0-2' 8-10' and 12-14' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/27/01 | 14.0' | |

**Client:**
General Motors

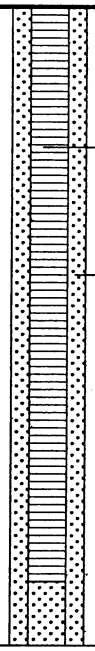
**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-35

**Borehole Depth:** 26' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 3 3 5 4 | 8 | 1.2 | 1.0 | - | SP | | Brown/light brown fine to medium SAND, saturated. | SAND |
| | | 10 | 18-20 | 2 3 5 6 | 8 | 1.3 | 0.0 | - | | | | |
| 20 | 730 | 11 | 20-22 | 2 3 5 5 | 8 | 2.0 | NA | NA | | | | |
| | | 12 | 22-24 | 3 4 4 5 | 8 | 2.0 | NA | NA | SP/SM | | Gray-brown very fine SAND with Silt. | sand with silt |
| 25 | 725 | 13 | 24-26 | 4 4 3 4 | 7 | 1.8 | 0.0 | - | CL/ML | | Gray firm plastic CLAY and SILT. Glacial clay till. | clay and silt |
| 30 | 720 | | | | | | | | | | | |
| 35 | 715 | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0-2' 8-10' and 12-14' bgs.

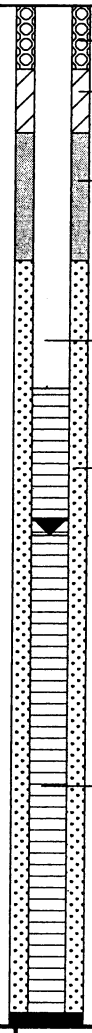
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 3/27/01 | 14.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/29/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 567713.93<br>**Easting:** 13307072.25<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 750.19<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-36<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | 1 | 0-2 | 5 4 6 7 | 10 | 1.6 | >10,000 | + | FL | | CONCRETE. | FILL |
| | | | | | | | | | SM | | Yellow-brown (10YR 5/4) Silty SAND, fine to medium subrounded to subangular Sand, aplastic, moderate dense to moderate loose, Fill. | |
| | | 2 | 2-4 | 5 4 3 3 | 7 | 1.8 | >10,000 | + | CL | | Black (10YR 2/1) Silty CLAY, little fine to medium subangular Sand, trace subrounded fine to medium Gravel, moderately stiff to stiff, no odor, dry to damp. | |
| | | | | | | | | | SP | | White (10YR 1/1) semi-lithified SAND, fine to coarse angular Sand-sized fragments of unknown Fill material, no odor, dense, dry. | |
| | | | | | | | | | ML | | Black (10YR 2/1) SILT, little fine to medium subangular to subrounded Sand, few Clay, aplastic, no odor, damp, dense, old Roots present, also former topsoil horizon. | SILT |
| 5 | 745 | 3 | 4-6 | 3 3 2 3 | 5 | 1.5 | >10,000 | + | CL | | Gray (10YR 5/1) CLAY, some Silt with local lenses of Silt up to 1" wide throughout, little fine to medium subangular to subrounded Sand, trace fine to medium subrounded Gravel, no odor, damp, moderately stiff, extensively oxidized to dark yellow-brown (10YR 2/4) throughout. at 6.0': soft. | CLAY |
| | | 4 | 6-8 | 1 4 6 7 | 10 | 2.0 | >10,000 | + | ML | | Yellow-brown (10YR 5/4) SILT, some fine subangular Sand, aplastic, no odor, damp to moist, moderately dense to dense. | SILT |
| | | 5 | 8-10 | 4 7 9 11 | 16 | 1.7 | 324 | - | SP | | Yellow-brown (10YR 5/6) subangular fine to medium SAND, some Silt, no odor, moist to wet, moderately dense to dense. at 8.3': saturated. | SAND |
| 10 | 740 | 6 | 10-12 | 5 5 7 8 | 12 | 2.0 | 4,061 | - | ML | | Gray-brown (10YR 5/2) SILT, little fine subangular Sand, few Clay, no odor, aplastic, dense, saturated. Glacial-alluvial.<br>Becomes gray (10YR 5/1), decreased Sand to few to trace. | SILT |
| | | 7 | 12-14 | 7 4 6 6 | 10 | NA | 830 | - | CL | | Homogeneous gray (10YR 5/1) Silty CLAY, little fine to medium subrounded Sand, no odor, very stiff, moist to damp. Clay Till.<br>at 13': Intermittant silt lenses up to 1" wide throughout. | SILTY CLAY |
| 15 | 735 | 8 | 14-16 | NA | NA | NA | NA | NA | SP | | Gray (10YR 6/1) subangular fine to medium SAND, some to little Silt, aplastic, no odor, wet (saturated), dense. Alluvial/riverine deposit. | SAND |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Background PID = 0.0 ppm; + = Positive Test Result.
Samples collected 1-3' and 5-7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/29/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 567570.92<br>**Easting:** 13307040.51<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 3' bgs<br>**Surface Elevation:** 750.46<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-36R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | | NA | NA | NA | NA | NA | NA | FL | | CONCRETE. | FILL | |
| | | 1 | 1-3 | 7<br>10<br>9<br>7 | 19 | 1.3 | NA | NA | SM | | Yellow-brown (10YR 5/4) Silty SAND, fine poorly graded subangular Sand, few Clay, no odor, dense, aplastic, dry. Fill. | Silty SAND | Borehole backfilled with bentonite (0-3' bgs). |
| | | | | | | | | | FL | | Black (10YR 2/1) silt- to sand-sized angular fragments of ASH/CINDERS/SLAG, no odor, dense, aplastic, dry. Fill. | SILT | |
| 5 | 745 | | | | | | | | | | | | |
| 10 | 740 | | | | | | | | | | | | |
| 15 | 735 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Sample collected 1-3' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/04/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID HSA<br>**Rig Type:** CME 55 | **Northing:** 567755.54<br>**Easting:** 13307195.18<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 24' bgs<br>**Surface Elevation:** 757.15<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-37<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 760 | | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 2 4 7 8 | 11 | 1.6 | 12.4 | - | | | Gray-brown (10 YR 5/2) SILT, little fine to coarse subrounded to subangular Sand, little Clay, organic matter such as roots and vegetation present, no odor, moderately dense to loose, aplastic, dry. Topsoil<br>SILT as above, but brown, trace fine to coarse rounded Gravel, dense, weathered and oxidized. Glacial till. | SILT | |
| | 755 | 2 | 2-4 | 9 11 12 14 | 23 | 1.0 | 14.5 | - | ML | | | | |
| 5 | | 3 | 4-6 | 8 10 12 12 | 22 | 2.0 | 19.2 | - | | | Color change to yellow-brown (10 YR 5/6). | | |
| | 750 | 4 | 6-8 | 3 3 4 3 | 7 | 2.0 | 24.7 | - | | | Yellow-brown (10 YR 6/4) fine to medium subangular poorly graded SAND, some to little Silt, few Clay, no odor, moderately dense, aplastic, damp. Glacial-alluvial. | SAND | |
| | | 5 | 8-10 | 2 3 3 5 | 6 | 1.4 | 0.0 | - | | | Occasional Silt lenses up to 1-2" thick throughout. | | |
| 10 | | 6 | 10-12 | 2 3 4 6 | 7 | 1.5 | 0.0 | - | SP | | | | Borehole tremie grouted. |
| | 745 | 7 | 12-14 | 5 8 8 9 | 16 | 1.7 | 6.5 | - | | | Increased moisture to moist, decreased silt to few to little. | | |
| 15 | | 8 | 14-16 | 3 3 4 4 | 7 | 1.3 | 0.0 | - | | | Trace Clay, moist to wet. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0-2', 6-8' 8-10' and 14-16' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 09/04/01 | 16.0' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-37

**Borehole Depth:** 24' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | 9 | 16-18 | 1 2 5 6 | 7 | 1.2 | 0.0 | - | SP | | Yellow-brown (10 YR 6/4) fine to medium poorly graded subangular SAND, some to little Silt, few Clay, no odor, moderately dense, aplastic, saturated. Glacial-alluvial. | SAND | |
| | | 10 | 18-20 | 3 4 6 11 | 10 | 1.4 | 0.0 | - | | | | | |
| 20 | | 11 | 20-22 | 3 5 5 7 | 10 | 1.4 | 0.0 | - | | | Becomes gray (10 YR 5/1), little to some Silt, fining downwards. | | Borehole tremie grouted. |
| | 735 | 12 | 22-24 | 4 3 5 6 | 8 | 1.7 | 0.0 | - | ML | | Gray (10 YR 5/1) SILT, some Clay, few fine subangular Sand, no odor, moderately dense, aplastic, saturated. Glacial-alluvial. | SILT | |
| 25 | | | | | | | | | | | | | |
| | 730 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0-2', 6-8' 8-10' and 14-16' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 09/04/01 | 16.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/16/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Chaperon<br>**Drilling Method:** Direct Push<br>**Sampler Size:** Macro 4' x 2" OD<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 567711.49<br>**Easting:** 13306674.10<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 754.26<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-38<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | FL | | CONCRETE. | FILL | |
| | | 1 | 0-4 | 3.5 | 0.0 | - | SM | | Yellow-brown (10YR 5/4) Silty SAND, fine to medium poorly graded subangular Sand, few Clay, no odor, dense, aplastic, dry. Fill Sand. | SILTY SAND | |
| | | | | | 0.0 | - | | | Black (10YR 2/1) fine to coarse subangular to angular well-graded Silty SAND, few Clay, debris and glassy fragments present, no odor, dense, aplastic, dry. Foundry Sand | | |
| | | | | | | | | | 4.2-4.5 CONCRETE debris. | | |
| 5 | 5 | 2 | 4-8 | 4.0 | 0.0 | - | CL | | Yellow-brown (10YR 5/4) Silty Lean CLAY, few fine to coarse subangular to subrounded Sand, trace fine to medium subrounded Gravel, stiff, weakly plastic, dry, occasional patches and lenses of increased Silt up to 2" thick. | SILTY CLAY | |
| | | | | | 0.0 | - | | | | | |
| | | 3 | 8-10 | NA | 0.0 | - | SM | | Yellow-brown (10YR 5/4) Silty SAND, fine to medium poorly graded subangular Sand, few Clay, no odor, dense, aplastic, dry. Fill/Foundry Sand. | SILTY SAND | Borehold backfilled with sand and cement to ground surface. |
| 10 | 10 | | | | | | | | Light yellow-brown (10YR 6/4) fine to medium poorly graded subangular Silty SAND, few Clay, no odor, dense, aplastic, dry. Glacial alluvial. | | |
| | | 4 | 10-12 | NA | 0.0 | - | | | Becomes damp. | | |
| | | 5 | 12-14 | NA | 0.0 | - | | | Becomes moist. | | |
| 15 | 15 | 6 | 14-16 | NA | 0.0 | - | | | Saturated, becomes gray (10YR 5/1). | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.5-2.5', 8.5-10.5' and 10.5-12.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 12/16/01 | 14.0' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/16/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Chaperon<br>**Drilling Method:** Direct Push<br>**Sampler Size:** Macro 4' x 2" OD Acetate Sleeve<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 567644.21<br>**Easting:** 13306660.64<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 754.03<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-39<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | FL | | CONCRETE. | FILL | |
| | | | | | 0.0 | - | SM | | Yellow-brown (10YR 5/4) fine to medium poorly graded subangular Silty SAND, few Clay, no odor, dense, aplastic, dry. Fill Sand. | | |
| | | 1 | 0-4 | 3.5 | | | SW | | Black (10YR 2/1) fine to coarse angular to subangular well-graded SAND, some Silt, few Clay, no odor, dense, aplastic, dry. Foundry Sand. | SAND | |
| | | | | | 0.0 | - | | | | | |
| 5 | 5 | | | | 0.0 | - | CL | | Light yellow-brown (10YR 6/4) Silty Lean CLAY, few fine to coarse grained subangular to subrounded Sand, trace fine to medium rounded Gravel, no odor, stiff, weakly plastic, dry.<br><br>4.5': Local patches of oxidation. | SILTY CLAY | |
| | | 2 | 4-8 | NA | | | | | | | |
| | | | | | 0.0 | - | FL | | CEMENT Debris. | FILL | |
| | | | | | | | SW | | Black (10YR 2/1) fine to coarse angular to subangular well-graded SAND (SW), some Silt, few Clay, no odor, dense, aplastic, dry. Foundry Sand. | SAND | Borehold backfilled with sand and cement to ground surface (0-16' bgs). |
| | | | | | 0.0 | - | SM | | Yellow-brown (10YR 5/4) fine to medium poorly graded predominantly fine subangular Silty SAND, few Clay, no odor, dense, aplastic, dry. Glacial alluvial. | SILTY SAND | |
| 10 | 10 | 3 | 8-12 | 4.0 | | | | | | | |
| | | | | | 0.0 | - | | | Damp. | | |
| | | | | | | | | | Moist. | | |
| | | | | | 0.0 | - | | | | | |
| | | 4 | 12-16 | 3.7 | | | | | Saturated. | | |
| 15 | 15 | | | | 0.0 | - | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.5-2.5', 8.5-10.5' and 10.5-12.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 12/16/01 | 14.0' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/16/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Chaperon<br>**Drilling Method:** Direct Push<br>**Sampler Size:** Macro 4' x 2" OD Acetate Sleeve<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 567579.52<br>**Easting:** 13306740.58<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 753.92<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-40<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | FL | | CONCRETE. | FILL | |
| | | | | | 0.0 | - | SM | | Dark yellow-brown (10YR 4/6) fine to medium poorly graded subangular Silty SAND, little Clay, no odor, dense, aplastic, dry. Fill Sand. | SILTY SAND | |
| | | 1 | 0-4 | 2.5 | | | | | | | |
| | | | | | 0.0 | - | SW | | Black (10YR 2/1) fine to coarse subangular well graded SAND, some Silt, trace Clay, no odor, dense, aplastic, damp to moist. Foundry Sand. | SAND | |
| 5 | 5 | | | | 0.0 | - | | | Light yellow-brown (10YR 6/4) Silty Lean CLAY, few fine to coarse subangular to subrounded Sand, trace fine to medium subrounded Gravel, no odor, stiff, weakly plastic, dry. | SILTY CLAY | |
| | | 2 | 4-8 | 4.0 | | | CL | | Becomes Gray (10YR 5/1). | | |
| | | | | | 0.0 | - | | | | | |
| | | | | | 0.0 | - | SM | | Pale brown (10YR 6/3) fine to medium subangular poorly graded Silty SAND, few Clay, no odor, dense, aplastic, damp. | SILTY SAND | Borehold backfilled with sand and cement to ground surface. |
| 10 | 10 | 3 | 8-12 | NA | | | | | Cement debris. | | |
| | | | | | | | | | Becoming increasingly gray. Moist. | | |
| | | | | | 0.0 | - | | | 11.1-11.5: Varved. | | |
| | | | | | 0.0 | - | | | | | |
| | | 4 | 12-16 | NA | | | | | | | |
| 15 | 15 | | | | 0.0 | - | | | Saturated. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.5-2.5', 8.5-10.5' and 12.5-14.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 12/16/01 | 15.2' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/29/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 567617.88<br>**Easting:** 13307049.37<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 3' bgs<br>**Surface Elevation:** 750.56<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-41<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | | NA | NA | NA | NA | NA | NA | FL | | CONCRETE. | FILL | |
| | | | | | | | | | SM | | Yellow-brown (10YR 5/4) Silty SAND, fine poorly graded subangular Sand, few Clay, no odor, moderately dense, aplastic, dry. Fill. | | |
| | | 1 | 1-3 | 7<br>7<br>9<br>11 | 16 | 1.3 | NA | NA | CL | | Gray (10YR 5/1) lean Silty CLAY, little fine to medium subangular Sand, few fine rounded to subrounded Gravel, no odor, stiff, weakly plastic, dry. | SILTY CLAY | Borehole backfilled with bentonite to grade. |
| 5 | 745 | | | | | | | | | | | | |
| 10 | 740 | | | | | | | | | | | | |
| 15 | 735 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Sample collected 1-3' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/29/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 567569.09<br>**Easting:** 13307008.78<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 3' bgs<br>**Surface Elevation:** 749.99<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-42<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | 1 | 0-2 | 6<br>60/<br>1" | NA | 0.2 | NA | NA | FL | | CONCRETE. | FILL | Borehole backfilled with bentonite to grade. |
| | | | | | | | | | SM | | Yellow-brown (10YR 5/4) fine poorly graded Silty SAND, few Clay, no odor, moderately dense, dry. Fill. | TY SA | |
| | | | NA | NA | NA | NA | NA | NA | FL | | CONCRETE (refusal -- spoon). | FILL | |
| 5 | 745 | | | | | | | | | | | | |
| 10 | 740 | | | | | | | | | | | | |
| 15 | 735 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Sample collected 0.1-1.5' bgs.

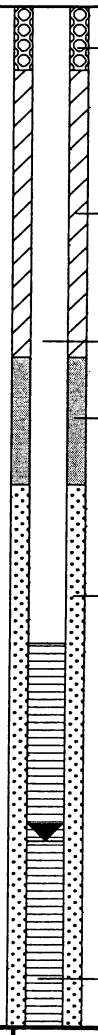
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/15/01<br>**Drilling Company:** RAU Drilling<br>**Driller's Name:** Rick Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4"; 8" hole<br>**Rig Type:** CME 45 Skid Rig | **Northing:** 567440.01<br>**Easting:** 13306888.25<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 21' bgs<br>**Surface Elevation:** 753.26<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-43<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | CONCRETE- pre-cored. | FILL |
| | | 1 | 0.9-2.9 | 5 10 24 15 | 34 | 1.2 | 0.0 | NA | SP | | Dark yellow-brown (10YR 4/4) fine to medium subangular SAND, poorly graded, predominantly medium, little Silt, trace Clay, no odor, very dense, aplastic, damp becoming drier and less dense by 2.8' bgs. Fill Sand. | SAND |
| | | 2 | 2.9-4.9 | 21 34 39 38 | 73 | 1.5 | 0.0 | NA | | | | |
| 5 | 5 | | | | | | | | SW | | Black (10YR 2/1) well graded fine to coarse subangular SAND, some to little Silt, few fine to medium subrounded Gravel, few Clay, no odor, moderately dense, dry, Fill Sand and Gravel. | |
| | | 3 | 4.9-6.9 | 8 9 11 14 | 20 | 1.6 | 0.0 | NA | FL | | CEMENT debris. | SILTY CLAY |
| | | | | | | | | | CL | | Yellow-brown (10YR 5/4) Silty Lean CLAY, little fine to coarse subangular to subrounded Sand, few fine to medium subrounded Gravel, no odor, stiff, moderately plastic, damp. | |
| | | 4 | 6.9-8.9 | 7 10 10 11 | 20 | 1.4 | 0.0 | - | SM | | Yellow-brown (10YR 5/8) fine poorly graded subangular Silty SAND, little to few Clay, no odor, dense, aplastic, dry. | SILTY SAND |
| 10 | 10 | 5 | 8.9-10 | 6 8 8 9 | 16 | 1.4 | 0.0 | - | | | Becomes Gray (10YR 5/2), decreasing moisture content. | |
| | | 6 | 10.9-12 | 6 6 7 7 | 13 | 1.4 | 0.0 | - | | | Glacial alluvial. | |
| | | | | | | | | | | | Gray (10YR 5/1), moderate odor, moist to wet. | |
| | | 7 | 12.9-14 | 6 11 16 16 | 27 | NA | 0.0 | - | | | Weak odor (dissipates in air), saturated. | |
| 15 | 15 | | NA | NA | NA | NA | NA | NA | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0.9-2.9', 6.9-8.9' and 10.9-12.9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-43

**Borehole Depth:** 21' bgs

| DEPTH / ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 20 | | NA | NA | NA | NA | NA | NA | SM | | Yellow-brown (10YR 5/8) fine poorly graded subangular Silty SAND, little to few Clay, no odor, dense, aplastic, dry. Glacial alluvial. | SILTY SAND | Sand Pack 7.5-21' bgs; 0.010 Slot PVC Screen 10-20' bgs |
| 25 25 | | | | | | | | | | | | |
| 30 30 | | | | | | | | | | | | |
| 35 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0.9-2.9', 6.9-8.9' and 10.9-12.9' bgs.

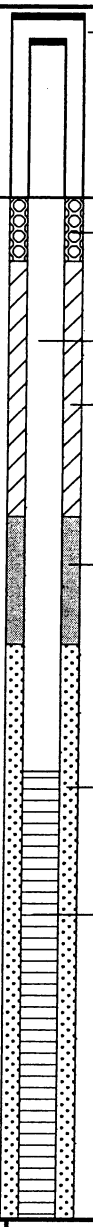
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/25/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4-1/4" ID HSA<br>**Rig Type:** CME 55 ATV | **Northing:** 568048.47<br>**Easting:** 13307267.54<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 752.45<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-44<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-2 | 5 5 5 5 | 10 | 1.5 | 0.0 | - | GP | | Coarse angular poorly-graded GRAVEL, aggregate. | GRAVEL |
| | | | | | | | | | ML | | Very dark brown (10YR 2/2) SILT, some Clay, few fine to medium subangular to subrounded Sand, old roots present, aplastic, no odor, dense, former topsoil horizon. | SILT |
| | | 2 | 2-4 | 2 3 3 3 | 6 | 1.5 | 0.0 | - | | | Yellow-brown (10YR 5/4) SILT, some Clay, few fine to medium subrounded to subangular Sand, aplstic, no odor, dense, damp. | SILT |
| 5 | 5 | 3 | 4-6 | 3 3 3 3 | 6 | 1.3 | 0.0 | - | SP | | Yellow-brown (10YR 5/4) poorly graded fine to medium SAND, some Silt, few Clay, no odor, aplastic, dry, dense, occasional lines of Silt up to 2" wide throughout. | SAND |
| | | 4 | 6-8 | 4 4 4 3 | 8 | 1.6 | 0.0 | - | | | Damp.<br>Moist. | |
| | | 5 | 8-10 | 2 2 3 2 | 5 | 1.6 | 0.0 | - | | | Wet to moist. | |
| 10 | 10 | 6 | 10-12 | 2 3 4 5 | 7 | 1.8 | 0.0 | - | | | Saturated, increased coarsens with increased amount of medium Sand, trace Clay, little Silt. | |
| | | 7 | 12-14 | 3 3 4 4 | 7 | 1.4 | 0.0 | - | | | | |
| 15 | 15 | 8 | 14-16 | 2 5 5 6 | 10 | 1.6 | 0.0 | - | | | Increased in gray tones. | |

**Boring Construction**



- 4" Steel Protective Casing
- Portland Cement 0-1' bgs
- 2-inch PVC Riser 3' ags-9' bgs
- Grout 1-5' bgs
- Bentonite Seal 5-7' bgs
- Global Filter Sand 7-19' bgs
- 2-inch 0.010" Machine-Slotted PVC Screen 9-19' bgs

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3', 7-9' and 9-11' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/24/02 | 11.5' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-44

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 3<br>3<br>2<br>2 | 5 | 1.8 | 0.0 | - | SP | | Yellow-brown (10YR 5/4) poorly graded fine to medium SAND, some Silt, few Clay, no odor, aplastic, dry, dense, occasional lines of Silt up to 2" wide throughout.<br>Increased oxidation, dark yellow-brown (10YR 4/6).<br>Gray (10YR 6/1), fining downwards. | SAND | Global Filter Sand 7-19' bgs<br>2-inch 0.010" Machine-Slotted PVC Screen 9-19' bgs |
| | | | | | | | | | ML | | Gray (10YR 6/1) SILT, little fine subangular to subrounded Sand, decreasing Sand content with depth, few Clay, no odor, saturated, aplastic, moderately dense. | SILT | PVC Cap |
| 20 | 20 | | | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3', 7-9' and 9-11' bgs.

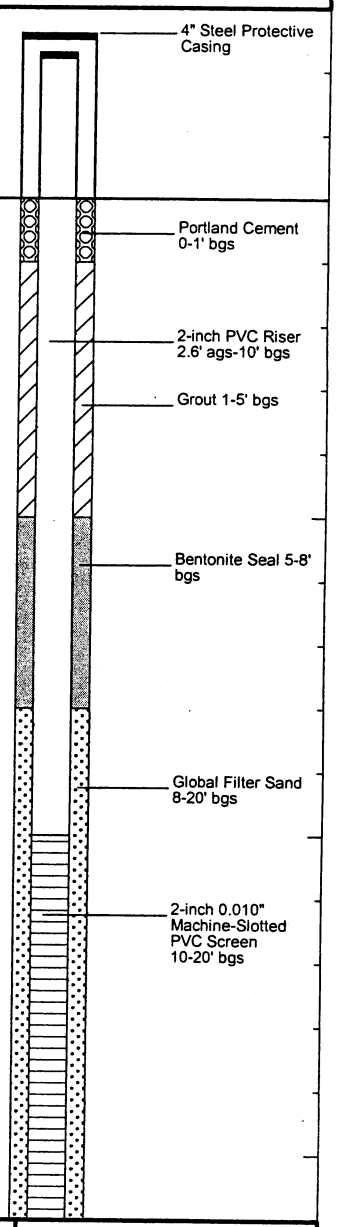
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/24/02 | 11.5' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/24/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4-1/4" ID<br>**Rig Type:** CME 55 ATV | **Northing:** 568336.98<br>**Easting:** 13307301.33<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** 752.83<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-45<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 2 2 2 2 | 4 | 1.4 | 0.0 | - | CH | | Dark brown (10YR 2/2) Fat Silty CLAY, little to few fine to medium subangular to subrounded Sand, trace coarse angular Gravel, no odor, moist, very plastic, soft, Organic matter such as Roots present. Topsoil.<br>Dark yellow-brown (10YR 4/4) Fat Silty CLAY as above. | SILTY CLAY |
| | 750 | 2 | 2-4 | 2 3 3 3 | 6 | 0.8 | 0.0 | - | | | Dark brown (10YR 2/2) Fat Silty CLAY, as above from 0 - 1.1' bgs, old Root structures present, old Topsoil.<br>Becomes lighter in color. | |
| 5 | | 3 | 4-6 | 3 6 7 8 | 13 | 0.7 | 0.0 | - | SM | | Yellow-brown (10YR 5/6) poorly graded fine to medium subangular to subrounded Silty SAND, little Clay, trace coarse subrounded to rounded Gravel, no odor, dense, damp. | SILTY SAND |
| | | 4 | 6-8 | 3 3 4 4 | 7 | 1.5 | 0.0 | - | | | Increased coarseness with more medium grained sands, decreased Clay to few.<br>Moist, decreased density. | |
| | 745 | 5 | 8-10 | 2 2 2 2 | 4 | 1.1 | 0.0 | - | | | Wet to moist. | |
| 10 | | 6 | 10-12 | 2 2 2 1 | 4 | 1.2 | 0.0 | - | | | | |
| | 740 | 7 | 12-14 | 1 1 1 1 | 2 | 1.7 | 0.0 | - | | | Saturated. | |
| 15 | | 8 | 14-16 | 1 1 1 2 | 2 | 1.2 | 0.0 | - | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2', 8-10' and 10-12' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/24/02 | 13.6' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-45

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | 9 | 16-18 | 1<br>1<br>1<br>1 | 2 | 1.3 | 0.0 | - | SM | | Yellow-brown (10YR 5/6) poorly graded fine to medium subangular to subrounded Silty SAND, little Clay, trace coarse subrounded to rounded Gravel, no odor, dense, damp. | SILTY SAND | Global Filter Sand 8-20' bgs<br>2-inch 0.010" Machine-Slotted PVC Screen 10-20' bgs |
| 20 | | 10 | 18-20 | 1<br>2<br>3<br>3 | 5 | 2.0 | 0.0 | - | | | Gray (10YR 6/1), fining downwards, decreased medium Sand content. | | PVC Cap |
| | 730 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2', 8-10' and 10-12' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/24/02 | 13.6' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/10/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Alan Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4"<br>**Rig Type:** CME 75 | **Northing:** 568470.07<br>**Easting:** 13307128.61<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** 750.13<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-36-46<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | | | | | | | | Fill | | Coarse gravel- to pebble-sized angular Aggregate. | | Cement pad. |
| | | 1 | 0-2 | 2 3 5 6 | 8 | 1.8 | NA | - | SW | | Brown (10 YR 5/3) to dark yellow-brown (10 YR 4/4) well-graded fine to coarse subangular SAND, little Silt, few Clay, few fine to coarse angular Gravel (aggregate), aplastic, no odor, damp, dense. | SAND | |
| | | 2 | 2-4 | 4 4 5 6 | 9 | 1.8 | NA | - | CL | | Gray-brown (10 YR 5/2) CLAY, some Silt, little fine to coarse subrounded Sand, trace fine to medium rounded to subrounded Gravel, weakly to moderately plastic, no odor, damp, moderately stiff. Native Glacial clay till used as backfill. | CLAY | |
| 5 | 745 | 3 | 4-6 | 5 5 4 5 | 9 | 0.0 | NA | - | | | No recovery 4-6' bgs, stone in shoe. | | Grout 1-6' bgs. |
| | | 4 | 6-8 | 3 6 6 15 | 12 | 1.5 | NA | - | | | | | Bentonite seal 6-8' bgs. |
| | | 5 | 8-10 | 6 7 7 8 | 14 | 2.0 | NA | - | SP | | Brown (10 YR 5/3) to yellow-brown (10 YR 5/4) poorly graded fine to medium subrounded to subangular SAND, some to little Silt, few clay, aplastic, no odor, damp, dense.<br>at 8.3': Fine to medium SAND, increased silt content with depth, better sorted. | SAND | 2" ID Sch. 40 PVC riser 0.3-10' bgs.<br>#5 Global filter sandpack 8-20' bgs. |
| 10 | 740 | 6 | 10-12 | 4 4 5 6 | 9 | 1.8 | NA | - | | | Moist. | | |
| | | 7 | 12-14 | 2 2 3 3 | 5 | 1.6 | NA | - | | | Saturated, decreased density with depth, little Silt. Glacial-alluvial. | | 2" ID Sch. 40 PVC 0.010" slotted screen 10-20' bgs. |
| 15 | 735 | 8 | 14-16 | 1 1 1 3 | 2 | 1.2 | NA | - | | | at 15.6': Some silt, increased density, decreased sand coarseness. Fining downward to lower contact. More gray in color. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0-2', 8-10' and 10-12' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/10/02 | 12.5' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-36-46

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 2 4 5 7 | 9 | 1.7 | NA | - | SP | | Brown (10 YR 5/3) to yellow-brown (10 YR 5/4) poorly graded fine to medium subrounded to subangular SAND, some to little Silt, few clay, aplastic, no odor, saturated, dense. | SAND | #5 Global filter sandpack 8-20' bgs. |
| | | 10 | 18-20 | 1 4 5 7 | 9 | NA | NA | - | | | | | 2" ID Sch. 40 PVC 0.010" slotted screen 10-20' bgs. |
| 20 | 730 | | | | | | | | | | | | |
| 25 | 725 | | | | | | | | | | | | |
| 30 | 720 | | | | | | | | | | | | |
| 35 | 715 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0-2', 8-10' and 10-12' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/10/02 | 12.5' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/23/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Alan Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** NA<br>**Auger Size:** NA<br>**Rig Type:** Geoprobe | **Northing:** 569630.3<br>**Easting:** 13307170.15<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 22' bgs<br>**Surface Elevation:** 752.41<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-38-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | |
| 0 | | | | | | | FL | | CONCRETE. | FILL | |
| | | 1 | 0-2 | 1.5 | 16.9 | + | SM | | Yellowish-brown (10YR 5/8) SAND, some Silt, trace Clay, moderately loose, dry, slight odor. | SAND | |
| | | | | | | | ML<br>SM | | Dark yellow-brown (10YR 4/4) SILT, some fine to coarse Sand, trace fine Gravel, trace Clay, dry, no odor.<br>SAND as above from 0.5' - 1.3' bgs.<br>SILT as above at 1.3' - 1.6' bgs. | | |
| | 750 | 2 | 2-4 | 2.0 | 26.5 | - | ML | | Very dark gray (10YR 2/1) SILT, some fine to medium Sand, trace fine to coarse subangular Gravel and Clay, moderately dense, slight odor, dry. | SILT | Borehole backfilled with Bentonite to grade. |
| 5 | | 3 | 4-6 | 1.9 | 2.8 | NA | CL | | Gray (10YR 5/1) CLAY, some Silt and fine to coarse Sand, dry, stiff, low plasticity, oxidized, no odor. | CLAY | |
| | | 4 | 6-8 | 1.7 | 10.8 | NA | ML | | Very dark gray-brown 10YR 3/1 SILT, as at 2' - 3.9' bgs, no odor. | SILT | |
| | 745 | 5 | 8-10 | 1.6 | 0.0 | NA | SM | | SAND as above from 0.5' - 1.3' bgs. | SAND | |
| 10 | | 6 | 10-12 | 1.5 | 0.0 | NA | ML<br>SM | | Yellow-brown (10YR 5/6) SILT, some fine Sand, trace Clay, moderately loose, dense, no odor.<br>SAND as above from 0.5' - 1.3' bgs. | SILT<br>SAND | |
| | 740 | 7 | 12-14 | 1.4 | 2.0 | NA | ML<br>SM | | SILT as above at 10.6' - 11.2' bgs.<br>SAND as above from 0.5' - 1.3' bgs.<br>Damp to moist. | SILT<br>SAND | |
| 15 | | 8 | 14-16 | 1.7 | 1.5 | NA | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
+ = Positive Test Result
Samples collected 0.5-2.5', 8.5-10.5' and 18.5-20.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/23/01 | 20.5' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-38-01

**Borehole Depth:** 22' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | 9 | 16-18 | 2.0 | 0.0 | NA | SM | | SAND as above from 0.5' - 1.3' bgs.<br>Sand coarsens - fine to medium. | SAND | Borehole backfilled with Bentonite to grade. |
| | | 10 | 18-20 | 1.5 | 0.4 | NA | | | Wet. | | |
| 20 | | 11 | 20-22 | 2.0 | 4.3 | - | | | Saturated. | | |
| | | | | | | | SP | | Gray (10YR 8/1) fine to medium SAND, moderately dense, saturated, no odor. | | |
| | 730 | | | | | | | | | | |
| 25 | | | | | | | | | | | |
| | 725 | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| | 720 | | | | | | | | | | |
| 35 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
+ = Positive Test Result
Samples collected 0.5-2.5', 8.5-10.5' and 18.5-20.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/23/01 | 20.5' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/19/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 569623.43<br>**Easting:** 13306952.68<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 752.37<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-38-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 7 12 13 15 | 25 | 1.7 | 7759 | - | | | CONCRETE. | FILL | |
| | | | | | | | | | ML | | Yellow-brown (10 YR 5/6) SILT, some Sand, aplastic, moderately dense, no odor. | SILT | |
| | 750 | 2 | 2-4 | 8 14 14 17 | 28 | 1.6 | 2436 | - | | | Thin lenses/varves of oxidation. | | Borehole backfilled with Bentonite Chips to grade. |
| | | 3 | 4-6 | 3 7 4 5 | 11 | 1.4 | 769 | - | | | Black SILT, weak odor. | | |
| 5 | | | | | | | | | | | Concrete rubble and coarse Gravel and Pebbles, angular, aplastic. | | |
| | | 4 | 6-8 | NA | NA | 1.6 | 0.0 | - | ML | | Dark brown-yellow (10 YR 4/6) SILT, little fine subangular to subrounded Sand, little to trace Clay, hard, dry, no odor. At 5.6': Some Clay, trace fine rounded Gravel and fine to coarse Sand. At 6.2': 2" wide area of black (10 YR 2/1) coloration. | SILT | |
| | 745 | 5 | 8-10 | 7 7 6 7 | 13 | 1.2 | 0.0 | - | CL | | Grades to dark brown-yellow (10 YR 4/4) Silty CLAY, little fine to coarse subrounded Sand, trace fine to medium rounded Gravel, medium stiff, no odor, dry. | SILTY CLAY | |
| 10 | | 6 | 10-12 | NA | NA | 1.3 | 0.0 | - | SM | | Brown-yellow (10 YR 6/6) Silty fine subangular SAND, aplastic, moderately loose, no odor, dry.<br>Moist and oxidized at tip of spoon.<br>Damp to dry. | SILTY SAND | |
| | 740 | 7 | 12-14 | 7 8 8 10 | 16 | 1.2 | 0.0 | - | | | Dry. | | |
| 15 | | 8 | 14-16 | 4 4 5 4 | 9 | 2.0 | 0.0 | - | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3', 5-7', 9-11' and 17-19' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/19/01 | 18.8' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-38-02

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | 9 | 16-18 | NA | NA | 1.5 | 0.0 | - | SM | | Brown-yellow (10 YR 6/6) Silty fine subangular SAND, aplastic, moderately loose, no odor, dry. Moist. | SILTY SAND | Borehole backfilled with Bentonite Chips to grade. |
| | | 10 | 18-19 | NA | NA | NA | NA | NA | | | Gray (10 YR 6/1), moist to wet. Wet. | | |
| 20 | | | | | | | | | | | | | |
| | 730 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3', 5-7', 9-11' and 17-19' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/19/01 | 18.8' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/19/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 569496.24<br>**Easting:** 13306946.6<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 21' bgs<br>**Surface Elevation:** 752.4<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-38-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | | | |
| 0 | | | | | | | | | | | CONCRETE. | FILL | |
| | 750 | 1 | 1-3 | 9<br>12<br>15<br>16 | 27 | 1.1 | >9999 | - | ML | | Yellow-brown (10YR 5/6) SILT, little fine subangular to subrounded Sand, aplastic, dense, no odor, dry. | SILT | Borehole backfilled with Bentonite Chips to grade. |
| | | 2 | 3-5 | 7<br>11<br>14<br>16 | 25 | 1.5 | >9999 | - | | | 3" wide layer of dark brown (10 YR 3/3) SILT, trace Clay, trace fine rounded Gravel, loose, no odor, dry. | | |
| 5 | | 3 | 5-7 | 5<br>4<br>3<br>3 | 7 | 1.6 | >9999 | - | | | 1" wide layer of Silt, same as at 4.0' bgs. | | |
| | 745 | 4 | 7-9 | 5<br>5<br>4<br>5 | 9 | 1.8 | 858 | - | | | Very dark gray-brown (10 YR 3/2) SILT, little to some fine subangular to subrounded Sand, trace Clay, aplastic, dense, no odor, damp. | | |
| | | | | | | | | | | | SILT, as at 1.0-7.9' bgs, damp. | | |
| 10 | | 5 | 9-11 | 4<br>8<br>10<br>12 | 18 | 1.7 | 448 | - | | | SILT, as at 7.9-8.7' bgs, but dark brown (10 YR 3/3). | | |
| | 740 | 6 | 11-13 | 5<br>7<br>9<br>11 | 16 | 1.5 | 1307 | - | | | Pale brown (10 YR 6/3) fine subangular Sandy SILT, aplastic, dense, no odor, damp. | SANDY SILT | |
| | | 7 | 13-15 | 7<br>11<br>14<br>16 | 25 | 1.2 | 170 | - | | | Color change to yellow-brown (10 YR 5/4). | | |
| 15 | | 8 | 15-17 | 7<br>8 | 17 | 1.6 | 156 | - | | | Brown-yellow (10 YR 6/6) Silty fine subrounded to subangular SAND, aplastic, dense, no odor, damp to dry. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3', 5-7', 9-11' and 17-19' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/18/01 | 19.5' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-38-03

**Borehole Depth:** 21' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 15-17 | 9 10 | 17 | 1.6 | 156 | - | | | Brown-yellow (10 YR 6/6) Silty fine subrounded to subangular SAND, aplastic, dense, no odor, damp to dry. | SILTY SAND | |
| | 735 | 9 | 17-19 | 5 7 11 13 | 18 | 1.4 | 282 | - | ML | | Moist. | | Borehole backfilled with Bentonite Chips to grade. |
| 20 | | 10 | 19-21 | 2 5 6 8 | 11 | NA | 0.0 | - | SM | | Saturated. Color change to gray (10 YR 5/1) to end of boring. | | |
| | 730 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3', 5-7', 9-11' and 17-19' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/18/01 | 19.5' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 08/22/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4"<br>**Rig Type:** CME 55 | **Northing:** 569654.09<br>**Easting:** 13307320.08<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 26' bgs<br>**Surface Elevation:** 751.58<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-38-04<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | Asphalt | |
| | | 1 | 0-2 | 1 2 2 1 | 4 | 1.5 | 0.0 | - | SM | | Dark yellow-brown (10 YR 4/4) Silty fine subangular to subrounded SAND, few Clay, no odor, aplastic, damp, moderately dense. | SILTY SAND and CLAY |
| | 750 | | | | | | | | CL | | Dark brown (10 YR 3/3) Silty CLAY, some to little fine to medium subangular to subrounded Sand, trace medium to coarse rounded Gravel, no odor, plastic, damp, stiff to soft. | |
| | | 2 | 2-4 | 3 2 2 1 | 4 | 1.0 | 0.0 | - | SM | | Dark yellow-brown (10 YR 4/4) Silty SAND as at 0.2-1.1' bgs. | |
| | | | | | | | | | | | Moist. | |
| 5 | | 3 | 4-6 | 1 1 1 1 | 2 | 1.2 | 0.0 | - | | | Increased Clay to little. | |
| | | | | | | | | | CL | | Dark brown (10 YR 3/3) Silty CLAY as at 1.1-1.5' bgs. | |
| | 745 | 4 | 6-8 | 2 3 3 2 | 6 | 1.3 | 0.0 | - | SM | | Yellow-brown (10 YR 5/6) Silty fine subangular SAND, few Clay, no odor, aplastic, damp, moderately loose.<br>Local decreases in Silt to some. | |
| | | 5 | 8-10 | 2 3 4 2 | 7 | 1.3 | 0.0 | - | | | Yellow-brown (10 YR 5/6) SAND, some Silt, trace Clay, no odor, aplastic, moderately dense to dense, damp. | SAND |
| 10 | 740 | 6 | 10-12 | 1 2 2 2 | 4 | 1.2 | 0.0 | - | SW | | | |
| | | 7 | 12-14 | 3 5 7 7 | 12 | 1.3 | 0.0 | - | SM | | Yellow-brown (10 YR 5/4), SILT, some fine subangular Sand, few to trace Clay, no odor, aplastic, dense, damp. | SILT |
| 15 | | 8 | 14-16 | 4 5 5 7 | 10 | 1.5 | 0.0 | - | SW | | Silty SAND as at 5.5-9' bgs, but brown-yellow (10 YR 6/6) and dense. | SILTY SAN |

**Boring Construction**

- Cement pad with 9" diam. flush-mount cover.
- Grout 1-10' bgs.
- 2" ID Sch. 40 PVC riser 0.2-15' bgs.
- Bentonite seal 10-13' bgs.
- #5 Global filter sandpack 13-26' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 15-25' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.2-2.2', 8.2-10.2' and 16.2-18.2' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/22/01 | 18.5' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-38-04

**Borehole Depth:** 26' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | 9 | 16-18 | 6 7 9 11 | 16 | 1.4 | 0.0 | - | | | Light yellow-brown (10 YR 6/4) SAND as at 9-12.9' bgs, aplastic, moist. | SAND | 2" ID Sch. 40 PVC 0.010" slotted screen 15-25' bgs. |
| | | 10 | 18-20 | 3 5 5 9 | 10 | 1.7 | 0.0 | - | SW | | Saturated. | | |
| 20 | | 11 | 20-22 | 2 4 6 6 | 10 | 1.3 | 0.0 | - | | | Becomes fine to medium and poorly sorted Sand. | | #5 Global filter sandpack 13-26' bgs. |
| | 730 | | | | | | | | | | Becomes fine grained with some Silt and well-sorted. | | |
| | | 12 | 22-24 | 5 7 7 5 | 14 | 1.5 | 0.0 | - | | | | | |
| 25 | | 13 | 24-26 | 2 4 4 4 | 8 | 2.0 | 0.0 | - | SP | | Light brown-gray (10 YR 6/2), fine to coarse subangular SAND, little Silt, trace Clay with increased clay and silt content last 2" to lower contact, no odor, aplastic, saturated, moderately loose to moderately dense. Glacial-alluvial | | |
| | | | | | | | | | CL | | Gray (10 YR 5/1) Silty CLAY, few fine to medium subrounded to subangular Sand, no odor, soft, very plastic, moist to damp. | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.2-2.2', 8.2-10.2' and 16.2-18.2' bgs.

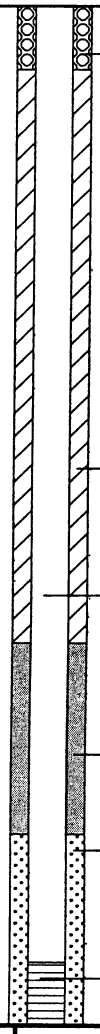
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/22/01 | 18.5' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 8/24/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4"<br>**Rig Type:** CME 55 | **Northing:** 569661.75<br>**Easting:** 13307100.13<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 26' bgs<br>**Surface Elevation:** 750.79<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-38-05<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 750 | 1 | 0-2 | -- 5 8 9 | 13 | 1.7 | NA | - | FL | | Asphalt<br>Aggregate<br>Grayish brown (10YR 5/2) SILT, some Clay, some fine Sand, trace Gravel, damp, slight odor, moderately loose. | FILL |
| | | 2 | 2-4 | 9 9 10 4 | 19 | 1.0 | NA | - | ML | | at 1.9': Dark gray wood in tip of shoe at 1.0' bgs. | SILT |
| 5 | 745 | 3 | 4-6 | 2 2 3 2 | 5 | 1.4 | NA | - | | | Yellowish brown (10YR 5/6) SILT, some fine to medium Sand, trace Clay and Gravel, loose, damp, no odor. | |
| | | 4 | 6-8 | 4 5 7 9 | 12 | 1.4 | NA | - | SP | | Yellow-brown (10YR 5/6) predominantly fine to medium SAND, some Silt, loose, no odor, damp. | SAND |
| | | 5 | 8-10 | 4 4 4 4 | 8 | 1.6 | NA | - | | | | |
| 10 | 740 | 6 | 10-12 | 0 4 4 4 | 8 | 1.4 | NA | - | | | Moist. | |
| | | 7 | 12-14 | 2 2 6 2 | 5 | 1.4 | NA | - | | | Moist to wet. | |
| 15 | 735 | 8 | 14-16 | 2 6 2 2 | 5 | 1.5 | NA | - | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.6-2.6', 8.6-10.6' and 14.6-16.6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/24/01 | 17.2' bgs | |

**Client:**
General Motors

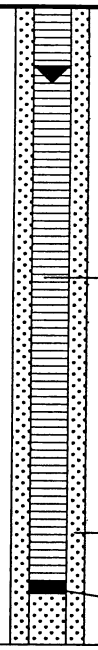
**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-38-05

**Borehole Depth:** 26' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 2 3 4 6 | 7 | 1.5 | NA | - | SP | | Yellow-brown (10YR 5/6) predominantly fine to medium SAND, some Silt, loose, no odor, damp. Saturated. Predominantly medium, no Silt. | SAND |
| | | 10 | 18-20 | 2 3 4 4 | 7 | 1.5 | NA | - | | | | |
| 20 | 730 | 11 | 20-22 | 1 2 2 2 | 4 | 1.5 | NA | - | | | | |
| | | 12 | 22-24 | 1 2 3 4 | 5 | 1.8 | NA | - | | | Grayish brown (10 YR 5/2) fine to coarse SAND, predominantly medium, loose, no odor, saturated. | |
| 25 | 725 | 13 | 24-26 | 3 3 2 1 | 5 | 1.6 | NA | - | ML | | Gray (10YR 5/1) SILT, trace fine Sand and Clay, aplastic, moderately dense, saturated, no odor. Glacial-alluvial. | SILT |
| | | | | | | | | | CL | | Gray (10YR 5/1) CLAY, trace Silt, soft, saturated, no odor, highly pastic. Glacial clay. | CLAY |
| 30 | 720 | | | | | | | | | | | |
| 35 | 715 | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.6-2.6', 8.6-10.6' and 14.6-16.6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/24/01 | 17.2' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 8/24/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4"<br>**Rig Type:** CME 55 | **Northing:** 569667.01<br>**Easting:** 13306861.61<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 22' bgs<br>**Surface Elevation:** 749.43<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-38-06<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 750 | | | | | | | | | | | | |
| 0 | | | | | | | | | FL | | Asphalt | | |
| | | 1 | 0-2 | --<br>9<br>8<br>7 | 17 | 1.5 | NA | NA | ML | | Grayish brown (10YR 5/2) SILT, some Clay and fine to medium Sand, little Gravel and Concrete, moderately loose, damp, no odor. | FILL | Cement pad with 9" diam. flushmount cover |
| | | 2 | 2-4 | 7<br>9<br>6<br>5 | 15 | 0.7 | NA | NA | | | | | Grout 2-10' bgs |
| | 745 | 3 | 4-6 | 2<br>1<br>1<br>8 | 2 | 1.1 | NA | NA | | | Yellowish brown (10YR 5/6) SILT, little Clay and fine Sand, trace Gravel, moist, moderately dense, no odor. | SILT | |
| 5 | | | | | | | | | CL | | Yellow-brown (10YR 5/4) Silty CLAY, little fine Sand, trace coarse angular Gravel, moist, highly plastic, soft, no odor. | SILTY CLAY | |
| | | 4 | 6-8 | 1<br>1<br>2<br>2 | 3 | NA | NA | NA | ML | | Yellow-brown (10YR 5/6) SILT, trace fine to coarse Sand, little Clay; moist, loose, no odor. | silt | 2" ID Sch. 40 PVC riser 0.2-12' bgs |
| | 740 | 5 | 8-10 | 2<br>3<br>2<br>3 | 5 | 1.3 | NA | NA | SP | | Light yellowish brown fine to medium SAND, little Silt, aplastic, loose, damp, no odor. | SAND | Bentonite seal 8-10' bgs |
| 10 | | 6 | 10-12 | 2<br>3<br>2<br>4 | 5 | 1.5 | NA | NA | | | | | |
| | | 7 | 12-14 | 2<br>3<br>5<br>7 | 8 | 1.5 | NA | NA | | | | | #5 Global filter sand pack 10-22' bgs |
| | 735 | 8 | 14-16 | 2<br>3<br>6<br>7 | 9 | 1.4 | NA | NA | | | Pale brown (10YR 6/3) predominantly fine to medium SAND, loose, damp, no odor, little oxidation.<br>Saturated, increased coarseness to predominantly medium, gray (10YR 5/1). | | 2" ID Sch. 40 PVC 0.010" slotted screen 12-22' bgs |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.5-2.5', 8.5-10.5' and 12.5-14.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/24/01 | 14.6' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-38-06

**Borehole Depth:** 22' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 2 4 6 6 | 10 | 1.4 | NA | NA | SP | | Pale brown (10YR 6/3) predominantly medium SAND, loose, damp, no odor, little oxidation. | SAND | #5 Global filter sand pack 10-22' bgs |
| | 730 | 10 | 18-20 | 1 1 2 2 | 3 | 1.4 | NA | NA | | | | | |
| 20 | | 11 | 20-22 | 1 1 3 4 | 4 | 1.8 | NA | NA | | | | | 2" ID Sch. 40 PVC 0.010" slotted screen 12-22' bgs |
| | | | | | | | | | ML | | Gray (10YR 5/1) SILT, little fine Sand, trace Clay, aplastic, saturated, moderately dense, no odor. | SILT | |
| | 725 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.5-2.5', 8.5-10.5' and 12.5-14.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/24/01 | 14.6' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/24/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 561695.16<br>**Easting:** 13305947.21<br>**Casing Elevation:** 733.43<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-40-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | | | | | | | | | | | | |
| 0 | | | | | | | | | FL | | Asphalt. | | |
| | | 1 | 0-2 | - 5 5 2 | 10 | 1.5 | 5.2 | - | | | Black (10 YR 2/1) to very dark grayish-brown (10 YR 3/2) aplastic SILT, some fine to coarse angular sand-sized black Slag (?) and Sand, little fine to coarse subangular to subrounded Gravel, moderate to weak odor, damp, loose. | SILT | |
| | | 2 | 2-4 | 3 2 2 1 | 4 | 1.2 | 5.7 | - | ML | | Yellow-brown (10 YR 5/4) aplastic SILT, some fine subangular Sand, damp, dense, no odor. | | Borehole backfilled with Bentonite Chips to grade. |
| | 730 | | | | | | | | SP | | Gray-brown (10 YR 5/2) fine to coarse angular to subangular SAND, some Clay and Silt, trace fine angular to subangular Gravel, weak odor, wet, loose. | SAND | |
| 5 | | 3 | 4-6 | 4 4 6 8 | 10 | 2.0 | 7.2 | - | CL | | Yellow-brown (10 YR 5/4) CLAY, some Silt, little fine to medium subrounded to subangular Sand, trace fine to coarse rounded to subrounded Gravel, heavily oxidized with patches of original gray (10YR5/1) color, no odor, dry to damp, very stiff to hard (pp=4.0 to 4.5 tons/sq. feet). | CLAY | |
| | | 4 | 6-8 | 4 7 10 13 | 17 | 2.0 | 7.8 | - | | | | | |
| | 725 | 5 | 8-10 | 3 7 10 12 | 17 | 2.0 | 8.5 | - | | | pp >= 4.5 tons/sq. feet, friable. | | |
| 10 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA=Not Applicable/Not Available.
Temporary well screen placed 2 to 7' bgs.
Samples collected 0.3 - 2.3' bgs.
pp=pocket penetrometer measurement

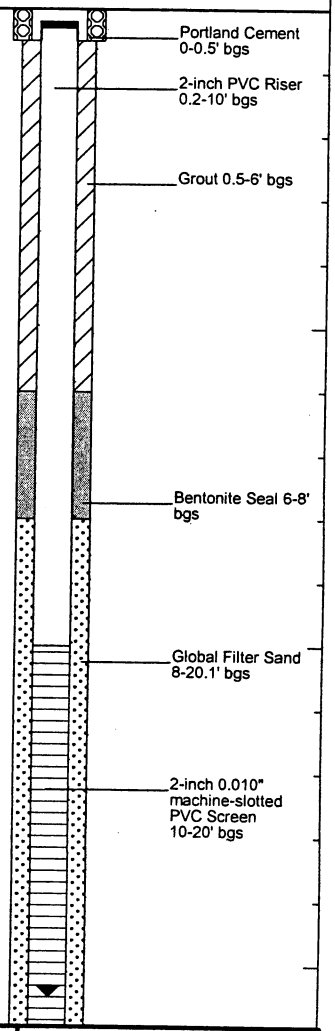
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/24/01 | 3.3' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/25/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3-1/4" ID HSA<br>**Rig Type:** CME 55 | **Northing:** 561517.49<br>**Easting:** 13305773.70<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20.1' bgs<br>**Surface Elevation:** 735.35<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-40-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 735 | | | | | | FL | CONCRETE. | FILL |
| | | | | | 6.9 | - | CL | Yellow-brown (10YR 5/4) Silty lean CLAY, few medium to coarse subrounded to subangular Sand, trace fine rounded Gravel, plastic, stiff, no odor, stiff. | SILTY CLAY |
| | | 1 | 0-4 | 2.8 | | | | | |
| | | | | | 1.4 | - | | | |
| 5 | 730 | | | | 6.7 | - | SM | Brown-gray (10YR 5/2) Silty fine subangular poorly-graded SAND, aplastic, weak to moderate odor, moderately dense, moist, oily sheen (pale brown oil). | |
| | | 2 | 4-8 | 3.8 | | | CL | Silty lean CLAY as above from 0.9' - 4.5' bgs, locally soft and moist in patches, Brown (10YR 5/3) Silt lenses up to 6" thick throughout, moist. | SILTY CLAY |
| | | | | | 5.0 | + | | | |
| | | | | | 9.0 | + | | | |
| 10 | 725 | 3 | 8-12 | 4.0 | | | | | |
| | | | | | 4.4 | + | | | |
| | | | | | 6.2 | + | | Gray-brown (10YR 5/2), hard, homogenous. | |
| | | 4 | 12-16 | 2.0 | | | | Gray (10YR 5/1) occasional moist to wet Silt lenses up to 2" thick througout. | |
| 15 | 720 | | | | 7.1 | + | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.9-2.9 and 8.9-10.9' bgs.
+ = Positive Test Result

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/25/02 | 15.5 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-40-02

**Borehole Depth:** 20.1' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Silty lean CLAY as above from 0.9' - 4.5' bgs, locally soft and moist in patches, Brown (10YR 5/3) Silt lenses up to 6" thick throughout, moist. | | Global Filter Sand 8-20.1' bgs; 2-inch 0.010" machine-slotted PVC Screen 10-20' bgs; PVC Cap |
| 20 | 715 | | | | | | | | | | |
| 25 | 710 | | | | | | | | | | |
| 30 | 705 | | | | | | | | | | |
| 35 | 700 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.9-2.9 and 8.9-10.9' bgs.
+ = Positive Test Result

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/25/02 | 15.5 | |

**Date Start/Finish:** 1/30/02
**Drilling Company:** Rau Drilling
**Driller's Name:** Greg Compeau
**Drilling Method:** Direct Push
**Sampler Size:** NA
**Auger Size:** NA
**Rig Type:** Truck-mounted Geoprobe

**Northing:** 561334.28
**Easting:** 13305776.41
**Casing Elevation:** NA

**Borehole Depth:** 16' bgs
**Surface Elevation:** 735.33

**Descriptions By:** SM Duly

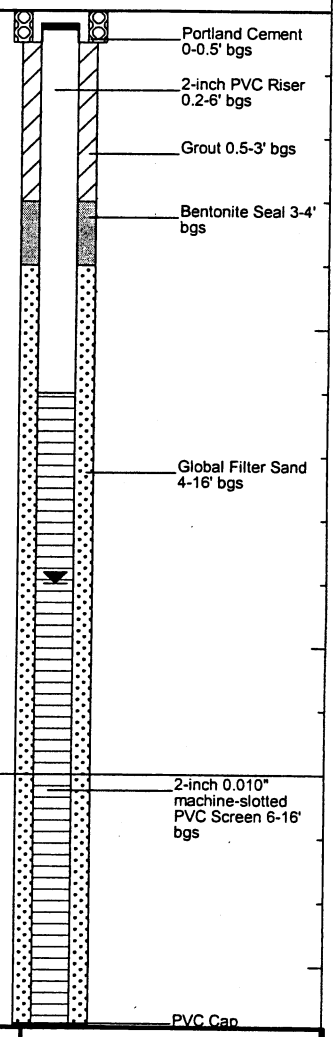
**Boring ID:** RFI-40-03R

**Client:** General Motors

**Location:** GM Flint
Flint, Michigan

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 735 | | | | | | FL | | CONCRETE. | FILL |
| | | 1 | 0-4 | 3.8 | 0.0 | - | SW | | Yellow-brown (10YR 6/4) fine to coarse subangular well-graded SAND, little Silt, few Clay, no odor, dense, dry. Fill Sand. | SAND |
| | | | | | 0.0 | - | CL | | Yellow-brown (10YR 5/4) Silty lean CLAY (CL), few fine to coarse subrounded Sand, trace fine rounded Gravel, no odor, dry, stiff, weakly plastic, 3" of Slag at top of unit. Glacial Clay Till. | CLAY |
| 5 | 730 | 2 | 4-8 | 3.5 | 0.0 | - | SW | | Yellow-brown (10YR 6/4) fine to coarse well-graded SAND as above from 0.7-3' bgs, aplastic. | SAND |
| | | | | | 0.0 | - | | | Fines downward, moist. | |
| 10 | 725 | 3 | 8-12 | 2.9 | 6.7 | + | | | Saturated, moderate odor. | |
| | | | | | 985 | + | ML | | Brown (10YR 5/2) SILT, little Clay, weak odor, saturated, dense, aplastic. | SILT |
| 15 | 720 | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.7-2.7' and 6.7-8.7' bgs.
+ = Positive Test Result

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 9.0 | 1/30/02 | |

**Date Start/Finish:** 1/15/02
**Drilling Company:** Rau Drilling
**Driller's Name:** Alan Rau
**Drilling Method:** HSA/SS
**Sampler Size:** 2' x 2" ID
**Auger Size:** 4 1/4" ID
**Rig Type:** CME 75

**Northing:** 561788.64
**Easting:** 13305745.70
**Casing Elevation:** 738.17

**Borehole Depth:** 33' bgs
**Surface Elevation:** 738.44

**Descriptions By:** SM Duly

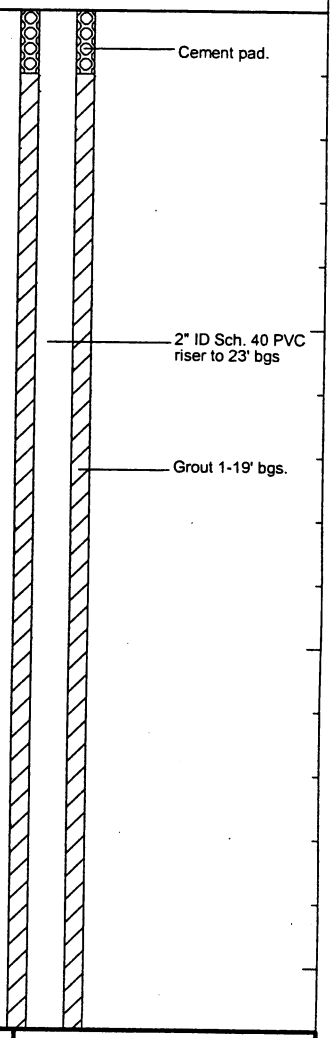
**Boring ID:** RFI-40-04

**Client:** General Motors

**Location:** GM Flint
Flint, Michigan

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | |
| 0 | | | | | | | | | FL | Asphalt. | FILL |
| | | 1 | 0-2 | - 9 7 8 | 16 | 1.8 | NA | - | SW | Brown (10 YR 5/3) fine to coarse angular well-graded SAND, some to little Silt, few fine to medium angular Gravel, aplastic, no odor, damp, dense. | SILTY SAND |
| | | 2 | 2-4 | 5 6 9 11 | 15 | 1.4 | NA | - | SM | Black (10 YR 5/1) Silty fine subangular poorly-graded SAND, little Clay, aplastic, no odor, damp, dense. Foundry sand. | |
| | 735 | | | | | | | | SW | Yellow-brown (10 YR 5/4) fine to coarse subrounded to subangular well-graded SAND, little Silt, few fine to coarse rounded Gravel and Clay, aplastic, no odor, moist, dense. | SAND |
| 5 | | 3 | 4-6 | 6 7 9 10 | 16 | 1.6 | NA | - | CL | Gray (10 YR 5/1) Silty CLAY, little fine to coarse subangular to subrounded Sand, few fine to coarse rounded Gravel, weakly plastic, no odor, dry, very stiff to hard. Clay Till. | SILTY CLAY |
| | | 4 | 6-8 | 4 8 9 12 | 17 | 2.0 | NA | - | | | |
| | 730 | 5 | 8-10 | 3 6 9 11 | 15 | 2.0 | NA | - | | Damp. | |
| 10 | | 6 | 10-12 | 4 14 15 19 | 29 | 2.0 | NA | - | | | |
| | 725 | 7 | 12-14 | 7 13 20 23 | 33 | 1.8 | NA | - | | Dry. | |
| 15 | | 8 | 14-16 | 6 11 17 24 | 28 | 2.0 | NA | - | ML | Gray (10 YR 5/1) SILT, some Clay, aplastic, no odor, damp, dense. Glacial till. | SILT |

Boring Construction




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.5-2.5', 8.5-10.5' and 22.5-24.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/15/02 | 26' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

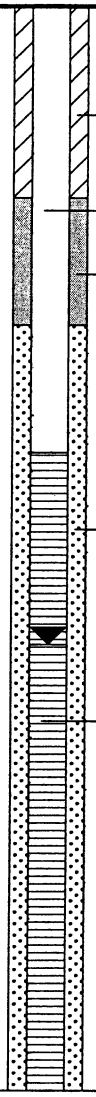
**Boring ID:** RFI-40-04

**Borehole Depth:** 33' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 6 15 21 26 | 36 | 2.0 | NA | - | ML | Gray (10 YR 5/1) SILT, some Clay, rare fine rounded Gravel, aplastic, no odor, damp, dense. Glacial till. | SILT |
| | 720 | 10 | 18-20 | 7 19 29 34 | 48 | 2.0 | NA | - | ML | | SILT |
| 20 | | 11 | 20-22 | 12 29 33 34 | 62 | 2.0 | NA | - | ML | Rare fine to coarse rounded Sand. | SILT |
| | 715 | 12 | 22-24 | 8 23 28 25 | 51 | 2.0 | NA | - | ML | Damp. | SILT |
| 25 | | 13 | 24-26 | 8 25 25 30 | 50 | 2.0 | NA | - | ML | Moist. | SILT |
| | | 14 | 26-28 | 9 25 26 30 | 51 | 2.0 | NA | - | ML | 2" wide saturated silt seam. | SILT |
| | 710 | 15 | 28-30 | 8 28 31 50/5" | 59 | 1.8 | NA | - | SW | Gray (10 YR 5/1) fine to coarse subangular well-graded SAND, little Silt, some fine to coarse rounded Gravel, few Clay, aplastic, no odor, saturated, dense. Coarsens downward to lower contact. Glacial-alluvial. | SAND |
| 30 | | 16 | 30-33 | 13 50/5" | NA | 0.8 | NA | - | SW | Occasional silt lenses up to 8" wide throughout. | SAND |
| | 705 | | | | | | | | | | |
| 35 | | | | | | | | | | | |

Geologic Column

Boring Construction




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.5-2.5', 8.5-10.5' and 22.5-24.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/15/02 | 26' bgs | |

**Date Start/Finish:** 1/17/02
**Drilling Company:** Rau Drilling
**Driller's Name:** Greg Compeau
**Drilling Method:** HSA/SS
**Sampler Size:** 2' x 2" ID
**Auger Size:** 4 1/4" ID
**Rig Type:** CME 75

**Northing:** 561565.67
**Easting:** 13305995.90
**Casing Elevation:** NA

**Borehole Depth:** 16' bgs
**Surface Elevation:** 732.04

**Descriptions By:** SM Duly

**Boring ID:** RFI-40-05

**Client:** General Motors

**Location:** GM Flint
Flint, Michigan

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | Concrete. | FILL | |
| | | 1 | 0-2 | 2 5 2 4 | 7 | 1.6 | 0.0 | - | SM | | Yellow-brown (10 YR 5/4) Silty fine to coarse subangular well-graded SAND, little Clay, aplastic, no odor, moist, moderately dense. Very dark brown (10 YR ). | SILTY SAND | |
| | | 2 | 2-4 | 2 4 4 3 | 8 | 1.3 | 0.0 | - | | | Yellow-brown (10 YR 5/4), finer grained. | | |
| 5 | 5 | 3 | 4-6 | 4 4 6 10 | 10 | 1.5 | 0.0 | - | CL | | Yellow-brown (10 YR 5/4) Silty CLAY, little fine to medium subangular to subrounded Sand, occasional fine to coarse rounded Gravel, moderately plastic, no odor, moist, soft, becoming stiff with depth. Clay Till. Dry at 4.8' bgs. | SILTY CLAY | Borehole backfilled with bentonite to grade. |
| | | 4 | 6-8 | 5 12 14 23 | 26 | 1.7 | 0.0 | - | | | Local gray (10 YR 6/1) mottling throughout. | | |
| | | 5 | 8-10 | 7 12 16 14 | 28 | 2.0 | 5.5 | + | | | 8-9.3' bgs: Black oily material present, moderate odor, oily sheen. | | |
| 10 | 10 | 6 | 10-12 | 5 10 13 16 | 23 | 2.0 | 0.0 | + | ML | | Yellow-brown SILT, little to some Clay, few fine to medium rounded to subrounded Sand, occasional fine rounded Gravel, aplastic, weak odor, dry, dense. Gray (10 YR 5/1) glacial till (?) at 10' bgs. | SILT | |
| | | 7 | 12-14 | 6 11 14 16 | 25 | 1.8 | 352 | + | | | Wet. | | |
| 15 | 15 | 8 | 14-16 | 4 9 11 11 | 20 | 1.3 | 715 | + | SW | | Black (10 YR 2/1) fine to coarse subangular to subrounded well-graded SAND, little Silt, trace Clay, moderate odor, oily sheen, saturated, moderately dense. | SAND | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.8-2.8', 8.8-10.8' and 10.8-12.8' bgs.
+ = Positive Test Result

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/17/02 | 13.8' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/17/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 75 | **Northing:** 561540.10<br>**Easting:** 13306087.63<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 732.98<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-40-06<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | Concrete. | FILL | |
| | | 1 | 1-3 | 46<br>50/<br>3" | NA | 0.8 | 0.0 | + | SW | | Brown (10 YR 5/3) fine to coarse subrounded to subangular well-graded SAND, little fine to medium rounded Gravel, few to little Silt, aplastic, no odor, dry, moderately loose. Slag and cement debris present. | SAND | |
| | | 2 | 3-5 | 5<br>6<br>4<br>4 | 10 | 1.4 | 0.0 | + | SM | | Black (10 YR 2/1) Silty fine to coarse subrounded to subangular SAND, little Clay, aplastic, moderate odor, oily sheen, damp to moist, moderately dense. Fill. | SILTY SAND | |
| 5 | 5 | 3 | 5-7 | 3<br>5<br>7<br>7 | 12 | 2.0 | 0.4 | + | CL | | Dark gray-brown (10 YR ) Silty CLAY, little fine to coarse subangular Sand, plastic, moderate odor, oily sheen, moist, soft.<br>Gray (10 YR 5/1) with brown (10 YR 4/3) mottling. Dry, moderate odor, increasing stiffness with depth. Till. | SILTY CLAY | Borehole backfilled with bentonite to grade. |
| | | 4 | 7-9 | 6<br>8<br>13<br>15 | 21 | 1.8 | 0.0 | + | | | Gray (10 YR 6/1) with yellow-brown (10 YR 5/4), black oily sheen absent, no odor, dry. | | |
| 10 | 10 | 5 | 9-11 | 3<br>5<br>8<br>11 | 13 | 2.0 | 0.0 | + | ML | | Brown (10 YR 5/3) SILT, little Clay, few fine to coarse rounded Sand, aplastic, moderate odor, light brown oily sheen, damp to moist, dense. Possible native till. | SILT | |
| | | 6 | 11-13 | 8<br>10<br>14<br>17 | 24 | 2.0 | 1.3 | + | | | Gray (10 YR 5/1), weak odor. Till. | | |
| | | 7 | 13-15 | 9<br>19<br>25<br>28 | 44 | 1.8 | 0.0 | + | | | | | |
| 15 | 15 | 8 | 15-17 | 7<br>13 | 32 | 2.0 | 0.0 | + | | | Gray (10 YR 6/1) homogeneous, no odor, dry. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available
Samples collected 1-3', 9-11', 11-13' and 15-17' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/17/02 | 17.3' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-40-06

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 15-17 | 19 14 | 32 | 2.0 | 0.0 | + | ML | | Gray (10 YR 6/1) SILT, little Clay, few fine to coarse rounded Sand, aplastic, no odor, dry. | SILT | Borehole backfilled with bentonite to grade. |
| | | 9 | 17-19 | 8 11 11 8 | 22 | 1.0 | 1852 | + | SW | | Dark brown (10 YR 3/3) to black (10 YR 2/1) to brown (10 YR 5/3) mottled fine to medium subangular to subrounded well-graded SAND, little Silt, strong odor, oily medium brown to black sheen, moderately dense. Glacial-alluvial. | SAND | |
| 20 | 20 | | | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available
Samples collected 1-3', 9-11', 11-13' and 15-17' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/17/02 | 17.3' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/18/02 - 1/22/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 75 | **Northing:** 561505.40<br>**Easting:** 13306168.50<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 729.35<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-40-07<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | | | |
| 0 | | | | - | | | | | FL | | Concrete. | FILL | Cement pad with flushmount cover |
| | | 1 | 0-2 | - 3 3 | 3 | 1.0 | 0.0 | - | SP | | Yellow-brown (10 YR 5/4) fine subangular poorly-graded SAND, little Silt, aplastic, no odor, damp, moderately loose. | SAND | Grout 1-3' bgs |
| | | 2 | 2-4 | 2 2 3 7 | 5 | 1.2 | 0.0 | - | SM | | Yellow-brown (10 YR 5/4) Silty fine subangular poorly graded SAND, few Clay, aplastic, no odor, saturated to wet, loose to moderately dense. | | |
| | 725 | | | | | | | | | | | | |
| 5 | | 3 | 4-6 | 2 4 4 6 | 8 | 1.8 | 0.0 | NA | CL | | Gray (10 YR 6/1), with extensive yellow-brown (10 YR 5/4) mottling (possible oxidation), Silty CLAY, little fine to coarse subangular to subrounded Sand, trace fine rounded Gravel, plastic, no odor, moist to damp, becomes stiffer and drier with depth. Glacial Till. | SILTY CLAY | Bentonite seal 3-7' bgs |
| | | 4 | 6-8 | 6 9 11 12 | 20 | 2.0 | 0.0 | - | | | | | 2" ID Sch. 40 PVC riser 0.2-9' bgs |
| | | | | | | | | | ML | | Yellow-brown (10 YR 5/4) SILT, some Clay, few fine to medium rounded Gravel, aplastic, no odor, moist, dense. | SILT | |
| | 720 | 5 | 8-10 | 3 7 9 12 | 16 | 1.5 | 0.0 | - | CL | | Silty CLAY, as at 4.3-7.2' bgs, but yellow-brown (10 YR 5/4) throughout. | SILTY CLAY | |
| 10 | | 6 | 10-12 | 6 9 18 24 | 27 | 2.0 | 0.0 | - | | | Color change to dark gray-brown (10 YR 4/2), dry, hard. Clay till to 16' bgs. | | Global filter sand pack 7-20' bgs |
| | | 7 | 12-14 | 7 11 24 31 | 35 | 2.0 | 0.0 | - | | | Homogeneous gray (10 YR 5/1). | | 2" ID Sch. 40 PVC 0.010" slotted screen 9-19' bgs |
| | 715 | | | | | | | | | | | | |
| 15 | | 8 | 14-16 | 9 14 19 18 | 33 | NA | 0.0 | - | | | 14.3-14.5': fine to coarse subangular sand lens, moist, loose. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0.7-2.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/18/02 | 3.2' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-40-07

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 7, 14, 24, 31 | 38 | 2.0 | 0.0 | - | ML | | Gray (10 YR 5/1) SILT, little Clay, few fine to coarse subrounded to rounded Sand, rare medium rounded Gravel, aplastic, no odor, dry, dense. Glacial till. | SILT | 2" ID Sch. 40 PVC 0.010" slotted screen 9-19' bgs |
| 20 | 710 | 10 | 18-20 | 8, 19, 23, 27 | 42 | NA | 0.0 | - | | | | | Global filter sand pack 7-20' bgs |
| 25 | 705 | | | | | | | | | | | | |
| 30 | 700 | | | | | | | | | | | | |
| 35 | 695 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0.7-2.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/18/02 | 3.2' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/25/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4-1/4" ID HSA<br>**Rig Type:** CME 55 ATV | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-40-08<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-2 | 2 2 2 2 | 4 | 1.2 | 0.0 | - | GP | | Coarse grained poorly graded angular GRAVEL (GP), little coarse grained angular Pebbles, aggregate.<br>ASPHALT and Concrete rubble. | Asphalt | Boring backfilled with bentonite to grade. |
| | | 2 | 2-4 | 2 2 3 4 | 5 | 0.8 | 0.0 | - | CL | | Dark brown (10YR 3/3) to dark yellow-brown (10YR 4/4) Silty CLAY (CL), soft, highly plastic, little fine to medium subangular to subrounded Sand, no odor, moist. | Silty Clay | |
| 5 | 5 | 3 | 4-6 | 3 4 5 7 | 9 | 1.7 | 0.0 | - | SW | | Yellow-brown (10YR 5/4) angular, well-graded SAND (SW), some Silt, little fine to coarse grained angular Gravel, no odor, saturated, moderately dense, aplastic. | F. Sand | |
| | | 4 | 6-8 | 4 7 13 18 | 20 | 1.8 | 0.0 | - | CL | | Gray (10YR 5/1) with dark yellow-brown (10YR 4/4) lean Silty CLAY (CL), few fine to coarse grained subangular to subrounded Sand, trace fine to medium rounded Gravel, weakly plastic, no odor, dry.<br>Moist, homogeneous, yellow-brown (10YR 5/4), trace Sand, no Gravel, stiff. | Silty Clay | |
| | | 5 | 8-10 | 5 10 14 18 | 24 | 2.0 | 0.0 | - | | | Increase in gray color (10YR 5/2), increased stiffness to very stiff, dry, little Sand and trace Gravel as above. | | |
| 10 | 10 | 6 | 10-12 | 3 4 7 8 | 11 | 2.0 | 0.0 | - | | | Homogeneous, gray (10YR 5/1).<br>Yellow-brown (10YR 5/4), oxidized.<br>Increased moisture, decreased stiffness. | | |
| | | 7 | 12-14 | 3 8 9 10 | 17 | 2.0 | 0.0 | - | | | | | |
| 15 | 15 | 8 | 14-16 | 4 5 7 10 | 12 | 1.8 | 0.0 | - | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/24/02 | 4.7' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-40-08

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 1 1 1 1 | 2 | 1.0 | 0.0 | - | ML | | Gray (10YR 5/1) SILT (ML), some to little Clay, aplastic, no odor, dense, saturated. | Silt | |
| | | | | | | | | | SP | | Gray (10YR 5/1) fine to medium subrounded to subangular poorly graded SAND (SP), little Silt, trace Clay, aplastic, no odor, saturated, loose. | F. Sand | |
| 20 | 20 | | | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available

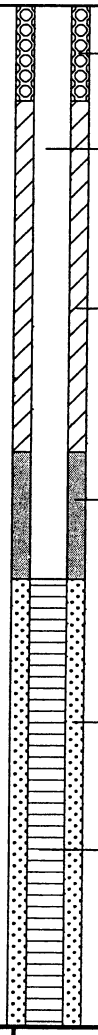
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/24/02 | 4.7' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/25/02<br>**Drilling Company:** RAU<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA - split spoon<br>**Sampler Size:** 2"x2" ID split spoon<br>**Auger Size:** 4-1/4" ID HSA<br>**Rig Type:** CME 55 ATV | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19'<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-40-09<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | NA | 0-0.7 | NA | NA | NA | NA | NA | | | CONCRETE. | Concrete |
| | | 1 | 0.7-2.7 | 4 6 7 9 | 13 | 1.6 | 0.0 | - | SW | | Black (10YR 2/1) fine to coarse grained subangular to subrounded SAND (SW), well graded, some Silt, few fine to coarse grained subrounded Gravel, no odor, moist, dense.<br>Becomes more brown. | Sand |
| | | 2 | 2.7-4.7 | 4 4 7 10 | 11 | 1.8 | 0.0 | - | CL | | Yellow-brown (10YR 5/4) with gray 10YR 6/1 mottling, Silty lean CLAY (CL), few fine to coarse subrounded Sand, trace fine to medium subrounded to rounded Gravel, weakly plastic, stiff, no odor, damp becoming dry with depth.<br>Becomes mottled with gray (10YR 6/1). | Silty Clay |
| 5 | 5 | 3 | 4.7-6.7 | 4 6 9 9 | 15 | 2.0 | 25.5 | + | | | Moderate odor, oily sheen, oil in voids of Clay.<br>Black mottling/varves present. | |
| | | 4 | 6.7-8.7 | 4 7 7 9 | 14 | 2.0 | 22.3 | + | | | Occasional Silt lense up to 2" wide.<br>Decrease in odor, decrease in oil residue. | |
| 10 | 10 | 5 | 8.7-10. | 4 6 7 9 | 13 | 2.0 | 0.0 | - | | | Becomes gray (10YR 6/1), homogeneous, no odor, no oil, dry. | |
| | | 6 | 10.7-12 | 4 5 7 8 | 15 | 1.8 | 0.0 | - | ML | | Gray (10YR 5/1) SILT (ML), little Clay, no odor, dense, aplastic, moist, becomes saturated at 12' bgs. | Silt |
| | | 7 | 12.7-14 | 6 9 10 13 | 19 | 1.6 | 697 | + | SW | | Gray (10YR 5/1), fine to coarse grained subrounded to rounded SAND (SW), well graded, little Silt, saturated, moderate odor, aplastic. | Sand |
| 15 | 15 | 8 | 14.7-16 | 5 9 | 20 | 1.5 | 1086 | + | | | Fining downwards, fine to medium grained, trace coarse grained Sand. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/25/02 | 12' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-40-09

**Borehole Depth:** 19'

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 14.7-16 | 11<br>11 | 20 | 1.5 | 1086 | + | SW | | Gray (10YR 5/1), fine to coarse grained subrounded to rounded SAND (SW), well graded, little Silt, saturated, moderate odor, aplastic. | Sand | Global Filter Sand (9.0' - 19' bgs)<br>2-inch 0.010" machine-slotted PVC Screen (9.0' - 19' bgs)<br>PVC Cap |
| | | 9 | 16.7-19 | 3<br>5<br>5<br>6 | 10 | 2.0 | 973 | + | | | | | |
| 20 | 20 | | | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/25/02 | 12' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/30/02<br>**Drilling Company:** RAU<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** Geoprobe<br>**Sampler Size:** NA<br>**Auger Size:** NA<br>**Rig Type:** Truck-Mounted Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12' below grade<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-40-10<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | FL | | CONCRETE. | Fill | |
| | | | | | 0.0 | - | SP | | Yellow-brown (10YR 5/4) fine to medium poorly-graded subangular SAND (SP), trace coarse subrounded Sand, little Silt, aplastic, no odor, dense, dry. | Sand | |
| | | 1 | 0-4 | 3.6 | | | | | | | 2" diameter PVC Riser (0 - 7.0' bgs) |
| | | | | | | | | | Occasional patches of black Slag and foundry Sand at 2.5' bgs. | | |
| | | | | | 0.0 | - | | | | | |
| | | | | | | | | | Increased Clay content to little at 3.8' bgs. | | |
| 5 | 5 | | | | 0.0 | - | | | | | |
| | | 2 | 4-8 | 2.0 | | | | | Silty Sand, wet from 6.0' - 6.6' bgs. | | |
| | | | | | 0.0 | - | CL | | Yellow-brown (10YR 6/4) Silty Lean CLAY (CL), few fine to coarse subrounded Sand, trace fine to medium rounded Gravel, weakly plastic, stiff, no odor, dry. Native Glacial Clay Till. | Clay | |
| | | | | | 0.0 | - | SM | | Yellow-brown (10YR 5/4) well-graded Silty fine to coarse subrounded SAND (SM), little to few Clay, aplastic, saturated, loose, no odor. | Silty Sand | 2" diameter PVC Screen (7.0' - 12' bgs) |
| 10 | 10 | 3 | 8-12 | 2.0 | | | | | | | |
| | | | | | 0.0 | - | CL | | Silty Lean CLAY (CL), as above from 6.8' - 8.0' bgs with gray (10YR 6/1) Silt lenses. | Silty Clay | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/30/02 | 8.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/17/01<br>**Drilling Company:** RAU<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 560810.62<br>**Easting:** 13305509.82<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** 731.26<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-44-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | | | |
| | 730 | 1 | 0-2 | NA<br>4<br>18<br>11 | 22 | 1.3 | 9.1 | + | FL<br>SP | | CONCRETE<br>Yellow-brown (10 YR 5/4) aplastic fine to medium subrounded to subangular SAND, some Silt, little to few Clay, moderately loose, no odor, damp. | Fill<br>Sand | Borehole backfilled with Bentonite to grade. |
| | | 2 | 2-4 | NA | NA | NA | NA | NA | ML<br>FL | | Black (10 YR 2/1) SILT, little to few Clay, aplastic, moderate odor, moderately dense, damp. Slag and Foundry Sand mix.<br>CONCRETE | Fill | |
| 5 | | 3 | 4-6 | 10<br>17<br>20<br>18 | 37 | 1.7 | 7.8 | - | SP | | Dark yellow-brown (10 YR 4/4) fine to medium subangular aplastic SAND, some Silt, trace Clay, aplastic, no odor, loose, dry.<br>(4.5-6.4) Yellow-brown 10 YR 5/8 fine to coarse subangular SAND, some fine to coarse subrounded to subangular Gravel, little Silt, moderately dense to locally loose, no odor, damp to moist, saturated at 6' bgs. | Sand<br>Sand | |
| | 725 | 4 | 6-8 | 7<br>12<br>13<br>13 | 25 | 2.0 | 7.6 | - | CL | | Gray (10 YR 5/1) homogeneous CLAY, some Silt, little fine to medium subangular to subrounded Sand, trace to few fine to coarse rounded Gravel, occasional lenses of increased Silt up to 2" wide, no odor, hard (pp>4.5 tons/sq. ft.) Clay Till. | Clay | |
| | | 5 | 8-10 | 12<br>20<br>21<br>25 | 41 | 2.0 | 5.7 | - | | | | | |
| 10 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
pp=pocket penetrometer reading;
NA = Not Applicable/Not Available.
Set temp well screened 5.0'-10.0' bgs.
Samples collected 0.7-2' and 4-6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/17/01 | 6' bgs | NA |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/17/01<br>**Drilling Company:** RAU<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID SS<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 560635.41<br>**Easting:** 13305509.87<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14' below grade<br>**Surface Elevation:** 733.0<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-44-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | |
| | | 1 | 0-2 | NA<br>4<br>5<br>4 | 9 | 1.2 | 1.8 | - | FL | | CONCRETE. | Fill | |
| | | | | | | | | | SP | | Yellow-brown (10YR 5/4) fine to medium subangular SAND, some Silt, little rounded fine to coarse Gravel, fine to medium Fill, no odor, loose, dry. | Sand | |
| | | | | | | | | | ML | | Black (10YR 2/1) SILT, few Clay, few fine to medium subangular Sand, medium loose, no odor, dry. | Silt | Borehole backfilled with Bentonite to grade. |
| | 730 | 2 | 2-4 | 4<br>4<br>3<br>4 | 7 | 1.5 | 4.5 | + | SP | | SILT as above, but red (10YR 4/6). | | |
| | | | | | | | | | | | Layered lenses of dark yellow-brown (10YR 4/4) fine to medium subangular SAND, little to few Silt, layered with black to dark brown (10YR 3/3) SILT as above, no odor, dense, damp. | Sand | |
| | | | | | | | | | ML | | Black (10YR 2/1) SILT as above, locally oxidized to dark yellow-brown (10YR 4/4) fine to coarse sand to gravel-sized angular Slag. | Silt | |
| 5 | | 3 | 4-6 | 4<br>NA<br>NA<br>NA | NA | 0.5 | 8.4 | + | FL | | CONCRETE. | Fill | |
| | | 4 | 6-8 | NA | NA | NA | NA | NA | | | | | |
| | 725 | | | | | | | | | | | | |
| | | 5 | 8-10 | 5<br>5<br>5<br>8 | 10 | 1.6 | 12.3 | - | ML | | Gray (10YR 5/1) SILT, some Clay, locally increased to a Clayey Silt, few fine subangular Sand, no odor, dense, moist. Brown 10YR 5/3, no odor, saturated. | Silt | |
| 10 | | | | | | | | | CL | | Dark gray (10YR 4/1) CLAY, some Silt, little fine to medium subangular to subrounded Sand, few rounded fine to coarse Gravel, hard (pp>4.5 tons/sq. ft.), homogeneous, no odor, dry. | Clay | |
| | | 6 | 10-12 | 2<br>4<br>4<br>7 | 8 | 1.8 | 6.9 | - | ML | | SILT, as from 8' - 9.5' bgs, saturated. | Silt | |
| | 720 | 7 | 12-14 | 4<br>5<br>5<br>6 | 10 | 1.7 | 4.6 | - | CL | | Gray (10YR 4/1) CLAY, as from 9.5' - 10' bgs. | Clay | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available.
Temporary well set 8-13' bgs; pp=pocket penetrometer reading
Samples collected 0.7-2', 2-4' and 4-6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/17/01 | 8.7' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/17/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 560500.35<br>**Easting:** 13305478.46<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** 733.31<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-44-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | |
| | | | | NA | | | | | FL | | ASPHALT. | Fill | |
| | | 1 | 0-2 | 3<br>4<br>5 | 7 | 1.0 | 8.7 | - | | | Light yellow-brown (10 YR 6/4) fine to medium subangular poorly graded SAND, mostly fine-grained, some Silt, trace Clay, aplastic, no odor, dry, loose. (Fill) | | |
| | | 2 | 2-4 | 1<br>1<br>1<br>1 | 2 | 1.5 | 6.0 | - | | | As above, dense. | | Borehole backfilled with Bentonite to grade. |
| | 730 | | | | | | | | | | Damp. | | |
| 5 | | 3 | 4-6 | 1<br>1<br>1<br>1 | 2 | 0.2 | 3.4 | - | SP | | | SAND | |
| | | 4 | 6-8 | 1<br>11<br>2<br>1 | 3 | 0.4 | 4.0 | - | | | | | |
| | 725 | 5 | 8-10 | 3<br>2<br>2<br>1 | 4 | 2.0 | 4.6 | - | | | Wet. | | |
| 10 | | 6 | 10-12 | 2<br>1<br>2<br>4 | 3 | NA | 3.5 | - | CL | | Dark gray-brown (10 YR 4/2) aplastic SILT with CLAY, little fine to coarse subangular Sand, no odor, wet, dense. Localized increases in gravel to some in lenses up to 1-2" wide. | SILT and CLAY | |
| | | | | | | | | | | | Homogeneous dark gray (10 YR 4/1) lean CLAY, some Silt, little fine to medium subangular to subrounded Sand, few fine to coarse rounded Gravel, no odor, dry, hard (pp>=4.5 tons/sq. feet). Clay Till. | | |
| | 720 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; pp=pocket penetrometer
NA = Not Applicable/Not Available.
Temporary well screen from 7-12' bgs.
Samples collected 0.9-2' and 6-8' bgs.

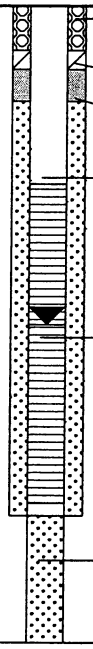
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/17/01 | 9.5' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/16/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 560450.3<br>**Easting:** 13305379.74<br>**Casing Elevation:** 731.89<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** S.M. Duly | **Boring ID:** RFI-44-04<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | - | | | | | | | ASPHALT. | Fill |
| | | 1 | 0-2 | 4<br>4<br>5 | 8 | 1.0 | 3.0 | + | ML | | Yellow-brown (10YR 5/4) SILT, little fine to medium subangular Sand, little Clay, aplastic, moderately dense, no odor, dry. | SILT |
| | 730 | 2 | 2-4 | 12<br>11<br>6<br>5 | 17 | 1.4 | 4.6 | + | SP | | Light brown-gray (10YR 6/2) fine to coarse subangular SAND, quartz-rich, aplastic, no odor, loose, dry. | SAND |
| | | | | | | | | | ML | | Black (10YR 2/1) SILT, little dark yellow-brown (10YR 4/6) fine to medium subangular SAND, trace Clay, aplastic, dense, no odor, dry. | SILT |
| 5 | | 3 | 4-6 | 1<br>2<br>4<br>7 | 6 | 1.2 | 11.8 | - | SP | | Yellow-brown (10YR 5/4) fine to coarse subrounded to subangular SAND, some to little Silt, little fine to coarse subrounded to subangular Gravel, density increasing with Silt content locally, weak odor, moderatly loose to dense, wet (saturated). | SAND |
| | 725 | 4 | 6-8 | 2<br>4<br>7<br>5 | 12 | 1.9 | 5.8 | - | CL | | Gray (10YR 6/1) CLAY, with yellow-brown (10YR 5/6) oxidation along fractures with mottling, little to some Silt, few to little fine to medium subangular to subrounded Sand, trace to few rounded Gravel, hard, no odor, dry. (pp > 4.5 tons/sq. feet). Clay Till. | CLAY |
| 10 | | 5 | 8-10 | 10<br>10<br>9<br>20 | 19 | 2.0 | 6.2 | - | | | CLAY, as above but homogeneous, dark gray (10YR 4/1) from 9.8' bgs downwards. Till. | |
| | 720 | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available
Step out of 2.5' from original due to obstruction at 4' bgs.
Samples collected 0.9-2' and 2-4' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/16/01 | 5.0' | NA |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/16/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 560396.21<br>**Easting:** 13305289.67<br>**Casing Elevation:** 731.97<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-44-05<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | FL | | CONCRETE. | Fill | Cement pad with 9" diam. flush-mount cover. |
| | | 1 | 0-2 | 6 6 7 | 12 | 1.1 | 1.5 | - | ML SP CL SP | | Yellow-brown (10 YR 5/6) aplastic SILT, few fine to medium subangular Sand, little Clay, moderately dense, no odor, dry. | | |
| | 730 | 2 | 2-4 | 4 4 6 7 | 10 | 1.3 | 1.2 | - | CL | | Dark yellow-brown (10YR 3/4) fine to coarse angular SAND, little fine to coarse subangular Gravel, little Silt, aplastic, loose, no odor, dry. | Clay | Grout 1-4' bgs. |
| | | | | | | | | | | | Light yellow-brown (10YR 6/4) CLAY, little Silt, little fine to medium subangular Sand, few fine to coarse subrounded Gravel, hard to very stiff, no odor, dry (pp = 3.5 to 4.0 tons/sq. feet). | | |
| | | | | | | | | | | | SAND, as at 1.1-1.5' bgs. | | |
| 5 | | 3 | 4-6 | 4 3 8 10 | 11 | 1.6 | 1.9 | - | | | Light yellow-brown (10YR 6/4) CLAY, little Silt, little fine to medium subangular Sand, few fine to coarse subrounded Gravel, hard to very stiff, no odor, dry with gray (10YR 5/1) fine to medium aplastic SAND from 11.3-11.5' bgs, some Silt, little Clay, trace fine to medium Gravel, moderately dense, moist. Gray-brown (10YR 6/1) with yellow-brown (10YR 5/4) local oxidation along fractures with pale brown (10YR 6/3) fracture salvages resulting in mottling, some Silt at 5' bgs. | | Bentonite holeplug 4-6' bgs. |
| | 725 | 4 | 6-8 | 6 10 23 15 | 33 | 2.0 | 2.2 | - | CL | | | | 2" ID Sch. 40 PVC riser 0.2-8' bgs. |
| | | 5 | 8-10 | 16 26 36 24 | 62 | 2.0 | 1.3 | - | | | 1-2" yellow-brown SILT lense, some Clay, aplastic, no odor, dense, damp at 6.5' bgs. | | |
| 10 | | 6 | 10-12 | 4 11 50/6 | - | 1.8 | 1.4 | - | | | Becomes homogeneous gray hard Clay, no oxidation/mottling. Clay Till. | | #5 Global filter sandpack 6-18' bgs. |
| | | | | | | | | | SP | | | | |
| | 720 | | | | | | | | CL | | | Clay | |
| | | 7 | 12-14 | 10 13 13 12 | 26 | 2.0 | 1.1 | - | ML | | SILT lense as at 11.3-11.5' bgs, wet, oxidized to brown, some fine to coarse angular Sand and Gravel. | Silt | 2" ID Sch. 40 PVC 0.010" slotted screen 8-18' bgs. |
| | | | | | | | | | CL | | Hard gray CLAY as at 9.8-11.3' bgs. | Clay | |
| 15 | | 8 | 14-16 | 11 29 35 39 | 64 | 1.9 | 3.4 | - | ML | | SILT as at 12.5-13.1' bgs, saturated, few fine to coarse rounded to subrounded Gravel. | Silt | |
| | | | | | | | | | | | Gray (10YR 5/1) subangular to subrounded fine to coarse SAND, some fine to coarse subangular to subrounded Gravel, little Silt, no odor, loose, wet. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
pp=pocket penetrometer
Samples collected 0.9-2', 2-4', 8-10' and 10-12' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/16/01 | 13.9' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-44-05

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 715 | 9 | 16-18 | 18<br>21<br>22<br>24 | 43 | 2.0 | 0.8 | - | ML | | SILT as at 12.5-13.1' bgs, saturated, few fine to coarse rounded to subrounded Gravel. | ← Silt → | 2" ID Sch. 40 PVC 0.010" slotted screen 8-18' bgs.<br>#5 Global filter sandpack 6-18' bgs. |
| 20 | 710 | | | | | | | | | | | | |
| 25 | 705 | | | | | | | | | | | | |
| 30 | 700 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
pp=pocket penetrometer
Samples collected 0.9-2', 2-4', 8-10' and 10-12' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/16/01 | 13.9' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 9/05/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-44-06<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-2 | 5, 20, 22, 28 | 42 | 1.6 | 11.7 | - | FL | | CONCRETE. | FILL | Borehole backfilled with Bentonite to grade. |
| | | | | | | | | | ML | | Dark yellow-brown (10YR 4/4) SILT, little Clay, little fine to coarse subrounded to subangular Sand, few fine to medium subrounded Gravel, aplastic, no odor, dense, dry. | | |
| | | 2 | 2-4 | 4, 8, 8, 6 | 16 | 1.8 | 8.3 | - | SM | | Yellow-brown (10YR 5/6) Silty fine to medium subangular SAND, few Clay, aplastic, no odor, moderately dense, dry. Occasional lenses of Silt up to 2" thick. | | |
| 5 | 5 | 3 | 4-6 | 8, 10, 13, 15 | 23 | 1.6 | 0.6 | - | | | | | |
| | | | | | | | | | ML | | Brown (10YR 4/3) SILT as at 1.3-2.0' bgs, aplastic. | | |
| | | 4 | 6-8 | 3, 7, 10, 12 | 17 | 1.7 | 0.0 | - | SP | | Pale brown (10YR 6/3) fine to medium subangular SAND, little Silt, trace fine to medium rounded Gravel, no odor, moderately dense, dry. | | |
| | | 5 | 8-10 | 7, 14, 17, 13 | 31 | 1.9 | 0.0 | - | CL | | Yellow-brown (10YR 5/4) Silty CLAY, little fine to medium subrounded to subangular Sand, trace fine to coarse subrounded to rounded Gravel, stiff, no odor, dry, heavily oxidized. Clay Till. Hard at 9' bgs. Wet at 10' bgs. | SILTY CLAY | |
| 10 | 10 | 6 | 10-12 | 10, 13, 20, 52 | 33 | 2.0 | 1.6 | - | | | at 7.5': homogenous gray (10YR 5/1). Occasionally Silt lenses up to 1" thick. | | |
| | | 7 | 12-14 | 5, 12, 19, 36 | 31 | 2.0 | 0.0 | - | | | | | |
| | | | | | | | | | ML | | Gray 10YR 5/1 SILT, some Clay, few fine subangular Sand, aplastic, no odor, dense, damp. Glacial Till. | SILT | |
| 15 | 15 | 8 | 14-16 | 12, 23, 32, 34 | 55 | 2.0 | 0.0 | - | | | Occasional fine to medium gray-brown (10YR 5/2) Silty Sand lenses, moist. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Set temporary well from 5' - 15' bgs.
bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1.3-3.3', 5.3-7.3' and 7.3-9.3' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 09/05/01 | 10.0' | |
| 09/12/01 | 14.5' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 9/05/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 2.7' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-44-07<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | NA | 0-0.7 | NA | NA | NA | NA | NA | FL | | ASPHALT | FILL | |
| | | 1 | 0.7-2.7 | 4<br>4<br>4<br>3 | 8 | 2.0 | 0.0 | - | ML | | Dark brown (10YR 3/3) SILT, little fine to coarse subrounded to rounded Sand, little Clay, trace fine rounded Gravel, aplastic, no odor, moderately dense, dry. Slag also present. Fill. | | Borehole backfilled with Bentonite to grade. |
| 5 | 5 | | | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0.7-2.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/21/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Chaperon<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 560396.29<br>**Easting:** 13305240.55<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 2.9' bgs<br>**Surface Elevation:** 732.22<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-44-09<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | | | | | | | | | | | | |
| 0 | | NA | NA | NA | NA | NA | NA | NA | FL | | Reinforced CONCRETE. | FILL | |
| | 730 | 1 | 0.9-2.9 | 6<br>7<br>7<br>7 | 14 | 1.8 | NA | NA | ML | | Yellow-brown (10YR 5/4) SILT, some subangular Gravel, few Clay, no odor, dense, aplastic, damp. Fill. | SILT | Borehole backfilled with Bentonite to grade. |
| 5 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Second attempt of boring installation.
bgs = below ground surface
Sample collected 0.9-2.9' bgs.
Initial boring installed on 9/5/01. Redrilled to collect additional sample.

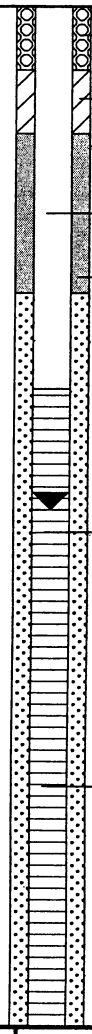
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 08/03/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 567143.10<br>**Easting:** 13306021.62<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 751.85<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-55-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | FL | | ASPHALT. | |
| | | | | | | | | | ML | | Dark gray-brown 10YR 4/2 SILT, some fine to coarse subrounded to subangular Sand, little Clay and coarse gravel- to pebble-sized angular large Gravel, aplastic, no odor, damp, moderately loose. Fill. | SILTY CLAY |
| | 750 | 1 | 1-3 | 2 2 3 4 | 5 | 1.5 | >10,000 | + | CL | | Gray (10YR 5/1) Silty CLAY, few fine to coarse subrounded Sand, extensive yellow-brown (10YR 5/4) mottling, no odor, damp, soft. Clay Till. | |
| | | 2 | 3-5 | 2 4 6 10 | 10 | 1.5 | >10,000 | - | | | Increasing stiffness with depth. Patches of localized heavy oxidation. | |
| 5 | | 3 | 5-7 | 3 4 5 5 | 9 | 1.5 | >10,000 | - | | | Silt lens 6.4-6.5' bgs, increasing moisture with depth. | |
| | 745 | 4 | 7-9 | 2 5 7 10 | 12 | 1.4 | >10,000 | - | ML | | Yellow-brown (10YR 5/6) SILT, some to little Clay, aplastic, no odor, saturated, moderately dense. | SILTY SAND |
| | | | | | | | | | SM | | Yellow-brown (10YR 5/6) Silty fine subangular to subrounded SAND, aplastic, no odor, saturated, moderately dense. | |
| 10 | | 5 | 9-11 | 3 5 6 7 | 11 | 1.3 | >10,000 | - | | | | |
| | 740 | 6 | 11-13 | 2 4 5 6 | 9 | 1.2 | 2,338 | - | | | Gray (10 YR 6/1), trace Clay. Glacial-alluvial. | |
| | | 7 | 13-15 | 3 3 3 5 | 6 | 1.6 | 3,475 | - | | | | |
| 15 | | 8 | 15-17 | 2 5 | 8 | NA | 4,869 | - | ML | | Gray (10YR 6/1) SILT, little fine subangular to subrounded Sand, few Clay, aplastic, no odor, saturated, moderately dense. Glacial-alluvial. | SILT |

**Boring Construction**



- Portland Cement 0 - 1' bgs
- Grout 1' - 2' bgs
- 2" ID PVC Sch. 40 PVC Riser 0 - 6' bgs
- Hydrated Bentonite Seal 2 - 4.5' bgs
- #5 Global Filter Sand 4.5 - 17' bgs
- 2" ID Sch 40 0.010" Slot PVC Screen 6' - 16' bgs

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
+ = Positive Test Result
Samples collected 1-3' and 5-7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/03/01 | 7.9' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-55-01

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | 8 | 15-17 | 3<br>4 | 8 | NA | 4,869 | - | ML | | Gray (10YR 6/1) SILT, little fine subangular to subrounded Sand, few Clay, aplastic, no odor, saturated, moderately dense. Glacial-alluvial. | SILT | PVC Cap<br>#5 Global Filter Sand 4.5' - 17' bgs |
| 20 | 730 | | | | | | | | | | | | |
| 25 | 725 | | | | | | | | | | | | |
| 30 | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
+ = Positive Test Result
Samples collected 1-3' and 5-7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/03/01 | 7.9' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 08/03/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 567143.10<br>**Easting:** 13306021.62<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 38' bgs<br>**Surface Elevation:** 751.85<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-55-01Geotech<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | | | See RFI-55-01 for stratigraphic description 0-17' bgs. | | |
| 5 | 5 | | | | | | | | | | | | Borehole backfilled with bentonite to grade. |
| | | | | | | | | | | | Shelby tube collected. | | |
| 10 | 10 | | | | | | | | | | Unable to keep sand in tube - no recovery. (heaving sands) | | |
| | | 1 | 12.5-1 | 2<br>4<br>5<br>4 | 9 | 1.8 | 0.0 | NA | | | Split spoon sample collected. | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA=Not Available/Applicable. See RFI-55-01 for descriptions.
Geotech samples collected 8.5-10.5', 12.5-14.5', 35-36' and and 36-37' bgs

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/3/01 | 33.5' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-55-01Geotech

**Borehole Depth:** 38' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | See RFI-55-01 for stratigraphic description 0-17' bgs. | |
| | | | | | | | | | ML | | Gray (10 YR 6/1) SILT, little to few fine subangular to subrounded Sand, little Clay with increasing clay content with depth, aplastic, moderately dense to dense, no odor, saturated. Glacial-alluvial. | SILT |
| 20 | 20 | 2 | 19-21 | 2 3 2 3 | 5 | 1.8 | NA | NA | | | | |
| | | 3 | 23-25 | 2 3 3 3 | 6 | 2.0 | NA | NA | CL | | Gray (10 YR 6/1) Silty CLAY, few to little fine to medium subangular to subrounded Sand, trace rounded fine to medium Gravel, soft, no odor, damp. Local saturated silt and/or silty sand lenses up to 2.5" thick throughout. Increasing stiffness and decreasing moisture with depth to lower contact. Till. | SILTY CLAY |
| 25 | 25 | | | | | | | | | | | |
| | | 4 | 28-30 | 3 4 5 5 | 9 | 2.0 | NA | NA | | | | |
| 30 | 30 | 5 | 30-32 | WO 3 6 6 | 9 | 2.0 | NA | NA | | | 30-31': Gray (10 YR 6/1) SILT as at 17-23.5' bgs. | |
| | | 6 | 32-34 | 2 4 6 9 | 10 | 2.0 | NA | NA | | | 32.7-33.5': SILT as above. | |
| | | | | | | | | | SP | | Gray (10 YR 5/1) fine to coarse rounded to subrounded SAND, some to little Silt, little fine to medium subrounded to rounded Gravel, trace Clay, no odor, saturated, loose. Alluvial/riverine sand and gravel. | SAND |
| 35 | 35 | 7 | 34-36 | 54 67/ 5" | NA | 1.2 | NA | NA | CL | | Gray (10 YR 5/1) Silty CLAY as at 23.5-33.5, dry, hard. Till. | silty clay |

**Boring Construction**

Borehole backfilled with bentonite to grade.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA=Not Available/Applicable. See RFI-55-01 for descriptions.
Geotech samples collected 8.5-10.5', 12.5-14.5', 35-36' and and 36-37' bgs

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/3/01 | 33.5' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-55-01Geotech

**Borehole Depth:** 38' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 36-38 | 32 50/ 5" | NA | 0.1 | NA | NA | CL | | Gray (10 YR 5/1) Silty CLAY as at 23.5-33.5, dry, hard. Till. At 36', Shelby Tube attempted - only 2" recovered, used split-spoon sample. | SILTY CLAY | Borehole backfilled with bentonite to grade. |
| 40 | 40 | | | | | | | | | | | | |
| 45 | 45 | | | | | | | | | | | | |
| 50 | 50 | | | | | | | | | | | | |
| 55 | 55 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

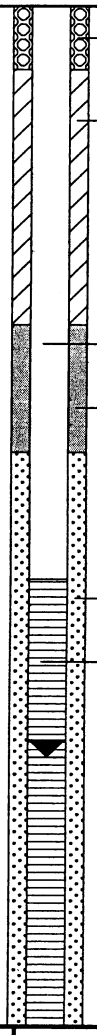
**Remarks:** bgs = below ground surface;
NA=Not Available/Applicable. See RFI-55-01 for descriptions.
Geotech samples collected 8.5-10.5', 12.5-14.5', 35-36' and and 36-37' bgs

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/3/01 | 33.5' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/27/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 566939.37<br>**Easting:** 13306185.99<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** 752.88<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-55-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | | |
| 0 | | | | | | | | | FL | | ASPHALT | FILL |
| | | | | | | | | | GP | | Coarse angular aggregate GRAVEL and black (10YR 2/1) Silty fine to coarse subrounded to subangular SAND, trace Clay; no odor, loose, damp. Foundry Sand mixed with aggregate Fill. | |
| | | 1 | 1-3 | 4<br>7<br>7<br>10 | 14 | 1.7 | >10,000 | - | CL | | Yellow-brown (10YR 5/4) Silty CLAY, little fine to medium subangular to subrounded Sand, trace rounded fine to medium Gravel, soft, no odor, damp to dry. Clay Till. | |
| | 750 | | | | | | | | | | Black (10YR 2/1) Silty SAND as at 0.5-1' bgs, but no gravel aggregate. Foundry sand. | |
| 5 | | | HSA | NA | NA | NA | NA | NA | SM | | | SILTY SAND |
| | 745 | 2 | 8-10 | 3<br>5<br>8<br>8 | 13 | 2.0 | >10,000 | - | CL | | Yellow-brown Silty CLAY as at 1-1.5' bgs, but very stiff, damp. | |
| 10 | | 3 | 10-12 | 4<br>5<br>6<br>7 | 11 | 11 | >10,000 | - | SM | | Yellow-brown (10YR 5/6) Silty fine subangular to subrounded SAND, few Clay, no odor, moist, moderately loose to moderately dense. | SILTY SAND |
| | 740 | | | | | | | | | | | |
| 15 | | | HSA | NA | NA | NA | NA | NA | | | | |




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3' and 8-10' bgs.
- = Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/27/01 | 11.8' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-55-02

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | | HSA | NA | NA | NA | NA | NA | ML | | Gray (10 YR 5/1) SILT with fine subangular to subrounded Sand, saturated. Glacial-alluvial. | SILT | Global #5 sandpack 7-20' bgs. 2" ID Sch. 40 PVC 0.010" slotted screen 9-19' bgs. |
| 20 | | | | | | | | | | | | | |
| | 730 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3' and 8-10' bgs.
- = Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/27/01 | 11.8' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/26/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Alan Rau<br>**Drilling Method:** Hand Auger<br>**Sampler Size:** NA<br>**Auger Size:** 3" ID<br>**Rig Type:** NA | **Northing:** 566904.45<br>**Easting:** 13306083.8<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 3' bgs<br>**Surface Elevation:** 753.52<br><br>**Descriptions By:** S. Duly | **Boring ID:** RFI-55-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | |
| 0 | | 1 | 0-3 | 3.0 | >10000 | - | ML | | Gray-brown 10YR 5/2 SILT, some to little fine to medium subangular to subrounded Sand, trace to few Clay, aplastic, no odor, loose, dry. Vegetation and Roots present, Topsoil mixed with large angular Gravel Fill.<br>Black 10YR 2/1 SILT, some fine subangular to subrounded Sand, loose, dry, no odor, aplastic. Fill/Foundry Silt/Sand.<br>Yellow-brown 10YR 5/4 SILT, few Clay, aplastic, moderately dense, damp, no odor. Fill. | SILT | Borehole backfilled with Bentonite Pellets. |
| | 750 | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| | 745 | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| | 740 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Obstruction encountered at 3.0' bgs.
Sample collected 0-2' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/26/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Alan Rau<br>**Drilling Method:** Hand Auger<br>**Sampler Size:** NA<br>**Auger Size:** 3" ID<br>**Rig Type:** NA | **Northing:** 567044.75<br>**Easting:** 13305963.59<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** 753.59<br><br>**Descriptions By:** S. Duly | **Boring ID:** RFI-55-04<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | |
| 0 | | | | | | | FL | | Coarse angular Gravel. Fill. | | |
| | | 1 | 0-2 | 2.0 | >10000 | - | | | Black (10YR 2/1) SILT, few to little fine subangular to subrounded Sand, trace to few Clay, aplastic, no odor, loose, dry. Foundry Fill. | | |
| | 750 | 2 | 2-4 | 2.0 | NA | NA | | | | | Borehole backfilled with Bentonite Pellets. |
| 5 | | 3 | 4-6 | 2.0 | NA | NA | ML | | | SILT | |
| | | 4 | 6-8 | 2.0 | 0.0 | - | | | Brown (10YR 3/3) SILT, some Clay, little fine to medium subangular to subrounded Sand, trace fine rounded Gravel, aplastic, no odor, moderately dense, damp. Till. | | |
| | 745 | 5 | 8-10 | 2.0 | NA | NA | | | Saturated. | | |
| 10 | | | | | | | | | | | |
| | 740 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0-2' and 6-8' bgs.
- = Negative Test Result

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/26/01 | 8.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/26/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Alan Rau<br>**Drilling Method:** Hand Auger<br>**Sampler Size:** NA<br>**Auger Size:** 3" ID<br>**Rig Type:** NA | **Northing:** 566820.33<br>**Easting:** 13305734.56<br>**Casing Elevation:** 753.94<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** 753.99<br><br>**Descriptions By:** S. Duly | **Boring ID:** RFI-55-05<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | |
| 0 | | 1 | 0-2 | 2.0 | >10000 | - | SM | | Subangular to subrounded fine Silty SAND, predominately FILL SAND, trace Clay, aplastic, few organic matter such as Roots present, no odor, loose, damp to dry. | SAND | Borehole backfilled with Bentonite Pellets. |
| | | 2 | 2-4 | 2.0 | NA | NA | | | | | |
| | 750 | | | | | | | | | | |
| 5 | | 3 | 4-6 | 2.0 | NA | NA | CL | | Dark brown (10YR) Silty CLAY, little to few fine to medium subangular to subrounded Sand, trace to few fine to medium subrounded to rounded Gravel, soft to medium stiff, moderately plastic, no odor, damp to dry. Clay Till.<br>at 4.5': mixed with slag and metallic debris. | SILTY CLAY | |
| | | 4 | 6-8 | 2.0 | >10000 | NA | | | | | |
| | 745 | 5 | 8-10 | 2.0 | NA | - | ML | | Black (10YR 2/1) SILT, little fine to medium subrounded to subangular Sand, trace to little Clay, aplastic, no odor, moderately loose to moderately dense, damp. | SILT | |
| 10 | | | | | | | | | | | |
| | 740 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0-2' and 8-10' bgs.
- = Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/26/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Alan Rau<br>**Drilling Method:** Hand Auger<br>**Sampler Size:** NA<br>**Auger Size:** 3" ID<br>**Rig Type:** NA | **Northing:** 566873.02<br>**Easting:** 13305900.09<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 3.5' bgs<br>**Surface Elevation:** 753.91<br><br>**Descriptions By:** S. Duly | **Boring ID:** RFI-55-06<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | |
| 0 | | 1 | 0-3.5 | 3.5 | >10000 | - | SM | | Brown 10YR 3/3 SILTY SAND, fine subangular to subrounded Sand, few fine to medium subrounded to rounded Gravel, some coarse grained angular Gravel (Fill), no odor, dry, loose, Organic Matter such as Roots present. Topsoil mixed with Fill. | SILTY SAND | Borehole backfilled with Bentonite Pellets. |
| | | | | | | | CL | | Yellow-brown 10YR 5/6 Silty CLAY, little fine to medium subangular to subrounded Sand, trace fine to medium rounded Gravel, no odor, soft to medium stiff, damp to dry. Native Clay Till used as Backfill, Glass and metalic debris also present. | SILTY CLAY | |
| | 750 | | | | | | | | at 3.5': pipe with fill sand on top. | | |
| 5 | | | | | | | | | | | |
| | 745 | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| | 740 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Sample collected 0-2' bgs.
- = Negative Test Result.

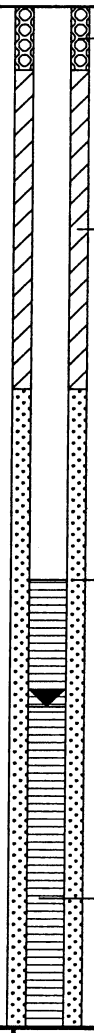
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/27/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2"x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 566762.73<br>**Easting:** 13305786.95<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 21' bgs<br>**Surface Elevation:** 753.75<br><br>**Descriptions By:** SM Dully | **Boring ID:** RFI-55-09<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 7, 10, 8, 8 | 18 | 1.0 | 1334 | - | GP | | Coarse angular fossilferous limestone GRAVEL and PEBBLES, no odor, dry, loose. Fill. | GRAVEL |
| | | 2 | 2-4 | 6, 6, 5, 6 | 11 | 2.0 | >9999 | - | ML | | Dark gray brown (10YR 3/2) aplastic SILT, little fine to coarse subangular Sand and fine to coarse subangular predominantly limestone Gravel, no odor, dry, loose to moderate dense (former topsoil mixed with fill). | SILT |
| | 750 | | | | | | | | SM | | Yellow brown (10YR 5/6) Silty SAND, fine subangular Sand, trace to no Clay, no odor, damp, moderate dense. Fill. | SILTY SAND |
| 5 | | 3 | 4-6 | 3, 4, 5, 5 | 9 | 2.0 | 3085 | - | CL | | Dark yellow brown (10YR 4/6) Silty CLAY to CLAY with some Silt, little fine to medium subangular to subrounded Sand, trace fine to medium subrounded Gravel, no odor, moist, soft to moderate stiff. | CLAY and SILT |
| | | 4 | 6-8 | 3, 2, 3, 5 | 5 | 1.7 | 1287 | - | ML | | Yellow brown (10YR 5/4) aplastic SILT, some to little Clay, little fine to medium subangular to subrounded Sand, trace fine to medium rounded Gravel, damp, dense, no odor, local patches of increased clay content to Silty CLAY, water at 4.6'-5.1' bgs. | |
| | | | | | | | | | CL | | Dark yellow brown Silty CLAY to CLAY with some Silt, moist at 8' bgs, locally oxidized to yellow brown (10YR-5/8). | |
| | 745 | 5 | 8-10 | 2, 3, 2, 3 | 5 | 2.0 | 1205 | - | SM | | Dark yellow brown (10YR 4/6 to 5/6) Silty SAND, few Clay, fine subangular Sand, no odor, damp to moist, moderate dense to dense. At 11' bgs with increased coarseness, decreased Silt, fine to medium Sand (predominantly fine subangualr Sand). | SILTY SAND |
| 10 | | 6 | 10-12 | 3, 4, 5, 6 | 9 | 1.5 | 284 | - | | | | |
| | | 7 | 12-14 | 2, 2, 3, 3 | 5 | 2.0 | 1281 | - | | | | |
| | 740 | 8 | 14-16 | 2, 2, 3, 7 | 5 | 1.6 | 526 | - | ML | | Gray (10YR 5/1) aplastic SILT, some fine subangular Sand, trace to no Clay, no odor, saturated, moderate dense. Alluvial. | SILT |
| 15 | | | | | | | | | SM | | Gray (10YR 5/1) aplastic Silty SAND, fine subangular Sand, no odor, saturated, moderate dense to moderate loose (alluvial or river sands). From 18.5'-19.0' bgs: decreased | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3' and 9-11' bgs.
- = Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/27/01 | 11' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-55-09

**Borehole Depth:** 21' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 3 3 5 6 | 8 | NA | 227 | - | SM | | sand and increased silt to Silt with SAND. From 19.0' bgs with increased sand and decreased silt to Silty SAND. | SILTY SAND | Screen 9'-19' bgs; Sand pack 6'-19' bgs |
| | 735 | 10 | 18-20 | NA | NA | NA | 434 | - | | | | | |
| 20 | | 11 | 20-21 | NA | NA | NA | NA | - | | | | | |
| | 730 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3' and 9-11' bgs.
- = Negative Test Result.

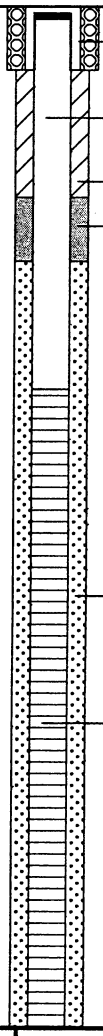
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/27/01 | 11' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/23/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4-1/4" ID<br>**Rig Type:** CME 55 ATV | **Northing:** 566762.73<br>**Easting:** 13305786.95<br>**Casing Elevation:** 753.75<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 754.10<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-55-10<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-2 | 4 8 9 11 | 17 | 1.6 | 0.0 | - | | | ASPHALT. | FILL |
| | | | | | | | | | | | Coarse grained angular Pebbles, aggregate. | |
| | | | | | | | | | SM | | Very dark brown (10YR 2/2) fine subrounded to subangular poorly sorted Silty SAND, little Clay, no odor, damp, dense, local patches of oxidation to dark red-brown Foundry Sand. | SILTY SAND |
| | | 2 | 2-4 | 9 11 12 13 | 23 | 1.0 | 0.0 | - | | | Moist to wet. | |
| 5 | 5 | 3 | 4-6 | 2 3 5 8 | 8 | 1.6 | 0.0 | - | ML | | Dark gray (10YR 4/1) SILT, little fine subrounded to subangular Sand and Clay, no odor, dense, moist. Becomes brown (10YR 4/3), increased Clay content to some, increased coarseness of Sand to fine to coarse. | SILT |
| | | 4 | 6-8 | 3 7 9 9 | 16 | 1.1 | 0.0 | - | SP | | Gray-brown (10YR 5/2) fine to coarse subrounded to subangular poorly graded SAND, some Silt, few Clay, no odor, damp, dense, Fill Sand. Some fine to medium subangular to angular Gravel. | SAND |
| | | 5 | 8-10 | 3 5 7 8 | 12 | 1.4 | 0.0 | - | | | Becomes moist, decreased Silt to little. | |
| 10 | 10 | 6 | 10-12 | 3 6 8 9 | 14 | 1.0 | 0.0 | - | | | Saturated. | |
| | | 7 | 12-14 | 4 5 6 7 | 11 | 1.8 | 0.0 | - | | | Fining downwards, Glacio-alluvial. | |
| 15 | 15 | 8 | 14-16 | 2 3 4 7 | 7 | 1.3 | 0.0 | - | ML | | Brown (10YR 5/3) SILT, little fine subrounded to subangular Sand, few Clay, no odor, saturated, dense, aplastic, Glacio-alluvial. | SILT |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3' and 7-9' bgs.
- = Negative Test Result

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/23/02 | 9.9' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-55-10

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | ML | | Brown (10YR 5/3) SILT, little fine subrounded to subangular Sand, few Clay, no odor, saturated, dense, aplastic, Glacio-alluvial. | SILT | Global Filter Sand 4-17' bgs; PVC Cap |
| 20 | 20 | | | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

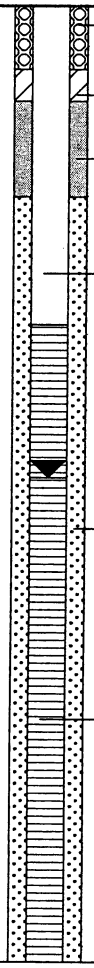
**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1-3' and 7-9' bgs.
- = Negative Test Result

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/23/02 | 9.9' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/27/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID HSA<br>**Rig Type:** CME 45B | **Northing:** 564791.64<br>**Easting:** 13305423.84<br>**Casing Elevation:** 742.82<br><br>**Borehole Depth:** 15' bgs<br>**Surface Elevation:** 743.32<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-65-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | |
| 0 | | | | | | | | | FL | | CONCRETE. | |
| | | 1 | 1-3 | 12 17 10 11 | 27 | 1.3 | 0.0 | - | SP | | Dark yellowish-brown (10 YR 4/6) fine to coarse SAND, little Silt, trace Clay, trace coarse Gravel, aplastic, loose, no odor, damp. Fill | SAND |
| | 740 | | | | | | | | ML | | Very dark brown (10 YR 2/2) SILT, little fine Sand, trace Clay, dense, no odor, damp. Fill | SILT |
| | | 2 | 3-5 | 8 10 12 16 | 22 | 1.6 | 0.0 | - | SM | | Yellowish-brown (10 YR 5/8) fine SAND, some Silt, trace Clay, moderately loose, damp.<br>Moist. | SAND |
| 5 | | 3 | 5-7 | 4 8 8 9 | 16 | 1.6 | 0.0 | - | | | Wet. | |
| | 735 | 4 | 7-9 | 7 7 9 12 | 16 | 1.6 | 1.3 | - | | | Saturated. | |
| 10 | | 5 | 9-11 | 7 7 9 10 | 16 | 1.3 | 0.0 | - | ML | | Increased Silt to a Sandy SILT. | SANDY SILT |
| | | | | | | | | | | | Gray (10 YR 6/1) SILT, dense, no odor, saturated. | |
| | | 6 | 11-13 | 4 2 3 3 | 5 | 1.7 | 0.0 | NA | CL | | Gray (10 YR 5/1) CLAY, trace Silt, silt seams up to 3" wide, soft, highly plastic, no odor, saturated. | CLAY |
| | 730 | 7 | 13-15 | 2 1 2 4 | 3 | 2.0 | 0.0 | NA | | | | |
| 15 | | | | | | | | | | | | |




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0.7-2.7' and 4.7-6.7' bgs.
- = Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/27/01 | 7.4' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 8/5/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3'/4" ID<br>**Rig Type:** CME 55 | **Northing:** 564409.43<br>**Easting:** 13305813.97<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 7.5<br>**Surface Elevation:** 746.17<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | NA | NA | NA | NA | NA | NA | - | FL | | Concrete (reinforced). | FILL | |
| | | 1 | 2.5-4.5 | 6<br>11<br>9<br>10 | 20 | 1.6 | 0.0 | - | ML | | Black (10YR 2/1) SILT, little fine subangular Sand, few Clay, trace fine to medium subrounded Gravel, metallic Debris and Slag present, aplastic, no odor, dry, moderately dense. | SILT | Borehole backfilled with Bentonite to grade. |
| | | NA | NA | NA | NA | NA | NA | - | | | | | |
| 5 | 740 | 2 | 5-7 | 4<br>7<br>9<br>9 | 16 | 1.5 | 0.0 | - | | | | | |
| | | NA | NA | NA | NA | NA | NA | - | | | | | |
| | | | | | | | | | | | End of boring--obstruction. Unknown obstruction: possibly a pipe or concrete. | | |
| 10 | 735 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 2.5-4.5' bgs.
- = Negative Test Result.

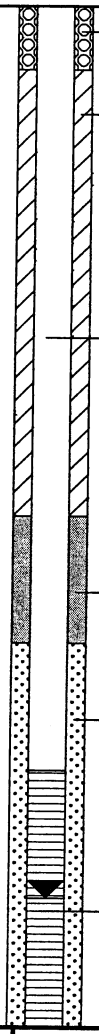
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 09/09/01<br>**Drilling Company:** Rau Drillling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA - split spoon w/shive<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 564271.5<br>**Easting:** 13305806.91<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 22'<br>**Surface Elevation:** 745.92<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | | | | | | | FILL | | CONCRETE | FILL |
| 5 | 740 | 1 | 4-6 | 3<br>10<br>10<br>50/<br>5" | 20 | 1.7 | 0.0 | - | ML | | Black (10 YR 2/1) SILT, little Clay, little fine to coarse subangular to subrounded Sand, trace fine to medium subrounded Gravel, aplastic, no odor, dry, dense. Mixed with gray slag. Backfill. | SILT |
| | | 2 | 6-8 | 27<br>50/<br>2" | NA | 0.3 | 0.0 | - | | | Rubbly drilling - steel/metallic debris present. | |
| 10 | 735 | 3 | 8-10 | 6<br>10<br>19<br>20 | 29 | 0.8 | 0.0 | + | | | | |
| | | 4 | 10-12 | 7<br>29<br>30<br>11 | 59 | 1.9 | 0.0 | + | | | | |
| 15 | 730 | 5 | 12-14 | 5<br>14<br>12<br>14 | 26 | 1.3 | NA | - | | | Yellow-brown (10 YR 5/4) SILT, little Clay, aplastic, no odor, dense, damp. | |
| | | 6 | 14-16 | 4<br>7<br>11<br>15 | 18 | NA | NA | - | | | Little fine subangular Sand, saturated. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available
Samples collected 4-6', 8-10', and 12-14' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 09/09/01 | 14' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-81-02

**Borehole Depth:** 22'

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 16-22 | NA | NA | NA | NA | NA | ML | | Yellow-brown (10 YR 5/4) SILT, little Clay, little fine subangular Sand, aplastic, no odor, dense, damp. | SILT | 2" ID Sch. 40 PVC 0.010" slotted screen 12-22' bgs. Global #5 sand pack 10-22' bgs. |
| 20 | 725 | | | | | | | | | | | | |
| 25 | 720 | | | | | | | | | | | | |
| 30 | 715 | | | | | | | | | | | | |
| 35 | 710 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available
Samples collected 4-6', 8-10', and 12-14' bgs.

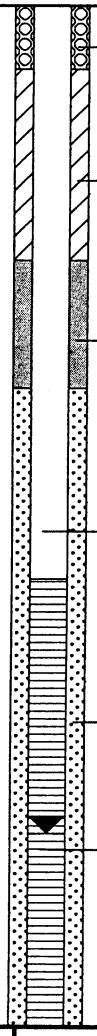
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 09/09/01 | 14' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/21/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" 10 HSA<br>**Rig Type:** CME 45B | **Northing:** 564182.56<br>**Easting:** 13306289.85<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 22' bgs<br>**Surface Elevation:** 745.7<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-81-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | 1 | 0-2 | 4 5 7 5 | 12 | 1.6 | 28.2 | - | ML | | Brown (10 YR 4/3) aplastic SILT, little fine to medium subrounded Sand, little to some Clay, earthy odor, damp, moderately loose. Vegetation and organic matter (roots) present. Top soil. | SILT |
| | | 2 | 2-4 | 7 14 16 22 | 30 | 1 | 123 | - | SP | | Black (10 YR 2/1) to dark brown (10 YR 3/1) fine to coarse aplastic SAND, some Silt, no odor, damp, dense. Fill foundary sand with slag. At 3.0' bgs, little Clay. | SAND |
| 5 | 740 | 3 | 4-6 | 5 8 11 13 | 19 | 1.7 | 106 | - | | | Black (10 YR 2/1) to dark brown (10 YR3/1) aplastic SILT, some fine to coarse subrounded to subangular Sand, no odor, dense, damp, local oxidation and mottling to dark yellow brown ( 10 YR 4/6) , lenses of black fine to coarse sand to gravel size fragments of slag. Fill foundary Sand and slag. At 7.0'bgs, occurence of clay lenses up to 1" in width thoughout. | SILT |
| | | 4 | 6-8 | 6 8 10 6 | 18 | 1.2 | 157 | - | ML | | | |
| | | 5 | 8-10 | 7 22 22 9 | 44 | 1.9 | 321 | - | | | | |
| 10 | 735 | 6 | 10-12 | 7 10 5 6 | 15 | 1.6 | 107 | - | SP | | Yellow brown (10 YR 5/6) with dark gray brown (10 YR 3/2) to brown (10 YR 2/1) aplastic fine to medium SAND, some Silt, no odor, damp to locally moist, dense, slag still present. Foundary/Fill Sand. | SAND |
| | | 7 | 12-14 | 11 26 30 11 | 56 | 2 | 903 | - | | | Fine to medium gravel size aplastic SLAG, no odor, moist, dense to very dense. | GRAVEL |
| 15 | 730 | 8 | 14-16 | 4 3 3 4 | 6 | 1.2 | 83.0 | + | ML | | Brown aplastic SILT, little to some fine to medium Sand, little to some Clay, weak hydrocarbon-like odor, saturated, dense to locally very dense. | SILT |
| | | | | | | | | | CL | | Gray (10 YR 5/1) SILTY CLAY, some to little fine to medium Sand, no odor, saturated, soft to very soft, local lenses of Silt up to 1" wide throughout. | CLAY |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
+/- = Positive/Negative Test Result.
Samples collected 0-2', 8-10' and 10-12' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/21/01 | 13.0' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-81-03

**Borehole Depth:** 22' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 7, 13, 18, 24 | 31 | 1.8 | 77.1 | - | CL | | Gray (10 YR 5/1) SILTY CLAY, some to little fine to medium Sand, no odor, saturated, soft to very soft, local lenses of Silt up to 1" wide throughout. | CLAY | |
| | | 10 | 18-20 | 10, 22, 24, 16 | 46 | 2 | 65.7 | - | | | Gray (10 YR 6/1) CLAY, some Silt, little fine to medium subrounded Sand, trace fine to medium subangular to subrounded Gravel, no odor, dry, hard. Extensively bleached to 10 YR 8/1) throughout and oxidized to yellow brown (10 YR 5/4). Clay Till. | | 2" ID Sch. 40 PVC 0.010" slotted screen 9-19' bgs. |
| 20 | 725 | 11 | 20-22 | 3, 2, 8, 11 | 15 | 2 | 48.2 | - | | | Damp and very stiff. | | #5 Global filter sandpack 6-22' bgs. |
| 25 | 720 | | | | | | | | | | | | |
| 30 | 715 | | | | | | | | | | | | |
| 35 | 710 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
+/- = Positive/Negative Test Result.
Samples collected 0-2', 8-10' and 10-12' bgs.

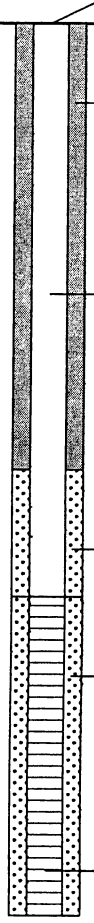
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/21/01 | 13.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/25/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Bit Size:**<br>**Auger Size:**<br>**Rig Type:** Geoprobe 66 DT Track Rig<br>**Sampling Method:** 2" diam. + disposable liner<br>**Hammer Weight:** | **Northing:** 564801.44<br>**Easting:** 13306136.75<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 745.83<br><br>**Geologist:** Shawn Kerr | **Well/Boring ID:** RFI-81-04<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | 1 | 0-1 | - | NA | NA | | | CONCRETE. |
| | | 2 | 1-2 | 0.0 | NA | NA | | | No Recovery. |
| | | 3 | 2-4 | 0.3 | NA | NA | | | |
| 5 | 740 | 4 | 4-6 | 1.3 | NA | NA | | | Dark gray-black fine to medium SAND with small to large rounded and angular GRAVEL.<br>Brown fine SAND.<br>Black fine SAND with large angular Rock. |
| | | 5 | 6-8 | 1.1 | NA | NA | | | Brown fine to medium SAND, black staining at 6.4' and 6.9' bgs. |
| | | 6 | 8-10 | 1.0 | NA | NA | ✸ | | Brown medium to coarse SAND and GRAVEL.<br>Black foundry SAND with Slag. |
| 10 | 735 | 7 | 10-12 | 1.2 | NA | NA | | | Black SAND, FILL material, and Metal Chunks. Saturated at 10.4' bgs. |
| | | 8 | 12-14 | 1.5 | NA | NA | | | Dark gray-black Sandy CLAY.<br>Gray fine SAND, trace Clay, angular Gravel. |
| 15 | 730 | 9 | 14-16 | 2.0 | NA | NA | | | Brownish-gray CLAY, stiff. |

Well/Boring Construction




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Sample collected 8-10' bgs.
PID not functional.
Sample collected 8-10' bgs.

| | | |
|---|---|---|
| **Date Start/Finish:** 8/4/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2"<br>**Auger Size:** 3 1/4" ID HSA<br>**Rig Type:** CME 55 | **Northing:** 564503.21<br>**Easting:** 13306079.71<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 746.08<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-05<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | | | | | | | FILL | | Concrete. | FILL | |
| | | | | | | | | | | | Void. | | |
| | | | | | | | | | | | Concrete. | FILL | |
| | | 1 | 3-5 | 3 5 6 7 | 11 | 2.0 | >10,000 | - | SW | | Black (10 YR 2/1) fine subangular SAND, some Silt, no odor, moderately loose, dry. Foundry sand. Fill. | SAND | Borehole backfilled with bentonite to grade. |
| 5 | 740 | 2 | 5-7 | 4 4 6 2 | 10 | 1.0 | >10,000 | - | | | Becomes very dark gray (10 YR 3/1) mixed with medium to coarse angular gravel-sized pieces of concrete and gravel. | | |
| | | 3 | 7-9 | 2 2 3 2 | 5 | 2.0 | >10,000 | - | | | Black (10 YR 2/1) damp, with increased moisture with depth. | | |
| 10 | 735 | 4 | 9-11 | 2 3 3 2 | 6 | 2.0 | >10,000 | - | | | Moist, few clay. | | |
| | | 5 | 11-13 | 1 2 3 3 | 5 | 1.8 | >10,000 | - | | | Saturated. | | |
| | | 6 | 13-15 | 3 5 4 3 | 9 | 1.2 | >10,000 | NA | | | | | |
| 15 | | 7 | 15-17 | 1 3 | 7 | 1.8 | 9978 | NA | CL | | Dark gray (10 YR 4/1) Silty CLAY, little fine to medium subangular to subrounded Sand, trace fine to medium rounded Gravel, soft, no odor, damp. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA=Not Available/Not Applicable.
Refusal at 4', 1st attempt. Boring/Temporary Well relocated.
Samples collected 3-5' and 9-11' bgs.
Set temporary well screen at 10-15' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-81-05

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | 7 | 15-17 | 4<br>5 | 7 | 1.8 | 9978 | NA | CL | | Gray (10 YR 5/1) Silty CLAY, little fine to medium subangular to subrounded Sand, trace fine to medium rounded Gravel, very stiff, no odor, damp. | LTY CL | Borehole backfilled with bentonite to grade. |
| 20 | 725 | | | | | | | | | | | | |
| 25 | 720 | | | | | | | | | | | | |
| 30 | 715 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA=Not Available/Not Applicable.
Refusal at 4', 1st attempt. Boring/Temporary Well relocated.
Samples collected 3-5' and 9-11' bgs.
Set temporary well screen at 10-15' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 8/4/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 564069.09<br>**Easting:** 13306188.66<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 745.74<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-06<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | 1 | 0-2 | - 5 6 7 | 11 | 1.2 | 1177 | - | FILL | | Concrete. | FILL | |
| | | | | | | | | | SM | | Yellow-brown (10 YR 5/6) Silty fine to coarse subangular to subrounded SAND, trace Clay, few fine to coarse subrounded to rounded Gravel, no odor, moderately dense. Fill. | SILTY SAND | |
| | | 2 | 2-4 | 7 14 14 19 | 28 | 1.0 | >10,000 | - | | | Becomes black (10 YR 2/1) and damp, no gravel. | | |
| 5 | 740 | 3 | 4-6 | 10 6 3 2 | 9 | 1.0 | 4228 | - | | | Becoming loose, damp, sand is predominantly fine grained. Foundry sand/Fill. | | Borehole backfilled with bentonite to grade. |
| | | 4 | 6-8 | 3 3 3 4 | 6 | 1.2 | 9194 | - | | | | | |
| | | 5 | 8-10 | 2 3 2 3 | 5 | 1.5 | 1073 | - | | | Moist. | | |
| 10 | 735 | 6 | 10-12 | 5 5 5 6 | 10 | 1.6 | 662 | - | | | Yellow-brown (10 YR 5/6) mottling, fine to medium Silty SAND. | | |
| | | 7 | 12-14 | 4 4 3 3 | 7 | 1.7 | 60.2 | - | | | Moderately dense. | | |
| | | | | | | | | | | | 1" wide yellow-brown (10 YR 5/6) lens, otherwise black. | | |
| | | | | | | | | | | | 1" wide yellow-brown (10 YR 5/6) lens, otherwise black. | | |
| 15 | 730 | 8 | 14-16 | 3 5 6 7 | 11 | 1.2 | 0.0 | - | | | Saturated at 16.1' bgs. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; - = Negative Test Resul
NA = Not Applicable/Not Available
Set temporary well screen 7-17' bgs.
Samples collected 0.8-2.8', 2.8-4.8', 8.8-10.8' and 12.8-14'

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-81-06

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 3 4 4 6 | 8 | 2.0 | 0.0 | - | CL | | Gray (10 YR 5/1) Silty CLAY, little fine to medium subangular to subrounded Sand, very stiff to hard (pp=4 tons/sq. ft.), no odor, dry. Clay Till. | SILTY CLAY | Borehole backfilled with bentonite to grade. |
| 20 | 725 | | | | | | | | | | | | |
| 25 | 720 | | | | | | | | | | | | |
| 30 | 715 | | | | | | | | | | | | |
| 35 | 710 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; - = Negative Test Result
NA = Not Applicable/Not Available
Set temporary well screen 7-17' bgs.
Samples collected 0.8-2.8', 2.8-4.8', 8.8-10.8' and 12.8-14'

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/27/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 45B | **Northing:** 563842.42<br>**Easting:** 13306209.01<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** 741.31<br><br>**Descriptions By:** S Kerr | **Boring ID:** RFI-81-07<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | Fill | | Asphalt. | | |
| | | | | - | | | | | SW | | Yellow brown (10 Y 5/4) aplastic fine SAND, loose, damp, no odor. Fill. | | |
| | 740 | 1 | 0-2 | 3<br>5<br>18 | 8 | 1.4 | 0.0 | - | | | Very dark brown (10 YR 2/2) fine to medium SAND, some Silt, little Clay, trace fine to coarse Gravel, aplastic, damp to moist, moderately dense, no odor, little coal, dry. Fill. | | |
| | | 2 | 2-4 | 23<br>24<br>14<br>28 | 38 | 1.4 | 0.0 | - | | | Dense, dry. | | |
| 5 | | 3 | 4-6 | 2<br>2<br>1<br>2 | 3 | 0.7 | 0.0 | - | | | Wet. | | Borehole backfilled with bentonite to grade. |
| | 735 | 4 | 6-8 | 3<br>3<br>3<br>6 | 6 | 0.9 | 0.0 | - | SP | | | SAND | |
| | | 5 | 8-10 | 11<br>9<br>8<br>7 | 17 | 1.2 | 0.0 | - | | | Saturated.<br><br>Very dark gray (10 YR 3/1) fine to medium SAND, aplastic, moderately dense, saturated, no odor. | | |
| 10 | 730 | 6 | 10-12 | 3<br>7<br>8<br>11 | 15 | 1.5 | 0.0 | - | | | | | |
| | | 7 | 12-14 | 6<br>12<br>14<br>12 | 26 | 1.5 | 0.0 | - | | | | | |
| | | | | | | | | | CL | | Gray (10 YR 5/1) CLAY, little Silt, trace fine to medium Sand, aplastic, pp>4.5, stiff, dry. Glacial clay till. | CLAY | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; pp=pocket penetrometer
NA = Not Applicable/Not Available; - = Negative Test Result.
1" temporary well screen set 4-14' bgs.
Samples collected 0.3-2.3' and 4.3-6.3' bgs.

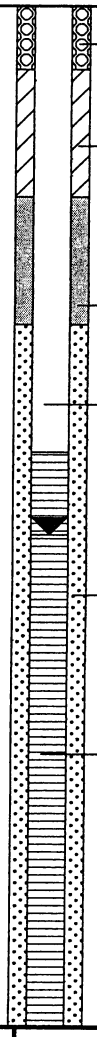
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/27/01 | 8.8' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/21/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Camperon<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 45B | **Northing:** 563966.87<br>**Easting:** 13306353.9<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 741.43<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-08<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 740 | 1 | 0-2 | 7 6 7 9 | 13 | 1.6 | 241 | - | ML | Brown SILT(10 YR 5/3), little fine to coarse subrounded Sand, earthy odor, damp to dry, loose, aplastic, vegetation and organic matter such as roots present. Top soil. | SILT |
| | | | | | | | | | SP | Yellow brown ( 10 Y 5/4) aplastic fine to medium SAND. Some Silt, no odor, damp, dense. Fill. | SAND |
| | | 2 | 2-4 | 24 55/2" | n/a | 0.5 | 189 | - | | Wood. Black, moist, odor present.<br>REFUSAL : Moved hole over @ 2'. No sample. | |
| 5 | | 3 | 4-6 | 8 7 4 3 | 11 | 1.2 | 369 | + | SP | Yellow brown aplastic fine to medium SAND. Some Silt, trace to little rounded Gravel, no odor, damp, dense. Fill. | SAND |
| | 735 | 4 | 6-8 | 3 4 5 7 | 9 | 1.5 | 839 | - | ML-CL | Brown (10 YR 5/3) with black (10 YR 2/1) mottling, some Silt, some fine to coarse angular Sand/slag fragments heavily oxidized and discolored, soft to medium stiff, moist. Fill.<br>Dark yellow brown aplastic SILT, some fine to medium Sand, no odor, moist, dense to moderately dense. Mixed with fine to coarse oxidized gray brown slag.<br>CLAY as at 5.5'-5.9' bgs, no slag.<br>SILT as at 5.9' to 6.8' bgs, very dark grey brown ( 10 YR 3/2). | SILT and CLAY |
| | | 5 | 8-10 | 1 2 3 4 | 5 | 1.0 | 527 | - | | CLAY as at 5.5'-5.9' bgs, no slag.<br>Dark brown (10 YR 4/2) aplastic SILT with Clay, little fine to medium subangular Sand, no odor, saturated, dense. Clayey Sand at 9.8' bgs. | |
| 10 | 730 | 6 | 10-12 | 2 3 3 5 | 6 | 1.5 | 427 | - | CL | Dark gray CLAYwith black motting, some Silt. little fine to medium Sand, trace fine to medium Gravel, no odor, moist to damp, soft. Clay Till. Stiffness increases with depth and black mottling decreases with depth. Oxidation to yellow brown along fractures. At 15.6' bgs, 3" wide light gray brown silt lenses are observed. | CLAY |
| | | 7 | 12-14 | 4 6 6 6 | 12 | 1.8 | 275 | - | | | |
| 15 | | 9 | 14-16 | 6 5 8 8 | 13 | 2.0 | 663 | - | | | |

**Boring Construction**



- Cement pad with 9" diam. flush-mount cover.
- Grout 1-3' bgs.
- Bentonite seal 3-5' bgs.
- 2" ID Sch. 40 PVC riser 0.2-7' bgs.
- #5 Global filter sandpack 5-18' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 7-17' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
PID background = 0.0 ppm;+/- = Positive/Negative Test Result
Samples collected 0-2' and 6-8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/21/01 | 8.3' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-81-08

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 725 | | 16-18 | 11<br>14<br>23<br>40 | 37 | n/a | 464 | - | CL | | Dark gray (10 YR 4/1) CLAY with black motting, iron gray ( 10 YR 6/1) with oxidation to yellow brown ( 10 YR 4/4), some Silt. Little fine to medium Sand, trace fine to medium Gravel, no odor, moist to damp, soft. Clay till. Stiffness increases with depth and black mottling decreases with depth. Oxidation to yellow brown along fractures. At 15.6' bgs, 3" wide light gray brown silt lenses are observed. At 16.2' bgs, hard and dry to damp. | ← CLAY → | 2" ID Sch. 40 PVC 0.010" slotted screen 7-17' bgs.<br>#5 Global filter sandpack 5-18' bgs. |
| 20 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 710 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
PID background = 0.0 ppm;+/- = Positive/Negative Test Result
Samples collected 0-2' and 6-8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/21/01 | 8.3' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/25/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 45B | **Northing:** 563857.46<br>**Easting:** 13306001.94<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 745.89<br><br>**Descriptions By:** SC Kerr | **Boring ID:** RFI-81-09<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | 1 | 0-2 | 1 1 2 3 | 3 | 0.7 | >9999 | - | ML | | Very dark grayish brown (10YR 2/2) SILT, some Clay, little fine Sand, roots and woods, loose, earthy odor, moist to damp (topsoil). | SILT |
| | | 2 | 2-4 | 4 4 5 5 | 9 | 1.3 | >9999 | - | | | Trace medium Gravel and metallic debris, clay decreases to little, dry. | |
| 5 | 740 | 3 | 4-6 | 2 2 4 5 | 6 | 1.0 | 50.5 | - | | | | |
| | | 4 | 6-8 | 5 7 8 9 | 15 | 1.3 | >9999 | - | | | | |
| | | 5 | 8-10 | 4 5 5 7 | 10 | 1.3 | 187 | - | | | | |
| 10 | 735 | 6 | 10-12 | 4 4 6 7 | 10 | 1.5 | >9999 | - | | | Moist. | |
| | | 7 | 12-14 | 6 6 7 9 | 13 | 1.6 | 175 | - | | | Yellow brown (10YR 5/6) SILT, some Clay, little fine to medium Sand, loose, moist, no odor. | |
| 15 | 730 | 8 | 14-16 | 4 6 6 8 | 12 | 1.6 | 118 | - | SM | | Yellow brown (10YR 5/6) fine to medium Silty SAND (predominantly fine grained), wet, loose to moderately dense, saturated at 13.7' bgs, from 14.4' bgs downward silt decreases. | SILTY SAND |

**Boring Construction**

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
PID background = 0.0 ppm; - = Negative Test Result.
Samples collected 0-2', 8-10' and 10-12' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/25/01 | 13.7 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-81-09

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 6, 9, 12, 14 | 21 | 2.0 | 23.4 | - | SM | | Yellow brown (10YR 5/6) fine to medium Silty SAND (predominantly fine grained), wet, loose to moderately dense, saturated at 13.7' bgs, from 14.4' bgs downward silt decreases. | SILTY SAND | 2" ID PVC 0.010" slotted screen 11-21' bgs. |
| | | 10 | 18-20 | 2, 2, 4, 6 | 6 | 1.3 | 225 | - | | | | | #5 Global filter sandpack 9-22' bgs. |
| 20 | 725 | 11 | 20-22 | 5, 7, 9, 14 | 16 | 1.5 | 42.3 | - | ML | | Yellow brown (10YR 5/6) SILT, little fine Sand, locally oxidized, dense, saturated, no odor. | SILT | |
| 25 | 720 | | | | | | | | | | | | |
| 30 | 715 | | | | | | | | | | | | |
| 35 | 710 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
PID background = 0.0 ppm; - = Negative Test Result.
Samples collected 0-2', 8-10' and 10-12' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/25/01 | 13.7 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/21/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 563669.29<br>**Easting:** 13306036.8<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 24' bgs<br>**Surface Elevation:** 746.22<br><br>**Descriptions By:** S.C. Kerr | **Boring ID:** RFI-81-10<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | FL | | Asphalt | | |
| | 745 | 1 | 0-2 | n'a 14 16 20 | 30 | 1.1 | 391 | - | | | Brown (10 YR 5/6) fine aplastic SAND, some Silt, little Clay, trace Gravel, moderately loose, some black staining, dry, no odor, some concrete rubble. | | |
| | | 2 | 2-4 | 15 15 11 30 | 26 | 1.5 | 492 | + | | | Very dark gray, with local oxidation, damp, no more Clay. | | |
| 5 | | 3 | 4-6 | 18 50/3" | NA | 0.8 | 412 | + | | | | | Borehole backfilled with bentonite chips to grade. |
| | 740 | 4 | 6-8 | 8 7 1 3 | 8 | 0.9 | 264 | - | | | Brown (10 YR 5/6) SAND. Some Silt. Loose, dry, no odor. | SAND | |
| | | 5 | 8-10 | 3 3 3 3 | 6 | n/a | 95 | - | SP | | | | |
| 10 | | | | | | | | | | | | | |
| | 735 | 6 | 10-12 | 3 4 3 4 | 7 | 1.2 | 253 | - | | | | | |
| | | 7 | 12-14 | 5 6 6 5 | 12 | 1.7 | 109 | - | | | Saturated | | Temporary well screen set at 10' - 20' bgs. |
| 15 | | 9 | 14-16 | 6 8 9 11 | 17 | 1.4 | 142 | NA | | | Fine to medium and gray (10 YR 5/6). | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
+/- = Positive/Negative Test Result
Samples collected 0.3-2.3', 8.3-10.3' and 10.3-12.3' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/21/01 | 12.3' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-81-10

**Borehole Depth:** 24' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | 10 | 16-18 | 18 9 17 20 | 26 | 1.9 | 124 | NA | SP | | Brown (10 YR 5/6) SAND. Some Silt. Loose, dry, no odor. | SAND | |
| | | 11 | 18-20 | 6 6 8 9 | 14 | 2 | 95.6 | NA | | | | | Temporary well screen set at 10' - 20' bgs. |
| 20 | | 12 | 20-22 | 5 7 8 9 | 15 | 2 | 93.4 | NA | | | | | |
| | 725 | | 22-24 | 12 13 15 20 | 28 | n/a | 174 | NA | | | | | |
| 25 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
+/- = Positive/Negative Test Result
Samples collected 0.3-2.3', 8.3-10.3' and 10.3-12.3' bgs.

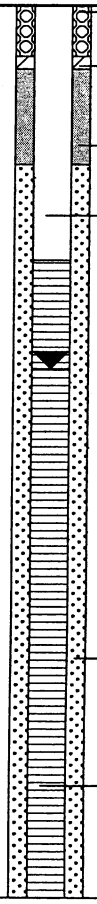
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/21/01 | 12.3' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/20/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Champeron<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 45B | **Northing:** 563897.5<br>**Easting:** 13306339.36<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** 740.34<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-11<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 740 | 1 | 0-2 | 2 5 4 25 | 9 | 2 | 10,500 | - | ML | | Very dark gray brown SILT, little subangular Sand and Clay, aplastic, no odor, damp, moderately loose, organic matter,roots present. Top soil. | SILT |
| | | | | | | | | | SM | | Yellow brown (10 YR 5/6) Silty SAND, little fine to medium Sand, aplastic, no odor, damp, dense. | SILTY SAND |
| | | 2 | 2-4 | 10 20 22 15 | 42 | 1.2 | 10,000 | + | | | WOOD. Possible a railroad tie. No odor, dry, but odor present when drilling. | WOOD |
| | | | | | | | | | SP | | Fine to coarse SAND. Little Silt, few Clay and fine to coarse Gravel, weak odor, aplastic, damp, dense, increasing density with depth. | SAND |
| 5 | 735 | 3 | 4-6 | 7 5 7 10 | 12 | 1.3 | 10,000 | + | | | Dark gray (10 YR 5/1) to black (10 YR 2/1) fine to coarse SLAG, some silt, damp, dense. | |
| | | | | | | | | | ML | | Very dark brown (10 YR 2/2) SILT, little fine subangular Sand, weak odor, moist to wet, dense, aplastic | |
| | | 4 | 6-8 | 3 5 6 7 | 11 | 1.6 | 249 | + | SP | | Very dark brown (10 YR 2/2) fine to medium subangular SAND, some Silt, trace Clay, moderate odor, aplastic, wet (saturated), moderately dense to dense, oily sheen. | |
| | | 5 | 8-10 | 18/ 5" | - | 0.5 | 1975 | + | FL | | CONCRETE, mixed with silt to coarse gravel sized fragments of slag and anthracite coal. | |
| 10 | 730 | | | | | | | | SP | | Sand as above (6.0'-8.5' bgs). | |
| | | 6 | 10-12 | 3 3 5 6 | 8 | 1.0 | 474 | - | | | Gray (10 YR 5/1) CLAY with oxidation and mottling to dark yellow brown (10 YR 4/4) and leaching to light gray (10 YR 7/1), some Silt, little fine to medium subangular to subrounded Sand, trace to few fine to medium subrounded to rounded Gravel, no odor, damp, very stiff to stiff. | CLAY |
| | | | 12-14 | 3 3 5 7 | 8 | 2.0 | 69.5 | - | CL | | Increase in stiffness with depth at 12' bgs and decrease in mottling with depth. No bleaching below 12.0' bgs. | |
| 15 | 725 | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface.
NA = Not Applicable/Not Available.
+/- = Positive/Negative Test Result;
Samples collected 0-2', 2-4' and 4-6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/20/01 | 5.7' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/15/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-12<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | 0-2 | n/a<br>n/a | n/a | n/a | n/a | NA | GP | | Coarse angular to subangular GRAVEL, no odor, dry, loose. Fill mixed with cobble sized black fragments of anthracite coal. Also mixed with top soil, little Silt and occasional vegetation and roots. | GRAVEL | |
| | | | 2-4 | n/a<br>n/a | n/a | n/a | n/a | NA | | | Wood. | WOOD | |
| 5 | 5 | 1 | 4-6 | 4<br>2<br>8<br>12 | 10 | 2 | 4891 | + | SP | | Black (10 YR 2/1) anthracite coal with angular SAND, little Silt and fine to medium angular Gravel, all predominantly anthracite coal fragments, no odor, moderately dense, damp to moist. | SAND | Borehole backfilled with bentonite chips to grade. |
| | | 2 | 6-8 | 4<br>3<br>3<br>4 | 6 | 2 | 6414 | - | CL | | Gray CLAY (10YR5/1) with dark yellow brown (10 YR5/1) oxidation, some Silt, little fine subangular to subrounded Sand, few fine to medium subrounded Gravel, moderately stiff, no odor, moist. Black at 7.2' bgs. | CLAY | |
| | | 3 | 8-10 | 1<br>1<br>3<br>4 | 4 | 1.6 | 2349 | - | | | Lense of silt to medium gravel sized ANTHRACITE COAL fragments. Wet (saturated) . | | |
| 10 | 10 | 4 | 10-12 | 2<br>2<br>6<br>8 | 8 | 1.3 | 1683 | - | | | Gray CLAY as above (8.6'-8.8' bgs)<br>Saturated SILT lense.<br>Gray CLAY as above (8.8'-9.3' bgs). Decrease in mottling at 10.0' bgs; predominantly grey ( 10YR 5/1). At 11.0'bgs, 1" wide lense of anthracite coal as at 8.6-8.8' bgs. Increase of the level of oxidation along fractures and selvages to yellow brown (10 YR 5/4). Moderately stiff to stiff. Decrease in moisture content (damp). | CLAY | Temporary well screen installed at 18'-8' bgs. |
| | | 5 | 12-14 | 4<br>5<br>9<br>10 | 14 | 1.8 | 24.7 | - | | | Gray CLAY as above (8.8'-9.3' bgs) but no oxidation present, stiff, damp. | | |
| 15 | 15 | 6 | 14-16 | 3<br>4<br>6<br>7 | 10 | 1.5 | 160 | - | | | Gray CLAY as above (8.8'-9.3' bgs) but with intermittent saturated Silt lenses at 15.5', 15.9' and 16.6' bgs. Stiff to | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
+/- = Positive/Negative Test Result
Well Decommissioned.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/15/01 | 6.0' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-81-12

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 7 | 16-18 | 3 5 7 8 | 12 | 1.5 | 202 | - | CL | | moderately stiff. | CLAY | Temporary well screen installed at 18'-8' bgs. |
| | | 8 | 18-20 | 3 5 6 5 | 11 | 1.5 | 394 | - | ML | | Gray (10 YR 5/1) SILT, little Clay, no odor, saturated, moderately dense, aplastic. | SILT | |
| 20 | 20 | | | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
+/- = Positive/Negative Test Result
Well Decommissioned.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/15/01 | 6.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/28/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 563494.2<br>**Easting:** 13306419.8<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 737.0<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-12R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | | | |
| 0 | | | | | | | | | | | Coarse grained angular sand- to cobble-sized anthracite COAL fragments. Aggregate - fill.<br>Blind drilling without sampling to 18' bgs. Allowed augers to sit; greater than 1' of water in augers. Saturated cuttings emerged during the drilling of the last 5' (10-15' bgs). | See original borings logs for RFI-81-12. | Cement pad with 9" diam. flush-mount cover.<br>Grout 1-4' bgs.<br>Bentonite seal 4-6' bgs.<br>2" ID Sch. 40 PVC riser 0.2-8' bgs.<br>Global #5 sand pack 6-18' bgs.<br>2" ID Sch. 40 PVC 0.010" slotted screen 8-18' bgs. |
| | 735 | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |
| | 730 | NA | NA | NA | NA | NA | NA | NA | | | | | |
| 10 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
See original boring logs for RFI-81-12.
Set 2" diameter permanent well, screened 8-18' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-81-12R

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 720 | | | | | | | | | | Blind drilling without sampling to 18' bgs. Allowed augers to sit; greater than 1' of water in augers. Saturated cuttings emerged during the drilling of the last 5' (10-15' bgs). | | Global #5 sand pack 6-18' bgs. |
| 20 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 710 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 705 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
See original boring logs for RFI-81-12.
Set 2" diameter permanent well, screened 8-18' bgs.

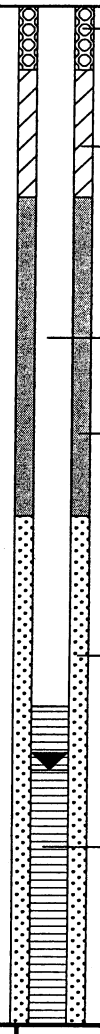
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/27/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 564497.9<br>**Easting:** 13306302.47<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 744.61<br><br>**Descriptions By:** S Kerr / SM Duly | **Boring ID:** RFI-81-13<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 9 25 12 14 | 37 | 1.2 | 4.0 | - | ML | | Very dark brown (10 YR 2/2) SILT, some fine to medium Sand, trace Clay, trace fine to coarse Gravel, roots and organic matter (topsoil), loose, dry, earthy odor. | SILT |
| | | 2 | 2-4 | 15 24 50/ 4" | NA | 1.2 | 2.8 | - | | | Dense, damp. | |
| | | | | | | | | | FILL | | Concrete fragments. | FILL |
| | 740 | 3 | 4-6 | 1 2 3 4 | 5 | 0.8 | 0.0 | - | ML | | Dark brown (10 YR 3/3) SILT, some fine to coarse subangular to subrounded Sand, few Clay, aplastic, no odor, moderately dense, damp to moist. | SILT |
| 5 | | 4 | 6-8 | 5 2 4 12 | 6 | 1.3 | 0.0 | - | | | | |
| | | | | | | | | | FILL | | Concrete, rubbly drilling, spoon refusal. | FILL |
| | 735 | 5 | 8-10 | 50/ 0" | NA | 0.0 | 0.4 | - | ML | | SILT, as at 3.8-8' bgs, mixed with large cobble- to pebble-sized angular concrete fragments. | SILT |
| 10 | | 6 | 10-12 | 2 4 4 6 | 8 | 0.3 | 0.0 | - | | | | |
| | | 7 | 12-14 | 3 3 2 2 | 5 | 1.8 | 0.2 | - | | | SILT, as at 3.8-8' bgs, but no concrete, few fine to coarse subrounded Gravel, brown (10 YR 2/1), saturated, increased clay content last three inches. | |
| | 730 | 8 | 14-16 | 2 5 5 4 | 10 | 1.2 | 0.0 | - | | | | |
| 15 | | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2', 6-8' and 10-12' bgs.
- = Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/27/01 | 12.0' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-81-13

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | NA | NA | NA | NA | NA | CL | | Dark gray (10 YR 4/1) Silty CLAY, little fine to coarse subangular to subrounded Sand, few fine subrounded Gravel, very stiff, no odor, damp. Clay Till.<br>at 16.5': Gray (10 YR 5/1) with yellow-brown (10 YR 5/4) mottling throughout, local patches of increased silt to a SILT with CLAY, dry. | SILTY CLAY | #5 Global filter sand pack 8-18' bgs |
| 20 | 725 | | | | | | | | | | | | |
| 25 | 720 | | | | | | | | | | | | |
| 30 | 715 | | | | | | | | | | | | |
| 35 | 710 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0-2', 6-8' and 10-12' bgs.
- = Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 8/27/01 | 12.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 9/17/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** hand auger<br>**Sampler Size:** NA<br>**Auger Size:** 3" bucket<br>**Rig Type:** NA | **Northing:** 565290.66<br>**Easting:** 13306456.9<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 2' bgs<br>**Surface Elevation:** 742.81<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-19<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | |
| 0 | | 1 | 0-2 | 100% | 4.5 | - | SP | | Black (10 YR 2/1) fine to coarse angular SAND, some Silt, few fine to coarse angular Gravel, Slag, no odor, loose, dry. Large aggregate gravel fill first three inches of upper contact. | SLAG/FILL | Borehole backfilled with bentonite to grade. |
| | 740 | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| | 735 | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| | 730 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Sample collected 0-2' bgs;
- = Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 8/4/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 564732.24<br>**Easting:** 13305914.45<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 15' bgs<br>**Surface Elevation:** 745.86<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-20<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | | | | | | | FILL | | Concrete. | |
| | | 1 | 1-3 | 3 4 5 6 | 9 | 1.3 | 4461 | + | SP | | Yellow-brown (10 YR 5/6) to dark gray-brown (10 YR 4/2) (mottled) fine to medium subangular SAND, some Silt, few to little fine to coarse gravel-sized lightweight debris, aplastic, no odor, dry, loose, little fine to medium subangular gravel-sized concrete pieces. Fill/Foundry sand. | FILL |
| | | 2 | 3-5 | 6 5 4 4 | 9 | 1.2 | >10,000 | + | | | Becomes dark yellow-brown (10 YR 4/4), no gravel, occasional dark brown to black varves. | SAND |
| 5 | 740 | 3 | 5-7 | 3 4 6 7 | 10 | 1.3 | 4992 | - | | | More dense, black (10 YR 2/1), trace Clay. | |
| | | 4 | 7-9 | 6 7 13 15 | 20 | 1.6 | >10,000 | - | | | Moist. | |
| 10 | | 5 | 9-11 | 4 6 8 8 | 14 | 1.7 | >10,000 | - | ML | | Dark gray-brown (10 YR 4/2) SILT, some Clay, few fine to medium subangular to subrounded Sand, occasional fine to medium subrounded Gravel, aplastic, no odor, dense, moist. | SILT |
| | 735 | | | | | | | | SM | | Brown (10 YR 4/3) SILTY SAND, trace Clay, plastic, no odor, saturated, moderately dense to dense. | SAND |
| | | 6 | 11-13 | 2 5 7 11 | 12 | 2.0 | 787 | - | CL | | Gray (10 YR 6/1) CLAY, occasional silt lenses up to 4" wide but predominantly 1-2" wide throughout, moist. | CLAY |
| | | 7 | 13-15 | 5 9 11 18 | 20 | 1.9 | >10,000 | - | | | Damp to dry, gray (10 YR 5/1), very stiff, increasing stiffness and dryness with depth. | |
| 15 | 730 | | | | | | | | | | | |

**Boring Construction**

Borehole backfilled with bentonite to grade.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs=below ground surface;
+/- = Positive/Negative Test Result;
NA = Not Applicable/Not Available.
Samples collected 1-3', 3-5' and 7-9' bgs.
Set temporary well screen 7-12' bgs.

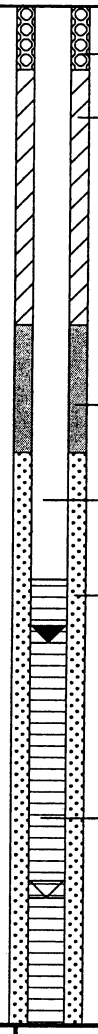
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 9/17/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Dennis Emery<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 565334.47<br>**Easting:** 13306865.57<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** 753.8<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-21<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 755 | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 5 13 16 19 | 29 | 2.0 | 0.0 | - | | | Dark yellow-brown (10 YR 4/6) SILT, some fine to coarse subrounded Sand, little Clay, few fine to coarse subrounded to rounded Gravel, aplastic, earthy odor, dry, dense to moderately dense, vegetation and roots present. Topsoil. | SILT |
| | | 2 | 2-4 | 14 10 12 13 | 22 | 2.0 | 0.0 | - | ML | | Yellow-brown (10 YR 5/6) SILT, little fine to coarse subrounded Sand, some Clay, trace fine to coarse subrounded to rounded Gravel, aplastic, no odor, dry, locally heavily oxidized, dense. Till. | |
| | 750 | 3 | 4-6 | 7 8 8 7 | 16 | 1.8 | 0.0 | - | | | Damp. | |
| 5 | | 4 | 6-8 | 2 3 3 3 | 6 | 1.9 | 0.0 | - | | | Light yellow-brown (10 YR 6/4) Silty fine subangular SAND, trace to few Clay, aplastic, no odor, moderately loose, damp. Glacial-alluvial. | SILTY SAND |
| | 745 | 5 | 8-10 | 2 3 4 8 | 7 | NA | 0.0 | - | SM | | Moist, occasional silty clay lenses up to 1" thick throughout. | |
| 10 | | | | | | | | | | | Saturated. | |
| | | 6 | 10-12 | 5 9 12 12 | 21 | 2.0 | 0.0 | - | | | Pale brown (10 YR 6/3) fine to medium subangular SAND, little to some Silt, trace Clay, aplastic, no odor, dense, moist. Glacial-alluvial. | SAND |
| | | 7 | 12-14 | 3 5 7 10 | 12 | 1.5 | 0.0 | - | SP | | Occasional silt lenses up to 3" thick throughout. | |
| | 740 | 8 | 14-16 | 4 6 7 8 | 13 | 1.6 | 1.6 | - | | | Saturated, becomes gray in color. | |
| 15 | | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs=below ground surface;
+/- = Positive/Negative Test Result;
NA = Not Applicable/Not Available.
Samples collected 0-2' and 8-10' bgs;
Set 1" diameter well screen 9-19' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 9/17/01 | 10.0, 14.0' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-81-21

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 4 7 6 5 | 13 | 1.7 | 0.0 | - | SP | | Gray fine to medium subangular SAND, little to some Silt, trace Clay, aplastic, no odor, dense, saturated. Glacial-alluvial. | SAND | 1" ID Sch. 40 PVC 0.010" slotted screen 9-19' bgs; #5 Global filter sand pack 7-19' bgs |
| | 735 | 10 | 18-20 | 1 3 8 12 | 11 | NA | 0.0 | - | | | | | |
| 20 | | | | | | | | | | | | | |
| | 730 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs=below ground surface;
+/- = Positive/Negative Test Result;
NA = Not Applicable/Not Available.
Samples collected 0-2' and 8-10' bgs;
Set 1" diameter well screen 9-19' bgs.

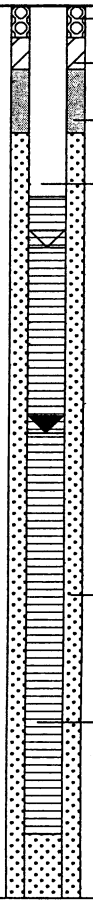
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 9/17/01 | 10.0, 14.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/22/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3'/4" ID<br>**Rig Type:** CME 45B | **Northing:** 564732.56<br>**Easting:** 13306473.82<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** 742.58<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-22<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 3, 10, 14, 12 | 24 | 1.8 | 211 | - | ML | | Very dark gray-brown (10 YR 3/2) SILT, little fine to medium subangular to subrounded Sand, few to little Clay, aplastic, earthy odor, damp with rainfall, moderately loose. Vegetation and organic matter such as roots present. Topsoil, mixed with little to some coarse subangulargravel aggregate. | FILL |
| | | | | | | | | | | | Black (10 YR 2/1) silt to coarse gravel-sized angular SLAG, no odor, moderately dense to dense, dry. | |
| | 740 | 2 | 2-4 | 6, 7, 7, 6 | 14 | 1.5 | 283 | - | CL | | Gray (10 YR 4/1) Silty CLAY, little fine to medium subangular to subrounded Sand, moderately stiff, no odor, damp. | CLAY |
| | | | | | | | | | ML | | Brown (10 YR 5/3) SILT, some fine subangular Sand, aplastic, dense, no odor, moist. Saturated at 3.8'. | SILT |
| 5 | | 3 | 4-6 | 3, 1, 3, 3 | 4 | 1.3 | 245 | - | CL | | Silty CLAY as above at 2-3' bgs, but soft, saturated. | |
| | | | | | | | | | ML | | SILT, as at 3-4.8' bgs, but with black (10 YR 2/1) mottling, wood debris at upper contact, increased Sand to some. | SILT |
| | | 4 | 6-8 | 3, 3, 3, 9 | 6 | NA | 67.4 | - | CL | | Silty CLAY as at 2-3' bgs, but soft, saturated. | CLAY |
| | 735 | 5 | 8-10 | 3, 3, 5, 8 | 8 | 1.4 | 90.3 | - | SP | | Gray (10 YR 5/1) subangular fine to medium (predominantly fine) SAND, aome Silt, aplastic, moderatele dense, no odor, saturated. Locally oxidized to yellow-brown (10 YR 5/4). Possibly alluvial/riverine sand. | SAND |
| 10 | | 6 | 10-12 | 4, 7, 9, 7 | 16 | 2.0 | 82.8 | - | | | | |
| | 730 | 7 | 12-14 | 5, 9, 15, 18 | 24 | 1.5 | 68.3 | - | CL | | Gray (10 YR 5/1) CLAY, heavily oxidized to yellow-brown (10 YR 5/6) first 2", little fine to medium subangular to subrounded Sand, trace to few fine to medium subrounded to rounded Gravel, moderately stiff to hard with depth, no odor, damp, becoming dry with depth. Clay Till. | CLAY |
| 15 | | | | | | | | | | | | |

**Boring Construction**



- Cement pad with 9" diam. flush-mount cover
- Grout 0.5-1' bgs
- Bentonite seal 1-2' bgs
- 2" ID Sch. 40 PVC riser 0.2-3' bgs
- #5 Global filter sand pack 2-14' bgs
- 2" ID Sch. 40 PVC 0.010" slotted screen 3-13' bgs

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Sample collected 0-2' bgs;
- = Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/22/01 | 3.8', 6.7' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 9/7/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2" ID acetate sleeve<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 7' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-23<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | FILL | | Concrete. | FILL | Borehole backfilled with bentonite to grade. |
| | | 1 | 1-4 | 3.0 | 51.8 | + | ML | | Dark gray (10 YR 4/1) SILT, little fine subangular Sand, little Clay, rare coarse rounded Gravel, aplastic, weak odor, moist, moderately dense. | SILT | |
| | | | | | 24.6 | + | | | Saturated at 1.7' bgs.<br>Brown (10 YR 5/3). | | |
| 5 | 5 | 2 | 4-7 | 3.0 | 4.6 | - | | | | | |
| | | | | | 10.2 | - | | | Moist. | | |
| | | | | | | | | | Moist to damp. | | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs=below ground surface;
+/- =Positive/Negative Test Result;
NA = Not Applicable/Not Available;
Set temporary well screen 1-6' bgs;
Sample collected 0.9-1.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 9/7/01 | 1.7' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 9/7/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2" ID acetate sleeve<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 7' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-24<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | FILL | | Concrete. | FILL | Borehole backfilled with bentonite to grade. |
| | | 1 | 1-4 | 2.0 | 0.0 | - | ML | | Dark gray (10 YR 4/1) SILT, little fine subrounded to subangular Sand, little Clay,aplastic, no odor, moist to saturated (at 1.5' bgs), moderately dense. Fill<br>at 2': Black (10 YR 2/1) mottling.<br>Wood debris, black (10 YR 2/1). | SILT | |
| 5 | 5 | 2 | 4-7 | NA | 0.0 | - | SP | | Very dark gray (10 YR 3/1) fine to medium subangular to subrounded SAND, little to some Silt with increased silt with depth, trace Clay, no odor, saturated. | SAND | |
| | | | | | 0.0 | - | MI | | Gray (10 YR 5/1) SILT, as at 1.3-5' bgs. | SILT | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Set temporary well screen 1-6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 9/7/01 | 1.5' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/03/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" OD<br>**Auger Size:** 2 1/4" ID HSA<br>**Rig Type:** CME55 | **Northing:** 564072.88<br>**Easting:** 13305810.69<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** 743.95<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-25<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | | |
| 0 | | | NA | NA | NA | NA | NA | NA | | | Concrete. | | |
| | | 1 | 0.8-2.8 | 9<br>17<br>28<br>46 | 45 | 1.3 | NA | NA | FL | | Yellow-brown 10YR 5/4 fine subangular SAND, little Silt, trace Clay, poorly graded, no odor, dense, aplastic, damp.<br>Black 10YR 2/1 angular fine to coarse sand-sized ASH and CINDERS, some silt-sized, few gravel-sized, no odor, dense, aplastic, damp. | SAND | |
| | 740 | 2 | 2.8-4 | 50/<br>5" | NA | 0.2 | NA | NA | | | CONCRETE and SLAG RUBBLE mixed with angular fine to coarse grained sand-sized Ash and Cinders, some silt-sized, few gravel-sized, no odor, dense, aplastic, damp. | RUBBLE | |
| 5 | | 3 | 4-6 | 50/<br>1" | NA | NA | NA | NA | | | In-situ CONCRETE slab (12"). | FILL | |
| | | | NA | NA | NA | NA | NA | NA | SM | | Very dark brown 10YR fine to medium grained Silty SAND, little Clay, little fine to coarse subangular Gravel, mostly poorly graded, no odor, moderately dense becoming increasingly dense with depth, damp. Fill/Foundry Sand. | SILTY SAND | Borehole backfilled with bentonite to grade. |
| | 735 | 4 | 8-10 | 5<br>4<br>2<br>1 | 6 | 1.2 | NA | NA | | | | | |
| 10 | | | | | | | | | | | | | |
| | 730 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.8-2.8' and 8-10' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/12/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2" ID acetate sleeve<br>**Auger Size:** NA<br>**Rig Type:** Truck Mounted Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 2' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-26<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | NA | NA | NA | NA | FL | | Concrete (reinforced). | Concrete | Borehole backfilled with bentonite to grade. |
| | | | | | | | | | Refusal at 1.2' bgs. Unable to go farther with concrete bits on truck-mounted geobprobe. No sample. | | |
| 5 | 5 | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
No samples collected.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

Project: 64410.101 Template: j:\rockware\logplot2001\logfiles\64410\geoprobe.ldf
Data File:RFI-81-26.dat
Date: 12/21/01

| | | |
|---|---|---|
| **Date Start/Finish:** 12/12/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4' x 2" ID acetate sleeve<br>**Auger Size:** NA<br>**Rig Type:** Truck-mounted Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 2' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-27<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | NA | NA | NA | NA | FL | | Reinforced CONCRETE. | Fill | Borehole backfilled with bentonite to grade. |
| | | | | | | | | | End of Boring. Can no longer drive bit further. No sample. | | |
| 5 | 5 | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Refusal in concrete. No samples collected.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/12/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4' x 2" ID Acetate Sleeve<br>**Auger Size:** NA<br>**Rig Type:** Truck-mounted Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 2.5' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-28<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | FL | | Concrete. | | |
| | | 1 | 0.5-2.5 | 1 | NA | NA | SM | | Yellow-brown, (10YR 5/4) Silty SAND, poorly graded fine to coarse subangular Sand, predominantly fine to medium, no odor, moderately dense, aplastic, dry. Fill.<br><br>2.0-2.5 Black (10YR 2/1) Silty SAND, poorly graded fine to medium subangular to angular Sand, few Clay, no odor, dense, aplastic, dry. Fill/Foundry Sand. | SILTY SAND | Borehole backfilled with bentonite to grade (0-2.5' bgs). |
| | | | | | | | | | End of boring. CONCRETE. | | |
| 5 | 5 | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0.5-2.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/13/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2" ID x 4' Acetate Sleeve<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 564756.52<br>**Easting:** 13305913.82<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 1.1' bgs<br>**Surface Elevation:** 745.95<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-29<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | NA | NA | NA | NA | FL | | Reinforced CONCRETE. | FILL | Borehole backfilled with bentonite to grade. |
| | | | | | | | | | End of boring. No samples. | | |
| 5 | 740 | | | | | | | | | | |
| 10 | 735 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/13/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4' x 2" Acetate Sleeve<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 564706.99<br>**Easting:** 13305912.99<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 5.2' bgs<br>**Surface Elevation:** 746.02<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-30<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | Concrete. | FILL | |
| | | 1 | 1.2-5.2 | 3.2 | NA | NA | SM | | Dark yellow-brown (10YR) subrounded to subangular poorly graded Silty SAND, fine to medium Sand, few Clay, no odor, dense, aplastic, dry. Fill/Foundry Sand. | SILTY SAND | Borehole backfilled with bentonite to grade (0-5.2' bgs). |
| | | | | | | | SW | | Yellow brown (10YR 5/4) angular, fine to coarse, well graded SAND, few Silt, no odor, very dense to semi-lithified, aplastic, dry. | | |
| | | | | | | | SM | | Dark yellow-brown (10YR) subrounded to subangular poorly graded Silty SAND, fine to medium Sand, few Clay, no odor, dense, aplastic, dry. Fill/Foundry Sand. | | |
| 5 | 5 | | | | | | SW | | Yellow brown 910YR 5/40 angular, fine to coarse, well graded SAND, few Silt, no odor, very dense to semi-lithified, aplastic, dry. | | |
| | | | | | | | | | Borehole terminated at 5.2'. | | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1.2-3.2' and 3.2-5.2' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/13/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2" ID acetate sleeve<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 5' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-31<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | FL | | Concrete. | | |
| | | 1 | 1-5 | 2.3 | NA | NA | SW | | Very dark brown (10 YR 2/2) well graded angular SAND, little Silt, few fine to coarse angular Gravel, trace Clay, no odor, moderately dense, aplastic, dry. Fill/Foundry Sand. | SAND | Borehole backfilled with bentonite to grade. |
| 5 | 5 | | | | | | | | Borehole terminated at 5' bgs. | | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/13/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2" ID acetate sleeve<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 564729.44<br>**Easting:** 13305891.27<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 5' bgs<br>**Surface Elevation:** 746.01<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-32<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | FL | | Reinforced CONCRETE. | | |
| | | 1 | 1-5 | 2.3 | NA | NA | SW | | Very dark brown (10YR 2/2) well graded angular SAND, little Silt, few fine to coarse angular Gravel, trace Clay, no odor, moderately dense, aplastic, dry. Fill/Foundry Sand. | SAND | Borehole backfilled with bentonite to grade. |
| 5 | 5 | | | | | | | | Borehole terminated at 5' bgs. | | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Samples collected 1-3' and 3-5' bgs.

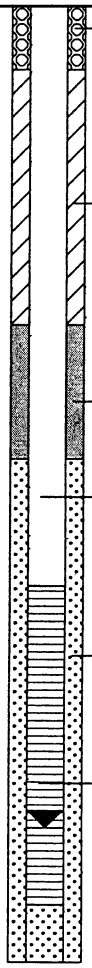
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/18/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 75 | **Northing:** 566145.82<br>**Easting:** 13307019.25<br>**Casing Elevation:** 751.64<br><br>**Borehole Depth:** 15' bgs<br>**Surface Elevation:** 751.74<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-33<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-2 | 10 17 15 10 | 32 | 1.5 | 0.0 | - | ML | | Black (10 YR 2/1) SILT, some fine to coarse angular fragments of anthracite Coal, aplastic, no odor, dry, dense. | SILT |
| | | | | | | | | | Fill | | Coarse gravel- to pebble-sized rounded to subrounded AGGREGATE, no odor, dry, loose. No recovery 2-4' bgs. | GRAVEL |
| | | 2 | 2-4 | 10 11 10 11 | 21 | 0.0 | NA | NA | SP | | Dark yellow-brown (10 YR 4/4) medium poorly graded subangular to angular SAND, little Silt, aplastic, no odor, damp, loose. Foundry sand. | SAND |
| | | | | | | | | | CL | | Brown (10 YR 4/3) Silty CLAY, little fine to medium subangular Sand, weakly plastic, no odor, hard to very stiff, dry. | |
| 5 | 5 | 3 | 4-6 | 17 18 22 25 | 40 | 2.0 | 0.0 | - | SM | | Black (10 YR 2/1) Silty fine to medium subangular to subrounded SAND, little Clay, aplastic, no odor, damp, dense. Foundry sand. at 5.2': Moist. | SILTY SAND |
| | | 4 | 6-8 | 5 15 11 9 | 26 | 2.0 | 0.0 | - | CL | | Brown (10 YR 5/3) Silty CLAY, little fine to coarse subangular to subrounded Sand, few fine to medium rounded Gravel, weakly plastic, no odor, damp, stiff. Few pebbles at first inch of upper contact. Clay Till. | SILTY CLAY |
| | | 5 | 8-10 | 5 7 6 8 | 13 | 2.0 | 0.0 | - | | | | |
| 10 | 10 | 6 | 10-12 | 3 3 5 4 | 8 | 1.8 | 0.0 | - | | | Gray-brown (10 YR 5/2).<br>Very dark brown (10 YR 2/2).<br>at 10.8': Pebbles and cobbles to lower contact. | |
| | | | | | | | | | SP | | Gray-brown (10 YR 5/2) fine subangular poorly-graded SAND, some Silt, few Clay, aplastic, no odor, wet, moderately dense. | |
| | | 7 | 12-14 | 4 4 6 10 | 10 | 1.7 | 0.0 | - | CL | | Silty CLAY, as at 6.9-11' bgs, but gray (10 YR 5/1) with yellow-brown (10 YR 5/4) mottling (possible oxidation) and occasional possible bleaching to white (10 YR 8/1), very stiff to hard with increasing depth. Clay Till.<br>at 12.9': Saturated silt seams/lenses throughout up to 3" wide. Soft, moist clay in between. | SILTY CLAY |
| | | | | | | | | | SM | | Brown (10 YR 3/3) Silty fine subangular well-graded SAND, few Clay, aplastic, no odor, saturated, loose. | |
| 15 | 15 | 8 | 14-16 | 27 50/ 4" | NA | 0.9 | 0.0 | - | CL | | Gray (10 YR 6/1) Silty CLAY, few fine subrounded Sand, trace fine rounded Gravel, homogeneous, weakly plastic, no odor, dry, hard. Oxidation along cracks for upper 3 inches. Clay Till. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Samples collected 0-2', 8-10' and 10-12' bgs;
- = Negative Shake Test.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/18/02 | 12.9' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/14/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Camperon<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2" ID x 2'<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 75 | **Northing:** 563853.43<br>**Easting:** 13306495.59<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12.5' bgs<br>**Surface Elevation:** 736.94<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-34<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | | | | | |
| | | | | - - | | | | | Fill | | Reinforced concrete. | FILL | |
| | | 1 | 0-2 | 1 2 | 1 | 0.6 | NA | - | SM | | Very dark brown (10 YR 2/2) Silty fine subangular poorly-graded SAND, little to few Clay, aplastic, no odor, dry to damp, moderately dense. Foundry sand. | SILTY SAND | |
| | | 2 | 2-4 | 3 2 3 3 | 5 | 1.5 | NA | - | | | | | |
| 5 | 5 | | 4-6 | NA | NA | 1.0 | NA | NA | Fill | | Concrete. | FILL | Borehole backfilled with bentonite to grade. |
| | | 3 | 6-8 | 4 4 3 2 | 7 | 1.2 | NA | - | | | Dark yellow-brown (10 YR 3/6) fine to coarse subangular to subrounded sand-sized CINDERS and SLAG, few rounded fine to coarse gravel-sized dark gray metallic debris and slag, no odor, dry, moderately loose. | SAND | |
| | | 4 | 8-10 | 4 8 18 11 | 26 | 1.8 | NA | - | | | Black (10 YR 2/1) Coal fragments. | | |
| 10 | 10 | 5 | 10-12 | 4 4 7 7 | 11 | 1.5 | NA | + | SM | | Dark brown (10 YR 3/3) to black (10 YR 2/1) mottled Silty fine subangular poorly-graded SAND, little Clay, local patches of fine to coarse angular slag or cinders debris, aplastic, no odor, moist, moderately dense. Foundry sand with slag. Saturated at 10.9' bgs. | SILTY SAND | |
| | | 6 | 12-12.5 | 4 50/ 3" | NA | 0.5 | NA | NA | | | | | |
| | | | | | | | | | | | Refusal in concrete at 12.5' bgs. | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Borehole moved 1.5' from original location;
+/- = Positive/Negative Shake Test.

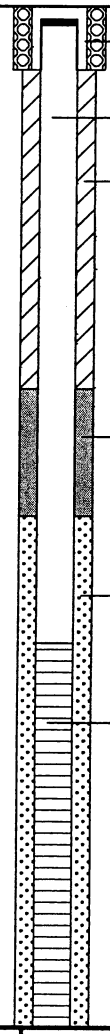
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/14/02 | 10.9' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/18/02<br>**Drilling Company:** RAU<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2" ID x 2'<br>**Auger Size:**<br>**Rig Type:** | **Northing:** 564091.81<br>**Easting:** 13305961.93<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** 743.23<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-81-35<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | SS | 3 6 8 8 | 14 | 1.3 | 0.0 | - | FL | | Reinforced CONCRETE. | FILL |
| | | 2 | SS | 10 12 16 27 | 28 | 2.0 | 21.6 | - | SM | | Yellow-brown (10YR 5/4) well-graded fine to medium subrounded to subangular SAND, some Silt, few Clay, no odor, dry, dense. Fill with metallic debris and Slag throughout.<br>Brown (10YR 4/3), Slag and metallic debris present at 2.2' bgs.<br>Light yellow-brown (10YR 6/4), no Slag or debris present from 3.0' - 4.6' bgs. | SAND |
| 5 | 5 | 3 | SS | 50/2" | - | 0.0 | NA | NA | | | Dark brown (10YR 3/3), Slag and metallic debris present. | |
| | | 4 | SS | 3 5 5 4 | 10 | 1.5 | 42.5 | - | | | | |
| | | 5 | SS | NA | NA | 2.0 | NA | NA | | | Color change to light yellow-brown (10YR 6/4).<br>Dark gray shinny metallic debris. | |
| 10 | 10 | 6 | SS | 4 5 3 2 | 8 | 1.8 | 9.0 | - | | | | |
| | | 7 | SS | 10 11 8 44 | 19 | 0.8 | 5.7 | + | ML | | Dark brown (10YR 2/2) SILT, little Clay and fine to coarse subangular Sand, aplastic, no odor, damp, moderately dense.<br>Color change to black (10YR 2/1), weak odor, moist. | SILT |
| 15 | 15 | 8 | SS | 11 10 9 7 | 19 | 2.0 | 0.0 | + | SP | | Gray-brown (10YR 5/2) fine to medium poorly-graded SAND, little Silt, aplastic, weak odor, moderately dense, saturated. | SAND |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Samples collected 0.8-2.8', 8-10' and 12-14' bgs;
+/- = Positive/Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | 1/18/02 | 14' |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-81-35

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NA | NA | NA | NA | NA | NA | NA | SP | | Gray-brown (10YR 5/2) fine to medium poorly-graded SAND, little Silt, aplastic, weak odor, moderately dense, saturated. | SAND | Global Filter Sand (8.0' - 20' bgs); 2-inch 0.010" Machine-Slotted PVC Screen (10' - 20' bgs); PVC Cap |
| 20 | 20 | | | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Samples collected 0.8-2.8', 8-10' and 12-14' bgs;
+/- = Positive/Negative Test Result.

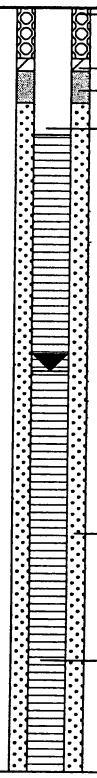
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | 1/18/02 | 14' |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/18/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 563161.47<br>**Easting:** 13305595.65<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** 741.34<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 740 | 1 | 0-2 | NA NA NA NA | NA | 1.3 | 4781 | - | GW | | Angular GRAVEL, loose, no odor, dry. Spoon refusal. | GRAVEL |
| | | 2 | 2-4 | 2 3 3 4 | 6 | 1 | 652 | - | SP<br>CL | | Coarse subrounded to subangular brown (10 YR 3/3) poorly graded Sand, little Silt, few medium rounded Gravel, dry to damp, no odor, loose. Fill.<br>Brown (10 YR 5/3) Silty lean CLAY, little to some fine to medium subangular Sand, no odor, damp, moderately stiff. | SAND |
| 5 | | 3 | 4-6 | 2 2 4 5 | 6 | 1.6 | 98.4 | - | SP | | Sand as above (2.0'-2.7' bgs) but predominantly fine to medium, few fine to medium rounded to subrounded Gravel, locally mottled to black (10 YR 2/1). Fill. At 5.0' bgs, becomes dark brown (10 YR 4/5) and no more gravel. At 6.8' bgs, black (10 YR 2/1) to lower contact. | |
| | 735 | 4 | 6-8 | 2 4 6 6 | 10 | 1.2 | 10.9 | - | | | | |
| | | 5 | 8-10 | 2 2 4 6 | 6 | 1.8 | 10.0 | - | CL | | Gray (10 YR 4/1) lean CLAY, some Silt, little fine to medium subrounded Sand, no odor, moderately stiff, damp, no oxidation present. Glacial till. At 9.0' bgs, decrease in the sand content (few) and local in increase in Silt to a Silty Clay. Becomes stiff after 10.0' bgs. | CLAY |
| 10 | 730 | 6 | 10-12 | 3 6 7 9 | 13 | NA | n/a | NA | | | CLAY as above 7.5-10' bgs but increase Sand to little and decrease Silt to some. | |
| 15 | | | | | | | | | | | | |

**Boring Construction**



- Cement pad with 9" diam. flush-mount cover.
- Grout 0.8-1' bgs.
- Bentonite seal 1-1.5' bgs.
- 2" ID Sch. 40 PVC riser 0.2-2' bgs.
- #5 Global filter sandpack 1.5-12' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 2-12' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
- = Negative Test Result;
Collected sample 2-3.7' bgs.

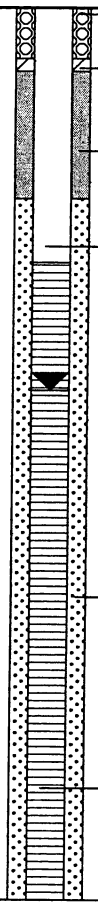
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/18/01 | 5.7' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/18/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 563529.77<br>**Easting:** 13305585.27<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** 741.59<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 740 | 1 | 0-2 | NA NA NA NA | NA | NA | NA | NA | GW | | Coarse angular GRAVEL. No odor, dry, loose. Fill. | GRAVEL |
| | | 2 | 2-4 | 2 4 6 6 | 10 | 1.7 | 440 | - | ML<br>CL | | Very dark gray brown SILT, little fine to medium Sand, few Clay, no odor, damp, loose, aplastic. Mixed with Gravel. Fill.<br>Yellow brown (10 YR 5/6) Silty lean CLAY, little fine to medium subangular Sand, trace to few fine to medium Gravel, no odor, damp, stiff, heavilly oxidized throughout, intermittant patches and lenses of Silt up to 1" wide throughout. | FILL<br>SILTY CLAY |
| 5 | | 3 | 4-6 | 4 5 6 7 | 11 | 1.6 | 151 | - | SP | | Yellow brown (10 YR 5/6) fine to medium subangular poorly graded SAND (predominantly fine below 6' bgs), some Silt, trace Clay, aplastic, no odor, moist, moderately dense. Fill. Gray at 5.6' bgs to lower contact. | SAND |
| | 735 | 4 | 6-8 | 3 2 2 2 | 4 | 1.3 | 221 | - | | | | |
| | | 5 | 8-10 | 3 3 2 3 | 5 | NA | 26.9 | - | CL | | Gray (10 YR 4/1) lean CLAY, some Silt, little to few fine to medium subangular Sand, trace fine to medium rounded to subrounded Gravel, intermittant patches and lenses of Silt, stiff to moderately stiff, no oxidation, no odor, damp. Clay till. Increased stiffness at 11.5' bgs. | CLAY |
| 10 | | 6 | 10-12 | 3 3 2 9 | 5 | 1.5 | 56.9 | - | | | | |
| | 730 | | 12-14 | 3 5 5 5 | 10 | 2 | 18.0 | - | | | | |
| 15 | | | | | | | | | | | | |

**Boring Construction**



- Cement pad with 9" diam. flush-mount cover.
- Grout 0.8-1' bgs.
- Bentonite seal 1-3' bgs.
- 2" ID Sch. 40 PVC riser 0.2-4' bgs.
- #5 Global filter sandpack 3-14' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 4-14' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
- = Negative Test Result; NA = Not Applicable/Not Available.
PID background level = 0.0
Samples collected 2-4' and 4-6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/18/01 | 6.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/29/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Bit Size:**<br>**Auger Size:**<br>**Rig Type:** Geoprobe 66 DT Track Rig<br>**Sampling Method:** 2" diam. + disposable liner<br>**Hammer Weight:** | **Northing:** 563647.26<br>**Easting:** 13305304.38<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** 745.85<br><br>**Geologist:** Shawn Kerr | **Well/Boring ID:** RFI-83/84-03<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36<br>NA=Not Available/Not Applicable. |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0-0.5 | - | NA | NA | | | CONCRETE. | Backfilled with Bentonite to grade |
| | | 2 | 0.5-2 | 1.0 | NA | NA | ✱ | | Brown fine to medium SAND. | |
| | | 3 | 2-4 | 1.4 | NA | NA | | | Light brown fine SAND, moist from 5.7' to 5.9' bgs. | |
| 5 | 5 | 4 | 4-6 | 1.9 | NA | NA | | | | |
| | | 5 | 6-8 | 1.9 | - | NA | | | Brown fine to medium SAND. | |
| | | 6 | 8-10 | 1.9 | - | NA | ✱ | | Dark brown fine to medium SAND, strong odor.<br>Black fine to medium SAND, wet, odor. | |
| 10 | 10 | | | | | | | | Gray CLAY with fine SAND. | |
| | | 7 | 10-12 | 2.0 | - | NA | ✱ | | Black fine to medium SAND, wet. | |
| | | | | | | | | | Gray CLAY, wet. | |
| | | 8 | 12-14 | 1.9 | NA | NA | | | Black fine to medium SAND, saturated.<br>Gray CLAY. | |
| 15 | 15 | | | | NA | NA | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

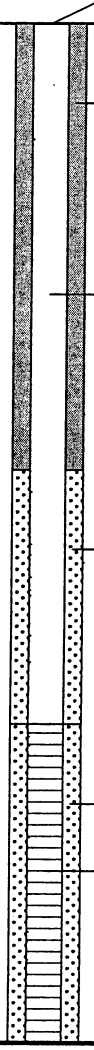
**Remarks:** Samples collected 0-2', 8-10' and 10-12' bgs;
- = Negative Test Result;

PID not functional.

| | | |
|---|---|---|
| **Date Start/Finish:** 1/29/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Bit Size:** NA<br>**Auger Size:** NA<br>**Rig Type:** Geoprobe 66 DT Track Rig<br>**Sampling Method:** 2" acetate sleeve<br>**Hammer Weight:** NA | **Northing:** 564054.78<br>**Easting:** 13305401.44<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 745.65<br><br>**Geologist:** Shawn Kerr | **Well/Boring ID:** RFI-83/84-04<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | 1 | 0-0.7 | - | - | | | | CONCRETE. |
| | | 2 | 0.7-2 | 1.3 | - | | | | |
| | | 3 | 2-4 | 0.5 | - | | | | Brown medium to coarse SAND, some green stuff. |
| 5 | 740 | 4 | 4-6 | 1.3 | + | | | | Dark brown fine SAND, moist.<br>Dark brown coarse SAND with angular chunks.<br>Gray fine SAND, slight odor, moist. |
| | | 5 | 6-8 | 1.5 | + | | | | Gray fine SAND, trace Clay, moist, odor. |
| | | 6 | 8-10 | 1.8 | - | | | | Gray CLAY, trace brown Sand, moist.<br>Dark gray SAND with gray CLAY.<br>Gray CLAY. |
| 10 | 735 | 7 | 10-12 | 1.6 | - | | | | Gray and brown mottled CLAY and SAND.<br>Gray CLAY with SAND, moist.<br>Gray CLAY with fine SAND, saturated. |
| | | 8 | 12-14 | 1.8 | - | | | | Gray CLAY. |
| 15 | 730 | 9 | 14-16 | 1.6 | - | | | | Brown fine SAND with CLAY, saturated.<br>Brown-gray mottled CLAY, saturated. |

Well/Boring Construction




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Samples collected 0-2', 8-10' and 12-14' bgs.
PID not functional.
+/- = Positive/Negative Test Result

**Client:**
General Motors

**Site Location:**
GM-Flint - Focused RFI
Factory 36, Building 36

**Well/Boring ID:** RFI-83/84-04

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Gray-brown CLAY, saturated. | |
| | | 10 | 16-18 | 1.9 | - | | | | Gray CLAY. | |
| 20 | 725 | | | | | | | | | |
| 25 | 720 | | | | | | | | | |
| 30 | 715 | | | | | | | | | |
| 35 | 710 | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** Samples collected 0-2', 8-10' and 12-14' bgs.
PID not functional.
+/- = Positive/Negative Test Result

| | | |
|---|---|---|
| **Date Start/Finish:** 7/24/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Alan Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4' Macrocore w/Acetate sleeves<br>**Auger Size:** NA<br>**Rig Type:** Geoprobe | **Northing:** 563395.78<br>**Easting:** 13305127.82<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** 745.93<br><br>**Descriptions By:** S Kerr | **Boring ID:** RFI-83/84-05<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | | | | | Fill | | CONCRETE. | FILL | |
| | | 1 | 0-2 | 1.1 | 5.3 | NA | ML | | Dark yellowish-brown (10 YR 4/4) SILT, some fine to medium Sand, little fine to medium Gravel, trace Clay, moderately loose, dry, no odor. | SILT | |
| | | 2 | 2-4 | 2.0 | 3.4 | NA | | | Black (10 YR 2/1) SILT, some fine to coarse Sand, trace Clay, trace fine to coarse Gravel, trace metal fragments, moderately loose, dry, no odor. Fill. | | Borehole backfilled with Bentonite to grade. |
| | | | | | | | | | Olive-yellow (25 Y 6/8) SILT, some Clay to 3.7' bgs, then trace Clay, little fine Sand, moderately loose, dry, no odor. | SILT | |
| 5 | 740 | 3 | 4-6 | 1.6 | 19.3 | NA | SM | | Yellow-brown (10 YR 5/6) fine to medium SAND, some Silt, trace Clay, loose, damp, no odor. | SAND | |
| | | 4 | 6-8 | 1.5 | 1.9 | NA | | | | | |
| | | 5 | 8-10 | 1.7 | 10.2 | NA | | | Becomes brown (10 YR 5/3), no clay, wet. | | |
| 10 | 735 | 6 | 10-12 | 2.0 | 0.1 | NA | CL | | Gray (10 YR 5/1) CLAY, medium stiff, highly plastic, damp, no odor. | CLAY | |
| 15 | 730 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Temporary well set at 11' bgs, screened 6-11' bgs.
Samples collected 0.7-2.7' and 6.7-8.7' bgs.

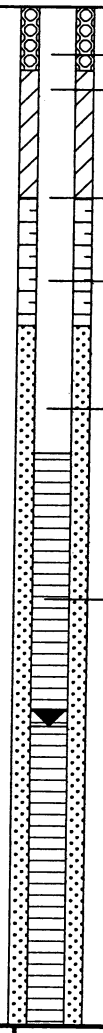
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/24/01 | 9.3' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 9/12/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 564119.47<br>**Easting:** 13305455.03<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 745.58<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-06<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | | | | | | | Fill | | Reinforced CONCRETE with 1/2 - 3/4" OD rebar. | FILL |
| | | 1 | 1-3 | 3 3 2 2 | 5 | 1.4 | 110.8 | + | SM | | Brown (10 YR 5/3) SILTY fine subangular to subrounded SAND, trace Clay, aplastic, no odor, moderately dense, dry. Fill | |
| | | 2 | 3-5 | 4 4 6 7 | 10 | 1.6 | 237 | + | ML | | Brown (10 YR 2/1) SILT, little fine to coarse subangular Sand, trace coarse angular Gravel, some to little Clay, aplastic, no odor, moderately dense to dense, damp, metallic debris and slag also present. Fill. | SILT |
| 5 | 740 | 3 | 5-7 | 4 4 6 6 | 10 | 0.9 | 1554 | + | | | | |
| | | 4 | 7-9 | 13 26 23 16 | 49 | 1.2 | 2332 | + | | | Damp, moderate odor. | |
| 10 | 735 | 5 | 9-11 | 2 2 2 2 | 4 | 1.8 | 2498 | + | CL | | Dark gray (10 YR 4/1) Silty CLAY, little fine to coarse subrounded Sand, trace fine rounded to subrounded Gravel, soft, weak odor, moist. | SAND |
| | | | | | | | | | ML | | Black (10 YR 2/1) SILT, as at 1.9-9.7' bgs. | SILT |
| | | 6 | 11-13 | 19 20 13 12 | 33 | 1.6 | 1956 | + | SP | | Gray-brown (10 YR 5/3) fine to medium subrounded SAND, little Silt, aplastic, strong odor, oily sheen, moderately dense, saturated. | SAND |
| | | 7 | 13-15 | 4 5 7 9 | 12 | 1.7 | 1823 | + | | | | |
| 15 | 730 | 8 | 15-17 | 1 2 | 5 | 2.0 | 754 | + | ML<br>SP | | Yellow-brown (10 YR 5/4) SILT, few fine subangular Sand, little Clay, aplastic, moderate odor, moderately dense to dense, saturated. | |

**Boring Construction**



- Cement pad with 9" diam. flushmount cover
- Grout 1-3' bgs
- 2" ID Sch. 40 PVC riser 0.2-7' bgs
- Bentonite seal 3-5' bgs
- Global filter sand pacdk 5-17' bgs
- 2" ID Sch. 40 PVC 0.010" slotted screen 7-17' bgs

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available.
Permanent well installed 7-17' bgs
Samples collected 1-3', 7-9' and 9-11' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 9/12/01 | 11.3' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-83/84-06

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 15-17 | 3<br>3 | 5 | 2.0 | 754 | + | SP | | Gray-brown (10 YR 5/2) SAND, as at 11.3-15' bgs. Glacial-alluvial. | | 2" ID Sch. 40 PVC 0.010" slotted screen 7-17' bgs |
| | | | | | | | | | CL | | Gray (10 YR 5/1) Silty CLAY, few fine to medium subangular to subrounded Sand, trace fine rounded to subrounded Gravel, stiff, plastic, no odor, damp. | | |
| 20 | 725 | | | | | | | | | | | | |
| 25 | 720 | | | | | | | | | | | | |
| 30 | 715 | | | | | | | | | | | | |
| 35 | 710 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; + = Positive Test Result
NA = Not Applicable/Not Available.
Permanent well installed 7-17' bgs
Samples collected 1-3', 7-9' and 9-11' bgs.

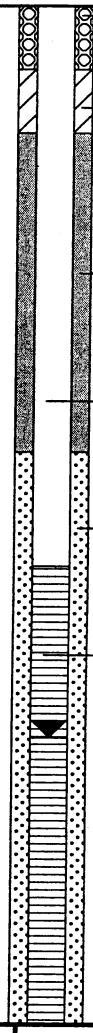
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 9/12/01 | 11.3' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/25/01 - 8/1/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Alan Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 45B | **Northing:** 564580.43<br>**Easting:** 13305269.82<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 746.56<br><br>**Descriptions By:** S Kerr | **Boring ID:** RFI-83/84-07<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | Fill | | CONCRETE | FILL |
| | 745 | 1 | 1-3 | 1 3 5 6 | 8 | 1.1 | 4.0 | - | SP | | Pale brown (10 YR 6/3) SAND, some Silt, aplastic, loose, dry, no odor. Fill<br>Dark brown (10 YR 3/3) 2.3-2.8' bgs. | SAND |
| | | 2 | 3-5 | 3 9 8 10 | 17 | 1.0 | 16.4 | - | | | Dark brown (10 YR 3/3) 4-4.3' bgs. | |
| 5 | | 3 | 5-7 | 7 9 16 19 | 25 | 1.5 | 10.4 | + | | | Very dark gray-brown (10 YR 3/2) fine to medium SAND, some Silt, trace Clay, trace fine to coarse angular to subangular Gravel, trace Slag, some oxidation, aplastic, loose, dry, no odor. Fill | |
| | 740 | 4 | 7-9 | 7 5 4 8 | 9 | 1.6 | 7.9 | + | ML | | Very dark gray-brown (10 YR 3/2) SILT, some to trace Clay, some fine to coarse Sand, little fine to coarse Gravel and Slag, aplastic, moderately loose, dry, no odor. Fill<br>Yellow-brown (10 YR 5/6) SILT, little Clay, trace fine Sand, aplastic, moderately dense, no odor, damp. Very dark gray (10 YR 3/1), trace coarse subangular to subrounded Gravel from 8-8.7' bgs. | SILT<br>SILT |
| 10 | | 5 | 9-11 | 4 10 8 10 | 18 | 1.4 | 11.1 | + | SP | | Yellow-brown (10 YR 5/6) fine to medium SAND, some Silt, trace Clay, aplastic, moderately loose, moist, no odor. | SAND |
| | 735 | 6 | 11-13 | 7 11 14 14 | 25 | 1.5 | 3.6 | + | SW | | Gray-brown (10 YR 5/2) fine to medium SAND, loose, moderate odor, oily appearance, saturated. at 11.8': All fine SAND, little Silt, some black staining, moderately dense. | |
| 15 | | 7 | 13-15 | 7 8 10 12 | 18 | 1.6 | 0.0 | + | ML | | Gray (10 YR 5/1) SILT, moderately dense, no odor, saturated. | SILT |
| | | 8 | 15-17 | 8 9 | 19 | 1.7 | 0.0 | NA | | | | |

**Boring Construction**



- Cement pad with 7" diam. flush-mount cover.
- Grout 1-2' bgs.
- Hydrated bentonite seal 2-7' bgs.
- 2" ID Sch. 40 PVC riser 0.2-8.8' bgs.
- #5 Global filter sandpack 7-19' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 8.8-18.8' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs=below ground surface;
+/- =Positive/Negative Test Result;
NA = Not Applicable/Not Available;
Samples collected 0.9-2.9' and 8.9-10.9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/25/01 | 11.5' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-83/84-07

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | 8 | 15-17 | 10 12 | 19 | 1.7 | 0.0 | NA | ML | | Gray (10 YR 5/1) SILT, moderately dense, no odor, saturated. | SILT | |
| | | 9 | 17-19 | 11 14 24 26 | 38 | 1.6 | 0.0 | NA | | | | | #5 Global filter sandpack 7-19' bgs. 2" ID Sch. 40 PVC 0.010" slotted screen 8.8-18.8' bgs. |
| 20 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs=below ground surface;
+/- =Positive/Negative Test Result;
NA = Not Applicable/Not Available;
Samples collected 0.9-2.9' and 8.9-10.9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/25/01 | 11.5' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/24/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Alan Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4' Macrocore w/Acetate sleeves<br>**Auger Size:**<br>**Rig Type:** Geoprobe | **Northing:** 564688.86<br>**Easting:** 13305203.22<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** 746.73<br><br>**Descriptions By:** S Kerr | **Boring ID:** RFI-83/84-08<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | Fill | | CONCRETE. | FILL | |
| | 745 | 1 | 0-2 | 0.5 | 2.0 | - | ML | | Black (10 YR 2/1) SILT, some fine Sand, trace Clay, loose, dry, no odor. (Fill - foundry sand) | SILT | Borehole backfilled with Bentonite to grade. |
| | | 2 | 2-4 | 1.1 | 14.2 | - | | | | | |
| 5 | | 3 | 4-6 | 2.0 | 6.8 | - | SP | | Brown (10 YR 4/3) fine to medium SAND, trace Clay and wood debris, moderately loose, dry, slight odor. | SAND | |
| | 740 | 4 | 6-8 | 1.8 | 14.5 | - | ML | | Silt, as at 0.7-4.3' bgs, with increased Clay content and little fine to coarse Gravel. | SILT | |
| | | 5 | 8-10 | 1.6 | 15.0 | - | CL | | Dark grayish-brown (10 YR 4/2) CLAY, little Silt, trace fine to coarse Sand, stiff, slight odor, dry.<br>Increased Silt content. | CLAY | |
| 10 | | | | | | | CL | | Grayish-brown (10 YR 5/3) fine to coarse Sandy CLAY, moist, no odor. | | |
| | 735 | 6 | 10-12 | 1.5 | 9.0 | - | SP | | Grayish-brown (10 YR 5/2) fine to medium SAND, little Silt, wet, no odor. | SAND | |
| | | 7 | 12-14 | 2.0 | 4.9 | - | | | | | |
| 15 | | 8 | 14-16 | 2.0 | 0.2 | - | ML | | Gray (10 YR 5/1) SILT, trace Clay, trace fine Sand, dense, wet, no odor. | SILT | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; - = Negative Test Result;
NA = Not Applicable/Not Available;
Temporary well set at 19' bgs, screened 9-19' bgs;
Samples collected 0.7-2.7' and 8.7-10.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/24/01 | 12' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-83/84-08

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | 9 | 16-18 | 1.6 | 4.2 | - | ML | | Gray (10 YR 5/1) SILT, trace Clay, trace fine Sand, dense, wet, no odor. | SILT | Borehole backfilled with Bentonite to grade. |
| | | 10 | 18-20 | 1.8 | 9.2 | - | | | Auger refusal in dense silt. | | |
| 20 | | | | | | | | | | | |
| | 725 | | | | | | | | | | |
| 25 | | | | | | | | | | | |
| | 720 | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| | 715 | | | | | | | | | | |
| 35 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; - = Negative Test Result;
NA = Not Applicable/Not Available;
Temporary well set at 19' bgs, screened 9-19' bgs;
Samples collected 0.7-2.7' and 8.7-10.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/24/01 | 12' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/23/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Alan Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4' Macrocore w/Acetate sleeves<br>**Auger Size:** NA<br>**Rig Type:** Truck-mounted Geoprobe | **Northing:** 564185.83<br>**Easting:** 13305103.89<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 746.87<br><br>**Descriptions By:** S Kerr | **Boring ID:** RFI-83/84-09<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | Fill | | CONCRETE. | FILL | |
| | 745 | 1 | 1-3 | 1.3 | 2.7 | + | ML | | Brown (10 YR 5/3) SILT, some fine to medium Sand, trace Clay, loose, dry, no odor. | SILT | Borehole backfilled with Bentonite to grade. |
| | | 2 | 3-5 | 2.0 | 8.5 | + | CL | | Gray (10 YR 5/1) CLAY, mottled with 10 YR 5/2, trace Silt, little fine to medium Sand, soft, plastic, slight odor. At 3.7': some Sand, moist. | CLAY | |
| | | | | | | | SP | | Light brown-gray (10 YR 6/2) fine to medium SAND, loose, moist, slight odor. | | |
| 5 | | 3 | 5-7 | 2.0 | 11.8 | + | ML | | Light brown-gray (10 YR 6/7) SILT, trace fine Sand, moderately loose, moist, slight odor. | SILT | |
| | 740 | 4 | 7-9 | 2.0 | 5.4 | + | CL | | Gray (10 YR 5/1) CLAY, some fine to medium Sand, some Silt, plastic, strong odor, wet. | CLAY | |
| 10 | | 5 | 9-11 | 1.5 | 5.4 | + | | | Gray (10 YR 5/1) fine to coarse SAND, loose, saturated, slight odor. | | |
| | | | | | | | SP | | Gray (10 YR 5/1) CLAY (CL), medium stiff, plastic, slight odor. | | |
| | | | | | | | | | SAND, as at 9.9-10.1' bgs. | | |
| | | | | | | | CL | | CLAY, as at 10.1-10.3' bgs. | CLAY | |
| | 735 | 6 | 11-13 | 2.0 | 5.7 | + | ML | | Gray (10 YR 5/1) SILT, some fine Sand, slight odor, saturated. | | |
| | | | | | | | SP | | Gray (10 YR 5/1) fine to coarse SAND, some oxidation, loose, slight odor, saturated. | SAND | |
| | | 7 | 13-15 | 1.4 | 2.5 | + | | | Gray (10 YR 5/6) to yellow-brown SAND. | | |
| 15 | | 8 | 15-17 | NA | 3.7 | - | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs=below ground surface;
+/- =Positive/Negative Test Result;
NA = Not Applicable/Not Available;
Temporary well screened 8-18' bgs;
Samples collected 0.8-2.8' and 6.8-8.8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/23/01 | 9.9' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-83/84-09

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | 8 | 15-17 | NA | 3.7 | - | SP | | Gray (10 YR 5/6) to yellow-brown SAND. | SAND | |
| | | 9 | 17-19 | NA | 0.0 | + | CL | | Sample liner stuck: Gray (10 YR 5/1) CLAY, trace Silt, soft, highly plastic, no odor. | ← CLAY → | Borehole backfilled with Bentonite to grade. |
| 20 | | | | | | | | | | | |
| | 725 | | | | | | | | | | |
| 25 | | | | | | | | | | | |
| | 720 | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| | 715 | | | | | | | | | | |
| 35 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs=below ground surface;
+/- =Positive/Negative Test Result;
NA = Not Applicable/Not Available;
Temporary well screened 8-18' bgs;
Samples collected 0.8-2.8' and 6.8-8.8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/23/01 | 9.9' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/29/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Bit Size:**<br>**Auger Size:**<br>**Rig Type:** Geoprobe 66 DT Track Rig<br>**Sampling Method:** 2" diam. + disposable liner<br>**Hammer Weight:** | **Northing:** 564026.81<br>**Easting:** 13305237.73<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** 745.82<br><br>**Geologist:** Shawn Kerr | **Well/Boring ID:** RFI-83/84-10<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Focused RFI<br>Factory 36, Building 36 |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Oil/Water Shake Test | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 1 | 0-0.5 | - | - | NA | | | CONCRETE. | Backfilled with Bentonite to grade |
| | 745 | 2 | 0.5-2 | 0.9 | - | NA | ✱ | | Brown fine to medium SAND.<br>Dark brown fine to medium SAND, trace Clay and large Gravel. | |
| | | 3 | 2-4 | 1.4 | - | NA | | | Dark brown medium SAND with GRAVEL and BRICK chunks.<br>Brown fine to medium SAND. | |
| 5 | 740 | 4 | 4-6 | 1.8 | - | NA | | | Light brown fine SAND.<br>Gray CLAY with brown fine to medium SAND, moist from 5.1' to 5.3' bgs. | |
| | | 5 | 6-8 | 1.6 | - | NA | | | Brown fine SAND, trace Clay.<br>BRICK chunks.<br>Light brown fine to medium SAND.<br>Gray CLAY with light brown fine to medium SAND. | |
| | | 6 | 8-10 | 1.2 | - | NA | ✱ | | Brown fine to medium SAND.<br>BRICK chunks.<br>Light brown fine to medium SAND.<br>Gray fine to medium SAND, odor, moist. | |
| 10 | 735 | 7 | 10-12 | 2.0 | - | NA | ✱ | | As above, trace coarse Sand, moist.<br>Brown fine to medium SAND, moist. | |
| | | 8 | 12-14 | 1.4 | - | NA | | | Brown fine SAND, saturated.<br>Gray CLAY. | |
| 15 | 730 | 9 | | | - | NA | | | | |

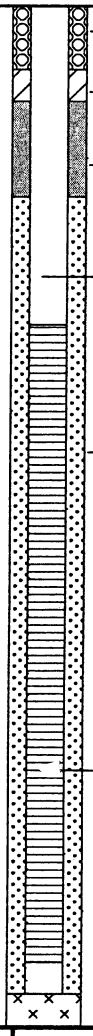
BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Samples collected 0-2', 8-10' and 10-12' bgs.
PID not functional.
- = Negative Test Result.

| | | |
|---|---|---|
| **Date Start/Finish:** 6/25/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 45B | **Northing:** 564480.05<br>**Easting:** 13305564.35<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 22' bgs<br>**Surface Elevation:** 741.61<br><br>**Descriptions By:** SM Dully | **Boring ID:** RFI-83/84-11<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 1 | 0-2 | 4 8 7 20 | 15 | 1.0 | 363 | - | ML | | Dark grayish brown (10YR 1/2) aplastic SILT, little fine to coarse subangular Sand with increased roundness, little fine to coarse angular rubble predominated fossilferous limestone Gravel, trace Clay, roots, damp, moderate loose, earthy odor (Topsoil and Fill). | SILT |
| | 740 | | | | | | | | SP | | Brown (10YR 4/3) aplastic fine to coarse subangular to subrounded SAND, little fine to medium rounded to subrounded Gravel, little Silt, damp, moderate dense, no odor. | SAND |
| | | | | | | | | | FL | | Concrete rubbles. | FILL |
| | | 2 | 2-4 | 6 5 3 3 | 8 | 1.8 | 87.2 | - | SP | | Brown (10YR 4/3) aplastic fine to coarse subangular to subrounded SAND. | SAND |
| | | | | | | | | | ML | | Dark yellow brown (10YR 1/6) SILT and fine to medium subangular to subrounded Silty SAND (predominantly fine grained and subangular), trace Clay, 2" wide lense of black (10YR 2/1) angular slag at 2.5' bgs, damp, moderately dense, no odor. Fill. | SILT |
| 5 | | 3 | 4-6 | 4 5 7 9 | 12 | 2.0 | 1039 | - | SM | | Yellow brown (10YR 5/6) aplastic Silty SAND abd fine subangular SAND, damp, dense, locally oxidized dark yellow brown (10YR 5/6) at 7.5' bgs, no odor, moist to wet at 6.5' bgs, saturated at 7' bgs, faint hydrocarbon odor and light oily sheen from 7.6' to 10.5' bgs, color turns to dark gray (10YR 4/1) at 10.5' bgs and to gray (10YR 5/1) at 13.5' bgs. | SILTY SAND |
| | 735 | 4 | 6-8 | 3 4 4 4 | 8 | 1.5 | 2090 | + | | | | |
| | | 5 | 8-10 | 3 4 5 8 | 9 | 2.0 | 941 | + | | | | |
| 10 | | 6 | 10-12 | 3 4 7 7 | 11 | 2.0 | 148 | + | | | | |
| | 730 | 7 | 12-14 | 3 4 7 8 | 11 | 1.8 | 22.7 | + | | | | |
| 15 | | 8 | 14-16 | 3 4 7 9 | 11 | 1.5 | 3.3 | + | | | | |

**Boring Construction**



- Cement pad with 9" diam. flush-mount cover.
- Grout 1-1.5' bgs.
- Bentonite seal 1.5-3' bgs.
- 2" ID Sch. 40 PVC riser 0.2-5' bgs.
- #5 Global filter sandpack 3-15.5' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 5-15' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
+/- = Positive/Negative Test Result.
Samples collected 0-2' and 4-6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/25/01 | 7.0 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-83/84-11

**Borehole Depth:** 22' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 725 | 9 | 16-18 | 3 4 6 7 | 10 | 1.5 | 7.3 | - | SM | | Yellow brown (10YR 5/6) aplastic Silty SAND abd fine subangular SAND, damp, dense, locally oxidized dark yellow brown (10YR 5/6) at 7.5' bgs, no odor, moist to wet at 6.5' bgs, saturated at 7' bgs, faint hydrocarbon odor and light oily sheen from 7.6' to 10.5' bgs, color turns to dark gray (10YR 4/1) at 10.5' bgs and to gray (10YR 5/1) at 13.5' bgs. | SILTY SAND | Natural collapse 15.5-22' bgs. |
| | | 10 | 18-20 | 4 6 4 8 | 10 | 1.5 | 8.4 | - | ML | | Gray (10YR 5/1) aplastic SILT, little to few Clay, saturated, no odor, dense (alluvial/river silt). | SILT | |
| 20 | | 11 | 20-22 | 4 6 9 7 | 15 | 1.6 | 2.8 | - | | | | | |
| | 720 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 710 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
+/- = Positive/Negative Test Result.
Samples collected 0-2' and 4-6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/25/01 | 7.0 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/17/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4' x 2" ID Acetate Sleeve<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 564079.83<br>**Easting:** 13305401.47<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 4.7' bgs<br>**Surface Elevation:** 745.80<br><br>**Descriptions By:** SM Dully | **Boring ID:** RFI-83/84-12<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | | | | | FL | | Reinforced CONCRETE. | Fill | |
| | | 1 | 0.7-2.7 | 3.6 | 0.0 | + | SM | | Black (10YR 2/1) Silty fine to coarse subangular to angular SAND, little Clay, well graded, weak odor, moderately dense, aplastic, damp. Fill/Foundry Sand. | | Borehole backfilled with bentonite to grade. |
| | | 2 | 2.7-4.7 | NA | 0.0 | + | | | | | |
| 5 | 740 | | | | | | | | | | |
| 10 | 735 | | | | | | | | | | |
| 15 | 730 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.7-2.7' and 2.7-4.7' bgs.
+ = Positive Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/07/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4'x2" ID acetate sleeve<br>**Auger Size:** NA<br>**Rig Type:** Mule Mounted Geoprobe | **Northing:** 564055.89<br>**Easting:** 13305429.74<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 7' bgs<br>**Surface Elevation:** 745.72<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-13<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | | | | | FL | | Concrete. | FILL | |
| | | 1 | 1-3 | 2 | 0.0 | - | SM | | Brown (10 YR 2/1) aplastic, subangular, Silty fine to medium, poorly graded SAND, little clay, no odor, dry, moderately dense. Foundry Sand. | | |
| | | | | | | | SW | | Yellow brown, (10 YR 5/4) aplastic, well graded subangular SAND, little Silt, locally semi-lithified, dry, dense, no odor. Fill. | SAND | Borehole backfilled with bentonite to grade. |
| | | | | | | | SM | | Reddish-brown, aplastic well graded, subangular to angular SAND, little Silt, little Clay, semi-lithified, no odor, dry, dense. Fill. | | |
| | | 2 | 3-5 | 1.3 | 0.0 | - | SM | | Yellow brown (10 YR 5/4) aplastic, poorly graded subangular Silty SAND, few Clay, no odor, dense, damp. | | |
| | | | | | | | | | Concrete | | |
| 5 | | | | | | | | | Brown (10YR 4/3) aplastic Silty subangular to subrounded well graded, SAND, little Clay, moist to damp, dense, no odor, Slag framents present. Fill. | SILTY SAND | |
| | 740 | 3 | 5-7 | NA | NA | - | FL | | Concrete debris | FILL | |
| | | | | | | | SM | | Brown (10YR 4/3) aplastic Silty subangular to subrounded well graded, SAND, little Clay, moist to damp, dense, no odor, Slag framents present. Fill. | | |
| 10 | 735 | | | | | | | | Borehole terminated at 7.0' | | |
| 15 | 730 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available; - = Negative Test Result;
Set temporary well screen 1-6' bgs.
Sample collected 0.8-1' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/10/01<br>**Drilling Company:** RAU<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4' x 2" ID Acetate Sleeves<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 564039.91<br>**Easting:** 13305401.46<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 2' bgs<br>**Surface Elevation:** 745.74<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-14<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | FL | | Reinforced CONCRETE. | Fill | Borehole backfilled with bentonite to grade. |
| | | 1 | 0.8-2.0 | 0.0 | NA | NA | SM<br>FL | | Black (10YR2/1) Silty SAND, fine to coarse subangular Sand, few Clay, few fine to medium angular Gravel, no odor, loose, aplastic, dry. Fill/Foundry Sand.<br>Black Wood debris. Refusal. | | |
| 5 | 5 | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0.8-1' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/10/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4' x 2" ID Acetate Sleeves<br>**Auger Size:**<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 564051.79<br>**Easting:** 13305369.15<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 3' bgs<br>**Surface Elevation:** 745.72<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-15<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | | | | | FL | | Reinforced CONCRETE. | FILL | Borehole backfilled with bentonite to grade. |
| | | 1 | 1.2-3.0 | NA | NA | NA | SM | | Black 10YR2/1 Silty fine to coarsesubangular well graded SAND, few Clay, few medium to coarse angular Gravel, no odor, moderately dense to loose, aplastic, dry. Fill/Foundry Sand. | SILTY SAND | |
| 5 | 740 | | | | | | | | | | |
| 10 | 735 | | | | | | | | | | |
| 15 | 730 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 1.2-3' bgs.
NA

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/10/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4' x 2" ID Acetate Sleeves<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 563424.53<br>**Easting:** 13305126.79<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 4.8' bgs<br>**Surface Elevation:** 745.69<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-16<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | | | | | | | FL | | Reinforced CONCRETE. | | |
| | | 1 | 0.8-2.8 | NA | NA | NA | NA | NA | SW | | Yellow-brown 10YR 5/4 well graded fine to coarse subangular to angular SAND, little Silt, trace Clay, no odor, dense, aplastic, dry, locally semi-lithified. | SAND | Borehole backfilled with bentonite to grade. |
| | | | | | | | | | | | Black (10YR 2/1) well graded fine to coarse subangular SAND and possible SLAG, some Silt, no odor, dense, aplastic, dry. | | |
| | | | 2.8-4.8 | NA | NA | NA | NA | NA | ML | | Yellow-brown (10YR 5/4) SILT, little fine to medium subrounded to rounded Sand, with decreasing Sand content with depth, little to some Clay, no odor, dense, aplastic, damp. Fill. | SILT | |
| 5 | 740 | | | | | | | | | | | | |
| 10 | 735 | | | | | | | | | | | | |
| 15 | 730 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0.8-2.8' and 2.8-4.8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/10/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4' x 2" ID Acetate Sleeves<br>**Auger Size:**<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 563395.73<br>**Easting:** 13305151.83<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 1.4' bgs<br>**Surface Elevation:** 745.56<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-17<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | NA | NA | NA | NA | NA | NA | FL | | Reinforced CONCRETE. | Fill | Borehole backfilled with bentonite to grade. |
| 5 | 740 | | | | | | | | | | | | |
| 10 | 735 | | | | | | | | | | | | |
| 15 | 730 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/10/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4' x 2" ID Acetate Sleeves<br>**Auger Size:**<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 563368.86<br>**Easting:** 13305129.14<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 4.8' bgs<br>**Surface Elevation:** 745.61<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-18<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | | | | | | | FL | | Reinforced CONCRETE. | | |
| | | 1 | 0.8-2.8 | NA | NA | 1.6 | NA | NA | ML | | Brown-yellow (10YR 6/6) SILT, some fine poorly graded subangular Sand, few fine to coarse angular Gravel and rubble, no odor, dense, aplastic, dry. Fill. | SILT | Borehole backfilled with bentonite (0-4.8' bgs). |
| | | | NA | NA | NA | NA | NA | NA | SM | | Black (10YR 2/1) Silty SAND, fine to coarse subangular well graded Sand, few fine to coarse angular Gravel, few Clay, no odor, dense, aplastic, dry. Locally semi-lithified. Fill/Foundry Sand. | | |
| | | | | | | | | | ML | | Brown-yellow (10YR 6/6) SILT, some fine poorly graded subangular Sand, few fine to coarse angular Gravel and rubble, no odor, dense, aplastic, dry. Fill. | SILT | |
| 5 | 740 | | | | | | | | | | | | |
| 10 | 735 | | | | | | | | | | | | |
| 15 | 730 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 0.8-2.8' and 2.8-4.8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/10/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4' x 2" ID Acetate Sleeves<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 563397.98<br>**Easting:** 13305103.94<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 3.4' bgs<br>**Surface Elevation:** 745.70<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-19<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | | | | | | | FL | | Reinforced CONCRETE. | | |
| | | 1 | 0.8-2.8 | NA | NA | 1.6 | NA | NA | SM | | Brown (10YR 5/3) Silty SAND, fine to medium subangular to subrounded, well graded Sand, few Clay, no odor, dense, aplastic, dry. Fill.<br><br>Black (10YR 2/1) poorly graded fine subangular Silty SAND, few Clay, no odor, dense, aplastic, dry. Fill.<br><br>Silty SAND as at 0.8' bgs. | SILTY SAND | Borehole backfilled with bentonite to grade. |
| | | | | | | | | | | | Refusal at 3.4' bgs. | | |
| 5 | 740 | | | | | | | | | | | | |
| 10 | 735 | | | | | | | | | | | | |
| 15 | 730 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.8-2.8' and 2.8-3.4' bgs.

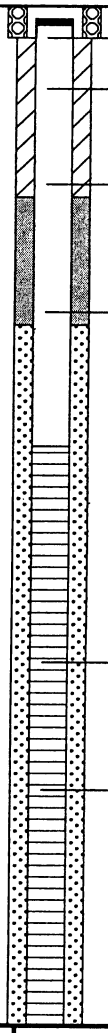
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/28/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:**<br>**Auger Size:** 4' x 4" ID<br>**Rig Type:** CME 45B | **Northing:** 563395.99<br>**Easting:** 13305127.17<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 745.24<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-20<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | | | | | | | Fill | | CONCRETE. | FILL |
| | | 1 | 0-2 | NA | NA | 1.1 | 5.3 | NA | ML | | Dark yellowish-brown (10 YR 4/4) SILT, some fine to medium Sand, little fine to medium Gravel, trace Clay, moderately loose, dry, no odor. Fill. | SILT |
| | | 2 | 2-4 | NA | NA | 2.0 | 3.4 | NA | | | Black (10 YR 2/1) SILT, some fine to coarse Sand, trace Clay, trace fine to coarse Gravel, trace metal fragments, moderately loose, dry, no odor. Fill. | |
| | | | | | | | | | | | Olive-yellow (25 Y 6/8) SILT, some Clay to 3.7' bgs, then trace Clay, little fine Sand, moderately loose, dry, no odor. | |
| 5 | 740 | 3 | 4-6 | NA | NA | 1.6 | 19.3 | NA | SM | | Yellow-brown (10 YR 5/6) fine to medium SAND, some Silt, trace Clay, loose, damp, no odor. | SAND |
| | | 4 | 6-8 | NA | NA | 1.5 | 1.9 | NA | | | | |
| | | 5 | 8-10 | NA | NA | 1.7 | 10.2 | NA | | | Becomes brown (10 YR 5/3), no clay, wet. | |
| 10 | 735 | 6 | 10-12 | NA | NA | 2.0 | 0.1 | NA | CL | | Gray (10 YR 5/1) CLAY, medium stiff, highly plastic, damp, no odor. | CLAY |
| | | NA | 12-17 | NA | NA | NA | NA | - | NA | | Blind drilled to 17' bgs. Cuttings have no odor and are negative for shake test. | |
| 15 | 730 | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; - = Negative Test Result
NA = Not Applicable/Not Available.
Boring was blind drilled to target depth. Stratigraphy and sampling information to 12' bgs from RFI-83/84-05.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-83/84-20

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NA | 12-17 | NA | NA | NA | NA | - | NA | | Blind drilled to 17' bgs. Cuttings have no odor and are negative for shake test. | | PVC Cap |
| 20 | 725 | | | | | | | | | | | | |
| 25 | 720 | | | | | | | | | | | | |
| 30 | 715 | | | | | | | | | | | | |
| 35 | 710 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; - = Negative Test Result
NA = Not Applicable/Not Available.
Boring was blind drilled to target depth. Stratigraphy and sampling information to 12' bgs from RFI-83/84-05.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/10/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4' x 2" ID Acetate Sleeves<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 564147.11<br>**Easting:** 13305455.07<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** 746.01<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-21<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | Reinforced CONCRETE. | FO:: | |
| | | 1 | 0.7-2.7 | NA | NA | 1.2 | 7.0 | - | ML | | Black (10YR 2/1) SILT, some fine poorly graded subangular Sand, few Clay, no odor, moderately dense, aplastic, dry. Foundry Silt/Sand. | SILT | Borehole backfilled with bentonite to grade. |
| | | 2 | 2.7-4.7 | NA | NA | NA | 0.0 | - | CL | | Black (10YR 2/1) Silty Lean CLAY, little fine to coarse subangular Sand, no odor, moderately stiff, aplastic to moderately plastic, dry. | CLAY | |
| 5 | 5 | 3 | 4.7-6.7 | NA | NA | 0.6 | 0.0 | + | | | | | |
| | | 4 | 6.7-8.7 | NA | NA | 1.0 | 40.5 | + | SM | | Black (10YR 2/1) Silty SAND, fine to coarse angular to subangular well graded Sand, occasional Concrete debris, no odor, moderately dense, aplastic, dry. Foundry Sand. | SILTY SAND | |
| | | 5 | 8.7-10 | NA | NA | NA | 170 | + | ML | | Black (10YR 2/1) becoming dark gray-brown (10YR 4/2) at 9.5' bgs SILT, some Clay, little fine to medium subangular Sand, moderate odor, dense, aplastic, damp. | SILT | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Samples collected 0.7-2.7' and 6.7-8.7' bgs.
+/-=Positive/Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/10/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4' x 2" ID Acetate Sleeves<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 564090.50<br>**Easting:** 13305457.06<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** 745.79<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-22<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | | | | | | | FL | | Reinforced CONCRETE. | FILL | |
| | | 1 | 1-3 | NA | NA | 1.8 | 98.8 | - | SM | | Black (10YR 2/1) Silty SAND, fine to coarse predominantly fine subangular well graded Sand, little Clay, occasional Concrete debris from 1 to 4' bgs, no odor, moderately dense to dense, aplastic, dry. Foundry Sand/Fill. | SILTY SAND | Borehole backfilled with bentonite to grade. |
| | | 2 | 3-5 | NA | NA | 1.5 | 92.4 | - | | | Occasional lenses and patches of yellow-brown (10YR 5/4) fine Sand (SP), up to 2" thick. | | |
| 5 | 740 | 3 | 5-7 | NA | NA | NA | 19.3 | - | | | Yellow-brown (10YR 5/4) Silty SAND, fine subangular poorly graded Sand, few Clay, no odor, dense, aplastic, dry. Fill Sand. | | |
| | | 4 | 7-9 | NA | NA | 1.8 | 80.5 | + | ML | | Black (10YR 2/1) SILT, little to some Clay, few fine subangular Sand, no odor, dense, aplastic, damp. Concrete debris in the first 1" at upper contact. Fill/Backfill. | SILT | |
| | | 5 | 9-10 | NA | NA | NA | 62.7 | + | | | Gray (10YR 5/1) SILT, some Clay, few fine subangular Sand, moderate odor, dense, aplastic, damp, oily sheen present. | | |
| 10 | 735 | | | | | | | | | | | | |
| 15 | 730 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Samples collected 1.1-3.1', 3.1-5.1' and 7.1-9.1' bgs.
+/- = Positive/Negative Shake Test.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/10/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 564119.74<br>**Easting:** 13305478.14<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 7.2' bgs<br>**Surface Elevation:** 745.93<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-23<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | | | | | | | FL | | Reinforced CONCRETE. | | |
| | | 1 | 1-3 | NA | NA | 2 | 4.3 | - | SP | | Pale brown (10YR 6/3) poorly graded fine subangular SAND, some Silt, few to trace Clay, occasionally varved with black Silt (especially 1-2' bgs), no odor, moderately dense, aplastic, dry. Fill. | SAND | Borehole backfilled with bentonite to grade. |
| | | 2 | 3-5 | NA | NA | 1.5 | 2.5 | - | SM | | Black (10YR 2/1) Silty SAND, well graded fine to coarse subangular to angular Sand, little Clay, no odor, moderately dense to dense, aplastic, damp. Fill/Foundry Sand. | SILTY SAND | |
| 5 | 740 | 3 | 5-7 | NA | NA | NA | 30.3 | + | | | | | |
| | | 4 | 7-7.2 | NA | NA | 0.1 | 8.2 | + | | | Becomes moist with an oily sheen and moderate odor present. | | |
| | | | | | | | | | | | Subsurface concrete. | | |
| 10 | 735 | | | | | | | | | | | | |
| 15 | 730 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Samples collected 1-3' and 5-7' bgs.
+/- = Positive/Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/10/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4 x 2" ID Acetate Sleeves<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 564119.65<br>**Easting:** 13305431.49<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** 745.94<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-24<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | | | | | | | FL | | Reinforced CONCRETE. | FILL | |
| | | 1 | 0.8-2.8 | NA | NA | 1.9 | 18.6 | - | SW | | Yellow-brown (10YR 5/4) fine to medium subangular well graded SAND, some to little Silt, no odor, dense, dry. Fill Sand. | SAND | Borehole backfilled with bentonite to grade. |
| | | 2 | 2.8-4.8 | NA | NA | NA | 117 | + | SM<br>CL | | Black (10YR 2/1) Silty SAND, fine to coarse well graded subangular to angular Sand, little to some Clay, no odor, moderately dense, aplastic, dry. Foundry Sand.<br>Black (10YR 2/1) Silty Lean CLAY, little fine to medium subangular Sand, no odor, moderately stiff to stiff, moderately plastic, dry. Clay Till. | SILTY CLAY | |
| 5 | 740 | 3 | 4.8-6.8 | NA | NA | 1.9 | 228 | + | SW<br>FL<br>SM | | Yellow-brown (10YR 5/4) fine to medium subangular well graded SAND, some to little Silt, no odor, dense, dry. Fill Sand.<br>Cement DEBRIS.<br>Black (10YR 2/1) Silty SAND, fine to coarse well graded subangular to angular Sand, little to some Clay, no odor, moderately dense, aplastic, dry. Foundry Sand. | SILTY SAND | |
| | | 4 | 6.8-8.8 | NA | NA | 1.6 | 155 | + | SW<br>SM<br>CL | | Yellow-brown (10YR 5/4) fine to medium subangular well graded SAND, some to little Silt, no odor, dense, dry. Fill Sand. | | |
| | | 5 | 8.8-10 | NA | NA | NA | 182 | + | ML | | Black (10YR 2/1) Silty SAND, fine to coarse well graded subangular to angular Sand, little to some Clay, no odor, moderately dense, aplastic, dry. Foundry Sand.<br>Black (10YR 2/1) Silty Lean CLAY, little fine to medium subangular Sand, no odor, moderately stiff to stiff, moderately plastic, dry. Clay Till.<br>Gray-brown (10YR 5/2) SILT, some fine subangular poorly graded Sand, little Clay, moderate to weak odor, dense, aplastic, damp. Fill. | SILT | |
| 10 | 735 | | | | | | | | | | | | |
| 15 | 730 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected at 0.8-2.8', 4.8-6.8', and 6.8-8.8' bgs.
+/- = Positive/Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/05/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME55 | **Northing:** 564104.84<br>**Easting:** 13305504.31<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** 745.83<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-25<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | CONCRETE. | FILL |
| | | 1 | 0-2 | 4 5 6 7 | 11 | 1.3 | 0.0 | - | SM | | Black (10YR 2/1) fine to medium subangular Silty SAND, little to few Clay, poorly graded, no odor, moderately dense, aplastic, dry. Foundry Sand/Fill. | SILTY SAND |
| | | 2 | 2-4 | 4 5 7 7 | 12 | 1.2 | 0.0 | - | | | | |
| 5 | 5 | 3 | 4-6 | 2 3 2 2 | 5 | 1.2 | 0.0 | - | | | Becomes very dark gray-brown (10YR 3/2). Fine to coarse gravel-size Slag present. | |
| | | 4 | 6-8 | 5 11 7 9 | 18 | 1.5 | 0.0 | - | | | | |
| | | | | | | | | | ML | | Dark yellow-brown (10YR 4/4) SILT, some to little Clay, few fine subangular Sand, rare coarse rounded Gravel, no odor, dense, aplastic, dry. Till. | SILT |
| | | 5 | 8-10 | 4 6 9 10 | 15 | 2.0 | 0.0 | - | SM | | Yellow-brown (10YR 5/4) fine subangular Silty SAND, trace to few Clay, poorly graded, no odor, dense, aplastic, dry. | SILTY SAND |
| 10 | 10 | 6 | 10-12 | 3 10 10 10 | 20 | 1.6 | 0.0 | - | | | Damp.<br>Moist to wet.<br>Saturated. | |
| | | 7 | 12-14 | 10 16 16 15 | 32 | 1.7 | 0.0 | - | | | | |
| 15 | 15 | 8 | 14-16 | 9 10 13 12 | 23 | 1.4 | 0.0 | - | | | | |
| | | | | | | | | | ML | | Gray (10YR 5/1) SILT, little Clay, no odor, dense, aplastic, saturated. Glacial-alluvial. | SILT |

**Boring Construction**

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available; - = Negative Test Result;
2" ID, 0.010" slot temporary well set 10-20' bgs.
Samples collected 0.7-2.7', 8.7-10.7' and 10.7-12.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 12/05/01 | 12.0' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-83/84-25

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 16<br>29<br>28<br>23 | 57 | NA | 0.0 | - | ML | | Gray (10YR 5/1) SILT, little Clay, no odor, dense, aplastic, saturated. Glacial-alluvial. | SILT | |
| | | 10 | 18-20 | NA | NA | NA | NA | - | | | Unable to spoon due to increased slough in hole and shortened mast. | | 2" ID, 0.010" slot temporary well set 10-20' bgs. |
| 20 | 20 | | | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available; - = Negative Test Result;
2" ID, 0.010" slot temporary well set 10-20' bgs.
Samples collected 0.7-2.7', 8.7-10.7' and 10.7-12.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 12/05/01 | 12.0' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/07/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4' x 2" ID Acetate Sleeves<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-26<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | Reinforced CONCRETE. | |
| | | 1 | 0.8-2.8 | NA | NA | 1.6 | 0.0 | - | ML | | Yellow-brown (10YR 5/4) aplastic SILT, some Clay, little fine to coarse subangular Sand, occasional concrete, gravel-sized Debris, no odor, moderately dense to dense, aplastic, dry. Till. | SILT |
| | | 2 | 2.8-4.8 | NA | NA | 2.0 | 0.0 | - | FL/ SM | | Interbedded layers of 2" wide CONCRETE and black 10YR 2/1 Silty SAND (SM) (Foundry Sand) layers up to 3" wide. Black (10YR 2/1) Silty SAND, fine to coarse subangular Sand, few Clay, no odor, moderately dense to dense, aplastic, dry. Fill. | SILTY SAND |
| 5 | 5 | 3 | 4.8-6.8 | NA | NA | NA | 0.0 | + | ML | | Yellow-brown (10YR 5/4) aplastic SILT, some Clay, little fine to coarse subangular Sand, occasional concrete, gravel-sized Debris, no odor, moderately dense to dense, aplastic, dry. Till. | SILT |
| | | 4 | 6.8-8.8 | NA | NA | 1.7 | 0.0 | + | SM | | Black (10YR 2/1) Silty SAND, well graded fine to coarse subangular Sand, few Clay, no odor, moderately dense to dense, aplastic, dry.<br><br>Becomes saturated to wet with oily sheen and moderate odor at 7' bgs. | SILTY SAND |
| | | 5 | 8.8-10 | NA | NA | NA | 0.4 | + | ML | | Brown (10YR 4/3) SILT, some fine subangular Sand, little Clay, weak odor, moderately dense. | SILT |
| 10 | 10 | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | |

**Boring Construction**

Borehole backfilled with bentonite to grade.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
+/- = Positive/Negative Test Result.
Samples collected 0.8-2.8' and 6.8-8.8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 12/07/01 | 7' bgs | product-? |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/13/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4' x 2" ID Acetate Sleeves<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 564105.89<br>**Easting:** 13305559.29<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** 741.92<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-27<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | FL | | Reinforced CONCRETE. | | |
| | 740 | 1 | 0.7-2.7 | NA | NA | 3.6 | 2.3 | - | SM | | Yellow-brown (10YR 5/4) subangular fine poorly graded Silty SAND, few Clay, no odor, dense, aplastic, dry. Fill<br><br>Black (10YR 2/1) subangular fine poorly graded Silty SAND, few Clay, few fine to coarse grained angular sand-sized Slag, no odor, dense, aplastic, dry to damp. Fill/Foundry Sand. | SILTY SAND | Borehole backfilled with bentonite to grade. |
| | | 2 | 2.7-4.7 | NA | NA | | 3.8 | - | | | | | |
| 5 | | 3 | 4.7-6.7 | NA | NA | 4.0 | 4.0 | - | | | | | |
| | 735 | 4 | 6.7-8.7 | NA | NA | | 5.6 | - | | | 1" Cement debris. | | |
| 10 | | 5 | 8.7-10 | NA | NA | 3.0 | 4.1 | - | | | Damp. | | |
| | 730 | 6 | 10.7-1 | NA | NA | 1.2 | 2.4 | - | | | | | |
| | | 7 | 12.7-1 | NA | NA | | 5.5 | - | CH | | Gray (10YR 2/1) Silty Fat CLAY, few to little fine to coarse subangular Sand, trace fine to medium subangular Gravel, no odor, soft, very plastic, wet to moist (nearly saturated). | | |
| 15 | | | | | | | | | | | 13.2' bgs: Obstruction, end of boring. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

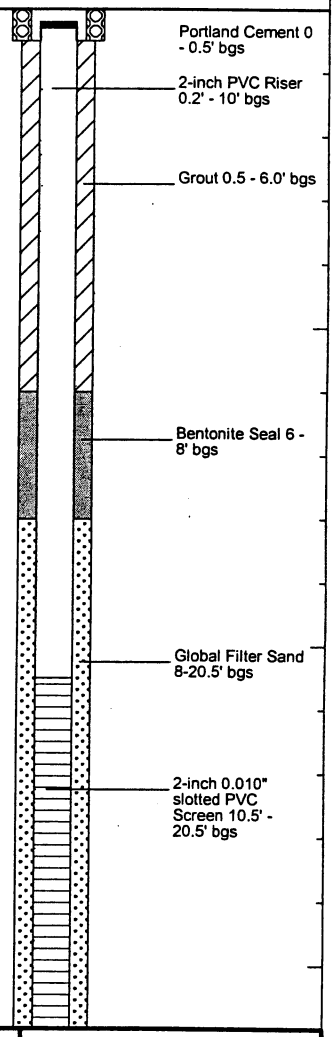
**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples collected 0.7-2.7', 6.7-8.7, and 8.7-10.7' bgs.
- = Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:**<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Alan Rau<br>**Drilling Method:** HSA<br>**Sampler Size:** NA<br>**Auger Size:**<br>**Rig Type:** | **Northing:** 564167.60<br>**Easting:** 13305485.99<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20.5' bgs<br>**Surface Elevation:** 745.84<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-27R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | NA | NA | NA | NA | NA | NA | NA | NA | | No Samples Taken. See log for RFI-83_84-27 for sampling information. | | |
| 5 | 740 | | | | | | | | | | | | |
| 10 | 735 | | | | | | | | | | | | |
| 15 | 730 | | | | | | | | | | | | |




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

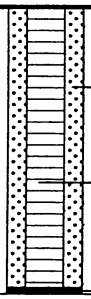
**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-83/84-27R

**Borehole Depth:** 20.5' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NA | NA | NA | NA | NA | NA | NA | NA | | No Samples Taken. See log for RFI-83_84-27 for sampling information. | | Global Filter Sand 8-20.5' bgs; 2-inch 0.010" slotted PVC Screen 10.5' - 20.5' bgs; PVC Cap |
| 20 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |
| | 710 | | | | | | | | | | | | |



BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/13/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 4 x 2" ID Acetate Sleeves<br>**Auger Size:** NA<br>**Rig Type:** Mule-mounted Geoprobe | **Northing:** 564058.00<br>**Easting:** 13305551.20<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 8' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-28<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | Large coarse sand- to pebble-sized predominantly large GRAVEL/AGGREGATE. | FILL | |
| | | | | | | | | | SM | | Brown (10YR 5/3) well graded fine to medium subangular Silty SAND, little large Gravel/Aggregate, no odor, dense, aplastic, damp. Fill, Aggregate, and former Topsoil. | | |
| | | 1 | 0.7-2.7 | NA | NA | 2.5' | 3.4 | - | FL | | Large coarse sand- to pebble-sized predominantly large GRAVEL/AGGREGATE. | FILL | Borehole backfilled with bentonite to grade. |
| | | 2 | 2.7-4.7 | NA | NA | 4.0' | 21.3 | + | ML | | Yellow-brown (10YR 5/4) SILT, little fine subangular Sand, little Clay, weak odor, dense, aplastic, damp to moist. | SILT | |
| | | | | | | | | | CH | | Gray (10YR 5/1) Silty Fat CLAY, moderate odor, soft, aplastic, moist. Wood Debris also present. Fill. | | |
| 5 | 5 | 3 | 4.7-6.7 | NA | NA | NA | 3.9 | + | ML | | Yellow-brown (10YR 5/4) with local lenses of black (10YR 2/1) SILT, little to some Clay, little fine subangular Sand, moderate odor, oily sheen, dense, aplastic, saturated. | SILT | |
| | | 4 | 6.7-8.0 | NA | NA | NA | 1.3 | + | | | | | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
+/- = Positive/Negative Test Result
Samples collected 0.7-2.7', 6.7-8.7' and 8.7-10.7' bgs.

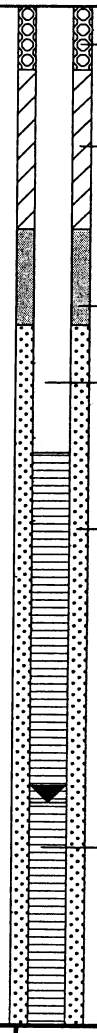
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 12/13/01 | 5.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/17/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2" ID x 2'<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 75 | **Northing:** 564070.89<br>**Easting:** 13305621.53<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 742.76<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-83/84-29<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | |
| 0 | | | | | | | | | FL | | Concrete. | FILL |
| | | 1 | 1-3 | 3 6 6 5 | 12 | 1.5 | 0.0 | - | SP | | Yellow-brown (10 YR 5/4) fine to medium poorly-graded subangular SAND, some to little Silt, trace Clay, no odor, dry, dense to moderately dense. Fill. | SAND |
| | | | | | | | | | FL | × × | Black (10 YR 2/1) fine to coarse sand-sized angular Slag and Cinders, no odor, dry, loose. | |
| | 740 | 2 | 3-5 | 4 4 4 4 | 8 | 1.0 | 0.0 | - | SP | | Yellow-brown (10 YR 5/4) fine to medium subangular poorly-graded SAND, little Silt, trace Clay, some Slag/Cinders as above, aplastic, no odor, dry, dense. | SAND |
| 5 | | 3 | 5-7 | 3 4 4 4 | 8 | 1.7 | 0.0 | - | ML | | Yellow-brown (10 YR 5/4) SILT, little fine subangular Sand, little Clay, aplastic, no odor, damp, dense. Black mottling throughout.<br>Slag/cinders mixed in.<br>3" wide fine to coarse subrounded to subangular sand lens. | SILT |
| | 735 | 4 | 7-9 | 4 5 4 4 | 9 | NA | 0.0 | - | | | Slag/cinders no longer present.<br>Coarsening downwards with increased sand size and increased moisture.<br>at 8.9': Moist. | |
| 10 | | 5 | 9-11 | 1 1 3 6 | 4 | 1.6 | 0.0 | - | | | Black (10 YR 2/1) organic SILT, some Clay, few fine to medium subrounded Sand, old roots and root structures present upper 6 inches, aplastic, "earthy" odor, moist, very dense. Possible paleo-topsoil. | |
| | | 6 | 11-13 | 5 6 12 12 | 18 | 1.4 | 0.0 | - | SW | | Gray (10 YR 6/1) to brown (10 YR 5/3) fine to coarse, predominantly fine, poorly-graded subangular SAND, little Silt, aplastic, no odor, moist, dense. Glacial-alluvial.<br>at 12.5': Saturated. | SAND, FINE |
| | 730 | 7 | 13-15 | 3 5 12 15 | 17 | 1.3 | 0.0 | - | | | | |
| 15 | | 8 | 15-17 | 3 4 | 9 | 1.8 | 0.0 | - | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Samples collected 1-3' and 9-11' bgs.
- = Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/17/02 | 12.5' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-83/84-29

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 15-17 | 5 8 | 9 | 1.8 | 0.0 | - | SW | | Gray (10 YR 6/1) to brown (10 YR 5/3) fine to coarse, predominantly fine, poorly-graded subangular SAND, little Silt, aplastic, no odor, saturated, dense. Glacial-alluvial. | | 2" ID Sch. 40 PVC 0.01" slotted screen 7-17' bgs |
| | 725 | 9 | 17-19 | 1 6 7 9 | 13 | 1.0 | 0.0 | - | CL | | Yellow-brown (10 YR 5/4) Silty CLAY, few fine to medium subrounded Sand, rare medium rounded Gravel, plastic, no odor, dry, soft with increasing stiffness with depth. Clay Till. At 18': Homogeneous gray (10 YR 5/1), very stiff. | SILTY CLAY | Sand pack 5-19' bgs |
| 20 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 710 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Samples collected 1-3' and 9-11' bgs.
- = Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/17/02 | 12.5' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:**<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:** 2 1/4"<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 560559.08<br>**Easting:** 13306168.33<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 727.64<br><br>**Descriptions By:** Brian Loomis | **Boring ID:** RFI-84-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | |
| 0 | | 1 | 0-0.5 | N/A | NA | - | FL | | CONCRETE. | | |
| | | 2 | 0.5-2 | N/A | 0.0 | - | SP | | Very dark gray (YR 3/1) subangular SAND with some Gravel, trace Clay. | SAND | Borehole backfilled with Bentonite to grade. |
| | 725 | 3 | 2-4 | 1.0 | 0.0 | - | | | | | |
| 5 | | 4 | 4-6 | 1.2 | NA | - | | | | | |
| | | 5 | 6-8 | 2.0 | NA | - | | | Dark yellowish-brown brown (10YR 4/6) fine rounded to subrounded SAND, trace rounded Gravel, moist. | | |
| | 720 | 6 | 8-10 | 1.3 | 3.5 | - | CL | | Dark yellowish-brown (10YR) CLAY, trace rounded Gravel, very stiff. | CLAY | |
| 10 | | 7 | 10-12 | 2.0 | 0.1 | - | | | (10.0-11.0) Brownish-yellow 10YR 6/8 CLAY, gray mottles, very stiff. | | |
| | | | | | | | SP | | Brownish-yellow (10YR 6/8) subrounded SAND, trace subangular Gravel. | | |
| | | | | | | | CL | | Brownish-yellow (10YR 6/8) CLAY, very stiff. | | |
| | | | | | | | SP | | Brownish-yellow (10YR 6/8) subrounded fine SAND, wet to saturated. | | |
| | 715 | | | | | | GW | | Very dark gray medium to coarse (5Y 3/1) subrounded to subangular GRAVEL, moist. | | |
| | | 8 | 12-14 | 2.0 | NA | - | CL | | Brown (10YR 5/3) CLAY, little Silt, few fine to coarse subrounded to subangular Sand and fine to medium-grained Gravel, stiff to very stiff, no odor, dry. Clay Till. | | |
| 15 | | 9 | 14-16 | 2.0 | NA | - | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
Samples collected 0.5-2', 8-10' and 16-17.5' bgs.
- = Negative Test Result; NA=Not Available/Not Applicable.
1" ID 5-ft 0.01" slot screen temporary well set at 19' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 05/08/01 | 18.0' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-84-01

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 16-17 | 1.5 | NA | - | CL | | Brown (10YR 5/3) CLAY, little Silt, few fine to coarse subrounded to subangular Sand and fine to medium-grained Gravel, stiff to very stiff, no odor, dry. Clay Till. | CLAY | Borehole backfilled with Bentonite to grade. |
| | 710 | | | | | | | | (17.5-18.0) As above, increased Sand to some. | | |
| | | 11 | 17-19 | NA | NA | - | SP | | Brown (10YR 5/3) fine to medium subangular to subrounded SAND, little to some Silt, trace fine to medium rounded Gravel, no odor, wet to saturated, moderately dense. | SAND | |
| | | | | | | | CL | | Same as interval from 12.8' - 17.5' bgs. | | |
| 20 | | | | | | | | | | | |
| | 705 | | | | | | | | | | |
| 25 | | | | | | | | | | | |
| | 700 | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| | 695 | | | | | | | | | | |
| 35 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
Samples collected 0.5-2', 8-10' and 16-17.5' bgs.
- = Negative Test Result; NA=Not Available/Not Applicable.
1" ID 5-ft 0.01" slot screen temporary well set at 19' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 05/08/01 | 18.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:**<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:** 2 1/4"<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 560667.09<br>**Easting:** 13306191.26<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 15' bgs<br>**Surface Elevation:** 727.68<br><br>**Descriptions By:** Brian Loomis | **Boring ID:** RFI-84-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | |
| 0 | | 1 | 0-2 | 1.2 | 0.0 | NA | FL | | CONCRETE. | FILL | |
| | | | | | | | SP | | Yellow-brown (10YR 5/8) fine to medium subrounded SAND. | SAND | |
| | | | | | | | | | Dark brown (10YR 4/3) fine subangular SAND, some subrounded to subangular Gravel, little Clay. | | |
| | 725 | 2 | 2-4 | 1.1 | 0.0 | NA | | | Yellow-brown (10YR 5/6) fine subrounded SAND. | | Borehole backfilled with Bentonite to grade. |
| | | | | | | | | | Dark brown (10YR 4/3) fine to medium rounded SAND, trace Silt. | | |
| | | | | | | | | | Yellow-brown (10YR 5/6) subrounded SAND, trace Silt. | | |
| 5 | | 3 | 4-6 | 1.6 | 0.0 | NA | | | Dark brown (10YR 5/6) fine to medium rounded SAND, trace Silt. | | |
| | | | | | | | | | Dark yellowish-brown (10YR 3/4) fine rounded SAND. | | |
| | | 4 | 6-8 | 1.5 | 0.0 | NA | | | Yellowish-brown (10YR 6/8) fine rounded to subrounded SAND. | | |
| | 720 | | | | | | | | | | |
| | | 5 | 8-10 | 1.5 | 0.0 | NA | | | Brownish-yellow (10YR 6/8) fine subangular to angular SAND, moist. | | |
| 10 | | | | | | | CL | | Brownish-yellow (10YR 6/8) CLAY, very stiff. | CLAY | |
| | | 6 | 10-12 | 1.0 | 0.0 | NA | | | Brownish-yellow (10YR 6/8) CLAY, soft, moist. | | |
| | 715 | 7 | 12-15 | NA | NA | NA | SM | | Brownish-yellow (10YR 6/8) Silty SAND, soft, wet to saturated. | SILTY SAND | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Set 1" temporary well at 6-11' bgs;
Samples collected 0.8-2' and 8-10' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 05/08/01 | 12.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/8/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:** 2 1/4"<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 560779.59<br>**Easting:** 13306211.33<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 727.69<br><br>**Descriptions By:** Brian Loomis | **Boring ID:** RFI-84-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | |
| 0 | | | | | | | FL | | CONCRETE. | FILL | |
| | | 1 | 0-2 | 0.9 | 3.2 | - | SP | | Yellowish-brown (10YR 5/6) fine subrounded SAND.<br>Yellowish-brown (10YR 5/4) very fine SAND to SILT, trace rounded Silt and Clay. | SAND | |
| | 725 | 2 | 2-4 | 1.5 | 3.3 | - | | | Very dark grayish-brown (10YR 3/2) fine to medium SAND with subrounded Gravel.<br>Yellowish-brown (10YR 5/4) very fine SAND to SILT, trace rounded Silt and Clay.<br>Very dark grayish-brown (10YR 3/2) fine to medium SAND with subrounded Gravel. | | Borehole backfilled with Bentonite to grade. |
| 5 | | 3 | 4-6 | 1.4 | 7.5 | - | | | Dark brown (10YR 3/3) fine to medium subrounded SAND.<br>Yellowish-brown (10YR 5/8) fine rounded SAND. | | |
| | | 4 | 6-8 | 1.3 | 8.8 | - | CL | | Grayish-brown (10YR 5/2) CLAY, very stiff to hard. Clay Till. | CLAY | |
| | 720 | 5 | 8-10 | 2.0 | 9.1 | - | | | | | |
| 10 | | 6 | 10-12 | 2.0 | 3.7 | - | | | Dark yellowish-brown (10YR 4/6) CLAY, trace to little fine rounded Sand, stiff, elastic, moist to wet. | | |
| | 715 | 7 | 12-14 | 1.4 | 4.3 | - | SP | | Dark yellowish-brown (10YR 4/6) rounded to subrounded fine SAND, wet. | SAND | |
| 15 | | 8 | 14-16 | 1.6 | 6.9 | - | | | Grayish-brown (10YR 3/2) medium subrounded to subangular SAND, saturated. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs=below ground surface;
NA = Not Applicable/Not Available
Set 1" temporary well at 17.5' bgs
Samples collected 0.8-2', 8-10' and 12-14' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 05/08/01 | 14.5' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/8/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:** 2 1/4"<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 561168.99<br>**Easting:** 13306085.98<br>**Casing Elevation:** 727.25<br><br>**Borehole Depth:** 14' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** Brian Loomis | **Boring ID:** RFI-84-04<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | |
| 0 | | | | | | | Fill | | CONCRETE. | FILL | |
| | | 1 | 0-2 | 1.2 | NA | - | SP | | Very dark gray-brown fine SAND, little Silt and Gravel. | SAND | |
| | | | | | | | | | Very dark brown fine to medium SAND, some Gravel. | | |
| | | | | | | | | | Red fine to medium SAND and FILL. | | |
| | 725 | 2 | 2-4 | 1.6 | NA | - | | | Brown fine to medium SAND, little Gravel, dry. | | Borehole backfilled with Bentonite to grade. |
| 5 | | 3 | 4-6 | 1.0 | NA | - | | | Red fine to medium SAND and FILL. | | |
| | 720 | 4 | 6-8 | 1.5 | NA | - | | | Dark yellow-brown fine to medium SAND, little Slt and Gravel. | | |
| | | 5 | 8-10 | 1.5 | NA | - | CL | | Yellow-brown fine SAND and CLAY, trace Gravel. | CLAY | |
| 10 | | 6 | 10-12 | 2.0 | NA | - | | | | | |
| | 715 | 7 | 12-14 | 2.0 | NA | - | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs=below ground surface; - = Negative Test Result;
NA = Not Applicable/Not Available;
1" ID 5-ft 0.01" slot screen temporary well set at 14' bgs.
Samples collected 0.8-2', 8-10' and 12-14' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | NA | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/24/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2" x 2'ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** | **Northing:** 561223.46<br>**Easting:** 13306273.39<br>**Casing Elevation:** 726.63<br><br>**Borehole Depth:** 22' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** S. M. Duly | **Boring ID:** RFI-84-05<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | | | |
| | 725 | 1 | 0-2 | - - 3 6 | 3 | 0.9 | NA | - | FL | | CONCRETE. | FILL | Cement pad with 9" diam. flush-mount cover; Grout 1-2' bgs |
| | | 2 | 2-4 | 3 4 8 4 | 12 | 1.0 | NA | - | ML | | Black (10 YR 2/1) aplastic SILT, little to few Clay, few fine subangular yellow-brown (10 YR 5/4) Sand, damp, moderately dense, no odor. | | |
| 5 | | 3 | 4-6 | 3 4 6 6 | 10 | 1.4 | NA | - | SP | | Yellow-brown (10 YR 5/4) fine to medium subangular quartz-rich SAND, some Silt, trace Clay, dry, moderately loose to moderately dense, no odor. At 3.7' bgs, 1/2" lense of black fine-grained subangular slag (?). | SAND | Bentonite seal 2-6' bgs |
| | 720 | 4 | 6-8 | 3 4 6 6 | 10 | 1.7 | NA | - | | | Light brown-yellow (10 YR 6/4) fine to medium subangular to angular SAND, locally semi-lithified to a sandstone, some Silt, trace Clay, damp, moderately loose to moderately dense, no odor. | | |
| | | 5 | 8-10 | 3 6 9 12 | 15 | 1.5 | NA | - | CL | | Gray (10 YR 5/1) CLAY, some Silt, little fine to medium subrounded to subangular Sand, trace fine to coarse subrounded to rounded Gravel, damp, moderately stiff to very stiff (pp=2.5 tons/sq. feet). Locally oxidized/mottled to yellow-brown (10 YR 5/6). Clay Till. | CLAY | 2" ID Sch. 40 PVC riser 0.2-8' bgs |
| 10 | | 6 | 10-12 | 3 10 14 15 | 24 | 2.0 | NA | - | | | at 6.5': Increased oxidation throughout and increased stiffness to hard yellow-brown (10YR 5/4) Clay (pp=4.5 tons/sq. feet). | | |
| | 715 | 7 | 12-14 | 2 10 10 12 | 20 | 1.8 | NA | - | | | Decreased oxidation. | | #5 Global filter sandpack 6-18' bgs |
| 15 | | 8 | 14-16 | 2 4 4 7 | 8 | 1.9 | NA | - | | | No oxidation/mottling, homogeneous gray (10 YR 5/1) Clay. Clay Till. | | |
| | | | | | | | | | | | Dry, hard, with occasional oxidation along fractures <= 1 mm wide. Increases in silt lenses up to 1" wide, damp. | | 2" ID Sch. 40 PVC 0.010" slotted screen 8-18' bgs |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; pp=pocket penetrometer
NA = Not Applicable/Not Available;- = Negative Result.
Water level rose to 10.2' overnight.
Samples collected 0.8-2.8' and 6.8-8.8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-84-05

**Borehole Depth:** 22' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 710 | 9 | 16-18 | 2 5 6 7 | 11 | 2.0 | NA | - | CL | | Similar to above, but SILTY CLAY, moist to wet with increased moisture. | SILTY CLAY | 2" ID Sch. 40 PVC 0.010" slotted screen 8-18' bgs; #5 Global filter sandpack 6-18' bgs |
| | | 10 | 18-20 | 2 3 4 5 | 7 | 1.6 | NA | - | ML | | Gray (10 YR 5/1) SILT, few to little fine subangular Sand, some Clay, wet, dense, no odor. | SILT | Natural collapse 18-22' bgs |
| 20 | 705 | 11 | 20-22 | 2 4 4 5 | 8 | 1.8 | NA | - | | | | | |
| 25 | | | | | | | | | | | | | |
| | 700 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 695 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; pp=pocket penetromete
NA = Not Applicable/Not Available;- = Negative Result.
Water level rose to 10.2' overnight.
Samples collected 0.8-2.8' and 6.8-8.8' bgs.

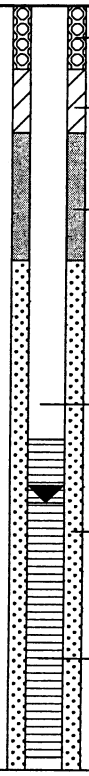
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/21/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 560433.88<br>**Easting:** 13306117.84<br>**Casing Elevation:** 723.26<br><br>**Borehole Depth:** 12' bgs<br>**Surface Elevation:** 723.37<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-84-06<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 725 | | | | | | | | | | |
| 0 | | 1 | 0-2 | NA<br>3<br>7<br>6 | 10 | 1.0 | 6.1 | - | FL | ASPHALT.<br>CONCRETE. | Fill |
| | | | | | | | | | ML | Light gray (10 YR 7/1) SILT, some fine to medium subangular Sand (mostly fine), trace Clay, trace fine to coarse subangular Gravel, aplastic, no odor, dry, loose. | SILT |
| | | | | | | | | | SP | Black (10 YR 2/1) SILT, few to little Clay, aplastic, no odor, moist to damp, very dense. | SILT |
| | 720 | 2 | 2-4 | 9<br>7<br>7<br>6 | 14 | 1.5 | 2.5 | - | ML | Brown (10 YR 4/3) fine to coarse subangular SAND, few fine to coarse subangular to subrounded Gravel, little Silt, aplastic, no odor, dry, loose. | |
| | | | | | | | | | SP | Black to dark brown (10 YR 6/2) SILT, as at 1.3-1.7' bgs, some fine to medium subangular Sand. | |
| | | | | | | | | | ML | SAND, as at 1.7-1.9' bgs, moist, increased Clay content toward lower contact. | SILT |
| 5 | | 3 | 4-6 | 4<br>6<br>12<br>12 | 18 | 2.0 | 3.4 | - | CL | Light brown-gray (10 YR 6/2) SILT, local oxidation to yellow-brown (10 YR 5/6), lenses up to 1" wide of fine to coarsesubangular Sand and Gravel, otherwise little fine to medium subangular Sand, little Clay, aplastic, no odor, moist, very dense. | CLAY |
| | | 4 | 6-8 | 4<br>9<br>18<br>24 | 27 | 1.5 | 4.4 | - | | Gray (10 YR 5/1) CLAY with yellow-brown (10 YR 5/4) mottling/oxidation along fractures and selvages, some to little Silt, little fine to medium subrounded to subangular Sand, trace fine to coarse rounded to subrounded Gravel, no odor, dry, hard (pp>=4.5 tons/sq. feet). Clay Till. | |
| | | | | | | | | | ML | SILT, as at 3.9-4.5' bgs. | |
| | 715 | 5 | 8-10 | 12<br>9<br>10<br>9 | 19 | NA | 4.5 | - | SP | Dark yellow-brown (10 YR 4/4) fine to coarse subangular SAND, little Silt, little Clay, few fine to coarse subrounded Gravel, aplastic, no odor, wet, loose. | SAND |
| 10 | | 6 | 10-12 | 5<br>11<br>14<br>15 | 25 | NA | 3.3 | - | CL | Homogeneous dark gray (10 YR 4/1) CLAY, some Silt, little fine to medium subangular to subrounded Sand, few fine to coarse rounded to subrounded Gravel, no odor, dry, hard (pp>=4.5 tons/sq. feet). Clay Till. | CLAY |
| | 710 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

Boring Construction



- Cement pad with 9" diam. flush-mount cover.
- Grout 1-2' bgs.
- Bentonite seal 2-4' bgs.
- 2" ID Sch. 40 PVC riser 0.2-6.8' bgs.
- #5 Global filter sandpack 4-12' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 6.8-11.8' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; - = Negative Test Result
NA = Not Applicable/Not Available.
Samples collected 0.9-2' and 4-6' bgs.
pp=pocket penetrometer

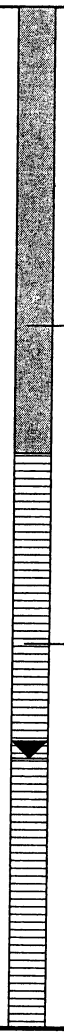
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/21/01 | 7.8' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/22/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 563389.7<br>**Easting:** 13305984.92<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 742.91<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-85-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | |
| 0 | | 1 | 0-2 | NA NA 4 5 | 4 | 0.3 | 84.6 | - | FL | | Concrete | FILL |
| | 740 | 2 | 2-4 | 3 5 6 6 | 11 | 1.2 | 132 | - | ML | | Black (10 YR 3/1) SILT. Some fine Sand. Little Clay. Loose, dry, no odor. At 3.8' bgs, increase in Clay content, local oxidation and moist. | SILT |
| 5 | | 3 | 4-6 | 3 4 5 6 | 9 | 1.7 | 147 | - | | | Yellow brown (10 YR 5/6) fine aplastic SAND. Some Silt. Dense, no odor.<br>Very dark grayish-brown plastic SILT (10 YR3/2). Little Clay. Trace fine Sand. Dense, damp, no odor.<br>Gray brown (2.5 Y 3/2) SILT. Some Clay. Little fine Sand. Dense, moist, no odor. | SILT |
| | 735 | 4 | 6-8 | 2 3 3 5 | 6 | 1.8 | 125 | - | CL | | Grayish brown (2.5 Y 3/7) CLAY. Silt lenses up to 3" wide. Trace of fine Sand. No odor. Local oxidation. Turns gray (10 YR 6/1) with 10 YR 5/4 mottling at 6.6' bgs. Saturated at 8.4' bgs. | CLAY |
| 10 | | 5 | 8-10 | 3 4 6 8 | 10 | 1.5 | 84 | - | | | | |
| | 730 | 6 | 10-12 | 7 6 6 7 | 12 | 1.4 | 116 | - | SP | | Yellow brown (10 YR 5/6) fine to coarse SAND. Loose. | SAND |
| 15 | | 7 | 12-14 | 2 4 5 7 | 9 | 1.4 | 78 | - | | | | |
| | | 8 | 14-16 | 2 4 6 7 | 10 | 2 | 96 | - | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1.3-3.3', 7.3-9.3' and 9.3-11.3' bgs.
- = Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/22/01 | 11.8 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-85-02

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | SP | | Yellow brown (10 YR 5/6) fine to coarse SAND. Loose. | | |
| | | | | NA | NA | | | - | CL | | Gray (10 YR 6/1) CLAY. Some Silt. Hard initially, soft at 16.8' bgs. Moist. | | |
| | 725 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 710 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 1.3-3.3', 7.3-9.3' and 9.3-11.3' bgs.
- = Negative Test Result.

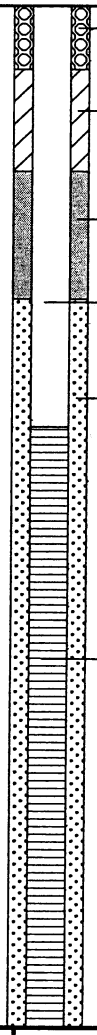
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/22/01 | 11.8 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/05/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4" ID HSA<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-85-02R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | | | Redrilled. See original log for RFI-85-02. | |
| 5 | 5 | | NA | NA | NA | NA | NA | NA | | | | |
| 10 | 10 | | | | | | | | | | | |
| 15 | 15 | 1 | 14-16 | 2<br>2<br>4<br>7 | 6 | 1.8 | NA | NA | ML | | Dark yellow-brown (10YR 4/6) fine to medium subangular SAND, predominantly medium, little Silt, poorly-graded, no odor, moderately dense to moderately loose, saturated. Glacial-alluvial. | SAND |

Boring Construction




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
For descriptions/data from 0 to 14' bgs, see RFI-85-02.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-85-02R

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 16-18 | 2<br>3<br>4<br>5 | 7 | 1.8 | NA | NA | ML<br>CH<br>CL | | Dark yellow-brown (10YR 5/1) SILT, little to some Clay, no odor, moderately dense, aplastic, moist to wet. Increased gray tone with depth. Glacial-alluvial.<br>Gray (10YR 5/1) Fat Silty CLAY becoming decreasingly plastic to a Lean Silty CLAY with depth, trace fine subangular SAND, no odor, moderately stiff becoming increasingly stiff with depth, moderately plastic, damp to moist with increasing moisture with depth. Glacial Clay Till. | SILT<br>CLAY | Sand Pack 4.6'-16.8' bgs<br>2" ID PVC 0.010" Slotted Screen 6.6-16.6' bgs<br>PVC Cap 16.6-16.8' bgs |
| | 20 | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | |
| | 30 | | | | | | | | | | | | |
| | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
For descriptions/data from 0 to 14' bgs, see RFI-85-02.

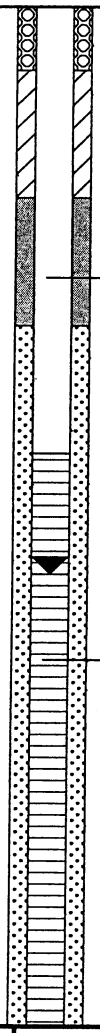
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/20/01<br>**Drilling Company:** RauDrilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 563392.64<br>**Easting:** 13305888.89<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 746.21<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-85-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Asphalt. | |
| 0 | | | | | | | | | FL | | Concrete. | Fill |
| | 745 | 1 | 1-3 | 3 3 4 4 | 7 | 1.4 | 426 | - | | | Brown (10 YR 4/3) fine to medium SAND with black staining throughout. Some Silt. Little Clay. Moderately dense to loose, no odor. Yellowish brown (10 YR 5/6) with oxidation and black staining at 4.0'bgs. | SAND |
| | | 2 | 3-5 | 2 4 7 9 | 11 | 0.9 | 2103 | - | | | | |
| 5 | | | | | | | | | SP | | Light brownish grey fine to coarse subangular SAND.Trace Slag. Loose, aplastic, dry to damp. | |
| | 740 | 3 | 5-7 | 6 8 9 12 | 17 | 1.1 | 1296 | - | SL | | Yellow brown (10 YR 5/6) SILT. Little Clay and fine to medium Sand. Dry to damp at 6.8' bgs. Saturated at 8.0' bgs. | SILT |
| | | 4 | 7-9 | 3 3 4 5 | 7 | 1.5 | 209 | - | | | | |
| | | | | | | | | | CL | | Grey (10 YR 6/1) SILTY CLAY. Local oxidation. Trace fine subangular Sand. Soft, low plasticity, damp, no odor. | |
| 10 | | 5 | 9-11 | 1 2 2 1 | 4 | 1.2 | 256 | - | SP | | Yellow brown (10 YR 5/6) fine to medium subangular SAND. Little Silt. Wet (saturated) no odor. Some Clay at 10.7' bgs. No more Clay and loose at 12.3' bgs. | SAND |
| | 735 | 6 | 11-13 | 1 2 2 2 | 4 | 1.4 | 156 | - | | | | |
| | | 7 | 13-15 | 2 3 2 3 | 5 | 1.3 | 38.3 | - | | | | |
| 15 | | 8 | 15-17 | 2 3 | 7 | 1.7 | 74.7 | - | CL | | Grey (10 YR 5/1) CLAY. Soft, highly plastic, 1" Silt seams throughout. | CLAY |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Samples colleced 1-3' and 5-7' bgs.
- = Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/20/01 | 8.9' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-85-03

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | 8 | 15-17 | 4<br>2 | 7 | 1.7 | 74.7 | - | CL | | Grey (10 YR 5/1) CLAY. Soft, highly plastic, 1" Silt seams throughout. | CLAY | 2" ID Sch. 40 PVC 0.010" slotted screen 7-17' bgs |
| 20 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Samples colleced 1-3' and 5-7' bgs.
- = Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/20/01 | 8.9' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/30/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2" ID x 2'<br>**Auger Size:** 4 1/4" ID HSA<br>**Rig Type:** CME 45C | **Northing:** 563158.23<br>**Easting:** 13305814.74<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 746.0<br><br>**Descriptions By:** S Kerr | **Boring ID:** RFI-85-04<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | FILL | | CONCRETE | FILL |
| | 745 | 1 | 0-2 | 1 1 2 1 | 3 | 1.2 | 0.0 | NA | | | Yellow-brown (10 YR 5/6) fine to medium SAND, little Silt, aplastic, loose, dry, no odor. Fill | SAND |
| | | 2 | 2-4 | 1 1 1 1 | 2 | 1.4 | 0.0 | NA | | | Trace Clay, damp. | |
| 5 | | 3 | 4-6 | 1 1 1 1 | 2 | 1.5 | 2.3 | NA | | | | |
| | 740 | 4 | 6-8 | 2 2 1 2 | 3 | 1.5 | 1.5 | NA | SP | | Moist. | |
| | | 5 | 8-10 | 1 2 2 3 | 4 | 2.0 | 0.0 | NA | | | | |
| 10 | 735 | 6 | 10-12 | 3 4 3 3 | 7 | 2.0 | 1.3 | NA | | | | |
| | | 7 | 12-14 | 2 3 3 2 | 6 | 2.0 | 0.0 | NA | | | | |
| 15 | | 8 | 14-16 | 1 2 2 3 | 4 | 1.5 | 0.0 | NA | CL | | Saturated.<br>Gray (10 YR 5/1) CLAY, trace Silt, medium stiff, highly plastic, no odor, moist. | CLAY |

**Boring Construction**

- Portland Cement 0 - 1' bgs
- Well Grout 1 - 7' bgs
- 2" PVC Riser 0.2 - 11' bgs
- Bentonite Seal 7 - 9' bgs
- #5 Global Filter Pack 9-18' bgs
- 2" 0.010 Slot machined PVC Screen 11-16' bgs

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0.5-2.5', 8.5-10.5' and 12.5-14.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/30/01 | 14.5' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-85-04

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 2 2 2 7 | 4 | 1.8 | 0.0 | NA | CL | | Gray (10 YR 5/1) CLAY, trace Silt, medium stiff, highly plastic, no odor, moist. | CLAY | #5 Global Filter Pack 9-18' bgs |
| 20 | 725 | | | | | | | | | | | | |
| 25 | 720 | | | | | | | | | | | | |
| 30 | 715 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0.5-2.5', 8.5-10.5' and 12.5-14.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/30/01 | 14.5' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 12/11/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3' 1/4" ID HSA<br>**Rig Type:** CME 45 Skid Rig | **Northing:** 563158.2<br>**Easting:** 13305820.7<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 26.5' bgs<br>**Surface Elevation:** 745.95<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-85-04R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 745 | | | | | | | | | | Reinforced CONCRETE.<br>See original boring log for RFI-85-04. | FILL<br>See original boring log for RFI-85-04. | Portland Cement 0-1' bgs |
| 5 | 740 | NA | NA | NA | NA | NA | NA | NA | NA | | | | 2" PVC Riser 0.2-21.5' bgs<br>Well Grout 1-17.5' bgs |
| 10 | 735 | | | | | | | | | | | | |
| 15 | 730 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
See original boring log for RFI 85-04.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

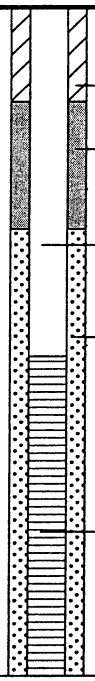
**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-85-04R

**Borehole Depth:** 26.5' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | See original boring log for RFI-85-04. | See original boring log for RFI-85-04. | |
| 20 | 725 | NA | NA | NA | NA | NA | NA | NA | NA | | | | |
| 25 | 720 | | | | | | | | | | | | |
| 30 | 715 | | | | | | | | | | | | |
| 35 | 710 | | | | | | | | | | | | |




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
See original boring log for RFI 85-04.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/24/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2" ID x 2'<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 563157.04<br>**Easting:** 13305978.46<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 24' bgs<br>**Surface Elevation:** 745.95<br><br>**Descriptions By:** S. Duly | **Boring ID:** RFI-85-05<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | | |
| | 745 | 1 | 0-2 | 4 4 5 5 | 9 | 1.8 | 1618 | + | FL | | CONCRETE | FILL |
| | | | | | | | | | SW | | Yellow-brown (10YR 5/4) fine subangular to subrounded SAND, some Silt, aplastic, no odor, damp, loose. Fill. | SAND |
| | | 2 | 2-4 | 3 5 7 7 | 12 | 1.3 | 1534 | + | ML | | Black (10YR 2/1) SILT, some fine subangular to subrounded Sand, few Clay, aplastic, no odor, moderately loose to moderately dense.<br>Damp. | SILT |
| 5 | | 3 | 4-6 | 3 3 4 3 | 7 | 1.2 | 2010 | + | | | Increased Clay to little.<br>Moist. | |
| | 740 | 4 | 6-8 | 1 2 2 1 | 4 | 1.3 | 1895 | + | SW | | Yellow-brown (10YR 5/8) SAND, as above but moist and moderately loose, becoming less dense with depth and increased moisture. | SAND |
| | | 5 | 8-10 | 2 3 3 2 | 6 | 1.8 | 1342 | - | | | | |
| 10 | 735 | 6 | 10-12 | 1 2 1 1 | 3 | 1.2 | 1601 | - | | | Moist to wet. | |
| | | 7 | 12-14 | 2 3 4 7 | 7 | 1.2 | 793 | - | | | | |
| 15 | | 8 | 14-16 | 1 2 3 4 | 5 | 2.0 | 9702 | - | | | Moist, Quartz-rich. | |
| | 730 | | | | | | | | | | Yellow-brown (10YR 5/2) Silty CLAY, some Silt, few fine to | |

**Boring Construction**

- Portland Cement 0-1' bgs
- Well Grout 1-3' bgs
- 2" PVC Riser 0.2-19' bgs
- Bentonite Seal 3-17' bgs

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Samples collected 1-3', 5-7', 9-11' and 17-19' bgs.
+/- = Positive/Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/24/01 | 20' | |

**Client:**
General Motors

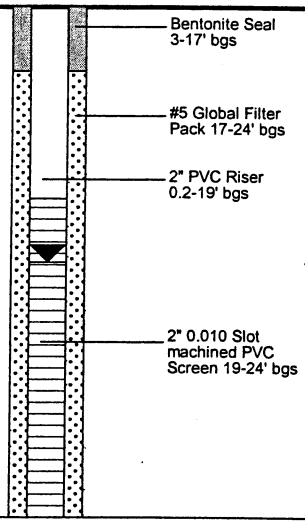
**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-85-05

**Borehole Depth:** 24' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 4 5 5 4 | 10 | 2.0 | 1103 | - | ML/ CL | | medium Sand and fine rounded Gravel, soft to medium stiff, no odor, damp, local oxidation along fractures. Homogeneous gray (10YR 5/1) local Silt lenses up to 2" wide throughout. Clay Till. Moderately stiff to stiff. | CLAY |
| | | 10 | 18-20 | 2 4 3 4 | 7 | 2.0 | 1546 | - | | | | |
| 20 | 725 | 11 | 20-22 | 4 7 9 11 | 16 | 1.5 | 155 | - | | | at 20': Increased silt lenses and seams up to 6" thick, some Clay, little fine subangular to subrounded Sand, no odor, saturated, dense. | SILT |
| | | | | | | | | | SP | | Brown (10YR 3/3) subrounded to subangular fine to coarse SAND, little Silt, trace Clay, few fine to medium rounded Gravel, aplastic, no odor, saturated, loose. Glacial-alluvial. | SAND |
| | | 12 | 22-24 | NA | NA | NA | NA | NA | CL | | Gray (10YR 5/1) Silty CLAY, little fine to medium subangular to subrounded Sand, few to trace fine to medium rounded Gravel, no odor, dry, very stiff to hard. Clay Till. | SILTY CLAY |
| 25 | 720 | | | | | | | | | | | |
| 30 | 715 | | | | | | | | | | | |
| 35 | 710 | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
Samples collected 1-3', 5-7', 9-11' and 17-19' bgs.
+/- = Positive/Negative Test Result.

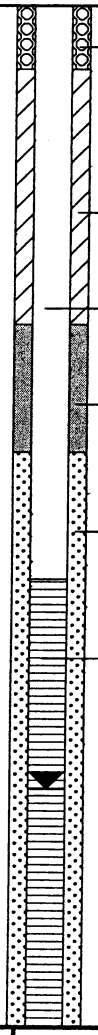
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/24/01 | 20' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/22/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 563257.26<br>**Easting:** 13306085.31<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 742.43<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-85-06<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | |
| 0 | | | | | | | | | FILL | | Concrete | FILL |
| | | 1 | 0-2 | 1 1 1 1 | 2 | 1.2 | 875 | + | SP | | Yellow brown (10 YR 5/6) SAND. Some Silt. Little Clay. Loose, aplastic, damp, no odor. Black (10 YR 2/1) at 1.9' bgs. | SAND |
| | 740 | 2 | 2-4 | 2 2 2 2 | 4 | 1.5 | 546 | + | | | Yellow brown (10 YR 5/6) fine to medium SAND as above but with increase in Clay content. | |
| 5 | | 3 | 4-6 | 1 2 1 3 | 3 | 1.6 | 592 | + | CL | | Yellow brown (10 YR5/6) sandy CLAY. Some fine to medium Sand. Soft, plastic, damp, no odor. Local oxidation. | SANDY CLAY |
| | 735 | 4 | 6-8 | 2 2 2 1 | 4 | 1.3 | 999 | - | SP | | SAND as at 2.7'-4.4' bgs. | SAND |
| 10 | | 5 | 8.7-10. | 2 1 2 1 | 3 | 1.4 | 1096 | + | | | Becomes moist to wet and no more Clay. At 9.8' to 10.5', some Silt. | |
| | | 6 | 10.7-12 | 1 2 1 1 | 3 | 1.6 | 1562 | + | | | | |
| | 730 | 7 | 12-14 | 1 1 2 3 | 3 | 1.7 | 1717 | + | | | From 13.7'-14.5' bgs, black staining, oily sheens and odor. | |
| 15 | | 8 | 14-16 | 2 2 3 3 | 5 | 1.5 | 1325 | + | | | No more stains at 14.5' bgs but odor and sheen still there. | |

**Boring Construction**



- Cement seal with 9" diam flush-mount cover.
- Cement/bentonite grout 1-5' bgs.
- 2" ID PVC riser to 9' bgs.
- Bentonite grout seal 5-7' bgs.
- #5 Global filter sandpack 7-19' bgs.
- 2" ID PVC 0.010" slotted screen 9-19' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.7-2.7', 8.7-10.7' and 10.7-12.7' bgs.
+/- = Positive/Negative Test Result

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/22/01 | 12.7' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-85-06

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 725 | 9 | 16-18 | 6 8 16 14 | 24 | 2 | 2445 | + | SP | | SAND, as above (6.3-16' bgs). No odor, no sheen. | SAND | 2" ID PVC 0.010" slotted screen 9-19' bgs. |
| | | 10 | 18-19 | NA | NA | NA | NA | NA | ML | | Yellow brown (10 YR 5/6) SILT. Saturated, dense, no odor. Local oxidation. Gray (10 YR 6/1) silt in tip of shoe. | SILT | #5 Global filter sandpack 7-19' bgs. |
| 20 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 710 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.7-2.7', 8.7-10.7' and 10.7-12.7' bgs.
+/- = Positive/Negative Test Result

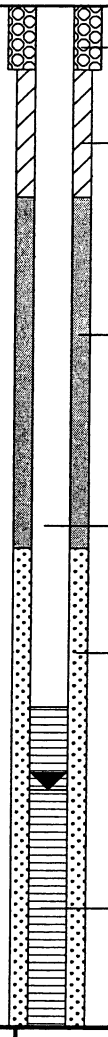
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/22/01 | 12.7' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/07/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 563474.26<br>**Easting:** 13306042.61<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 21' bgs<br>**Surface Elevation:** 745.97<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-85-07<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | FILL | | ASPHALT. | FILL |
| | 745 | 1 | 0.5-2.5 | 5 7 7 10 | 14 | 1.3 | 0.0 | - | ML | | Black (10YR 2/1) to dark brown (10YR 3/3) SILT, some subangular to angular fine to coarse Sand (foundry), little to some fine to coarse sand-sized up to gravel-sized angular Slag, little to few Clay, no odor, moderately dense, aplastic, dry. Fill. | SILT |
| | | 2 | 3-5 | 4 4 5 4 | 9 | 1.2 | 1.8 | - | | | Increased Slag content and increased fine to medium subangular Sand content. | |
| 5 | 740 | 3 | 5-7 | 2 3 3 4 | 6 | 1.2 | 0.0 | - | | | Local patches of yellow-brown 10YR 5/4 fine grained Sand. Trace Slag and increased Clay to little to some. | |
| | | 4 | 7-9 | 2 2 2 2 | 4 | 0.8 | 2.0 | - | | | | |
| 10 | 735 | 5 | 9-11 | 4 4 3 5 | 7 | 1.4 | 0.0 | - | | | Wood debris and Slag. | |
| | | | | | | | | | | | Yellow-brown (10YR 5/4) SILT, few to little Clay, no odor, moderately dense, aplastic, wet to moist. | |
| | | 6 | 11-13 | 4 7 7 9 | 14 | 1.66 | 485 | + | CL | | Yellow-brown (10YR 5/4) with gray (10YR 5/1) mottling Silty lean CLAY, few fine to medium subrounded to subangular Sand, no odor, very stiff to stiff, weakly plastic, moist. Clay Till. | SILTY CLAY |
| | | | | | | | | | | | Silt lens 4" wide as from 9.8-10.1' bgs, but strong odor from 12.5' to lower contact. Oily sheen also present. | |
| | | 7 | 13-15 | 4 5 10 10 | 15 | 1.8 | 2091 | + | | | Saturated Silt lens 4" wide. Strong odor. | |
| | | | | | | | | | | | Saturated Silt lens 3" wide. | |
| 15 | | 8 | 15-17 | 6 7 | 19 | 1.8 | 2050 | + | CL/ ML | | Alternating Gray (10YR 5/1) Silty CLAY lenses and SILT lenses up to 6" wide throughout to lower contact, strong odor, oily sheen, saturated. Glacial-alluvial | |

**Boring Construction**



- Portland Cement (0-1' bgs).
- Bentonite Grout Seal (1-3' bgs).
- Bentonite Seal (3-8.5' bgs).
- 2" ID PVC Riser (0-11' bgs).
- #5 Global Filter Sandpack (8.5-21.0' bgs).
- 2" ID PVC 0.010" Slotted Screen (11.0-21.0' bgs).

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs=below ground surface; *=Triple-checked
NA = Not Applicable/Not Available
+/- = Positive/Negative Test Result
Samples collected at 0.5-2.5'; 8-10'; 11-13' intervals.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/07/01 | 13.8' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-85-07

**Borehole Depth:** 21' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8 | 15-17 | 12 4 | 19 | 1.8 | 2050 | + | CL/ ML | | Alternating Gray (10YR 5/1) Silty CLAY lenses and SILT lenses up to 6" wide throughout to lower contact, strong odor, oily sheen, saturated. Glacial-alluvial 16.5' bgs: Increased Sand content to little fine subrounded Sand. Black oil present. | | #5 Global Filter Sandpack (8.5-21.0' bgs). |
| | | 9 | 17-19 | 4 7 9 11 | 16 | 1.8 | 0.0* | - | SW | | Gray (10YR 5/1) becoming yellow-brown (10YR 3/4) at 18' bgs fine to coarse well graded subangular to subrounded SAND, some Silt, no odor, dense, saturated. Glacial-alluvial. | SAND | 2" ID PVC 0.010" Slotted Screen (11.0-21.0' bgs). |
| 20 | | 10 | 19-21 | 7 9 14 15 | 23 | 1.5 | 0.0* | - | | | Fining downwards to a Silt. | | |
| | 725 | | | | | | | | ML | | Gray (10YR 5/1) SILT, little Clay, no odor, moderately dense, aplastic, saturated. Glacial-alluvial | | PVC Cap (21.0-21.2' bgs). |
| 25 | 720 | | | | | | | | | | | | |
| 30 | 715 | | | | | | | | | | | | |
| 35 | 710 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs=below ground surface; *=Triple-checked
NA = Not Applicable/Not Available
+/- = Positive/Negative Test Result
Samples collected at 0.5-2.5'; 8-10'; 11-13' intervals.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 11/07/01 | 13.8' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/23/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 563482.98<br>**Easting:** 13306082.09<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 24' bgs<br>**Surface Elevation:** 743.2<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-86-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | | |
| 0 | | 1 | 0-2 | NA 1 1 1 | 2 | 1.0 | 3.3 | + | GP | | Coarse angular limestone GRAVEL and PEBBLES (fill aggregate). | FILL | Cement pad with 9" diam flush-mount cover.<br>Grout 1-1.5' bgs. |
| | 740 | 2 | 2-4 | 11 12 - - | NA | 0.8 | NA | NA | ML | | Very dark gray-brown (10YR 3/2) aplastic SILT, little fine to medium subangular Sand, few to some medium to coarse angular limestone Gravel and Pebbles, odor present, moist, loose, organic material (roots) present. Fill. | SILT | |
| 5 | | 3 | 4-6 | 1 6 6 12 | 12 | 1.0 | 3.7 | - | SP | | Yellow-brown (10YR 5/4) fine to medium subangular quartz-rich SAND, some Silt, trace Clay, few fine to coarse rounded Gravel, aplastic, dry, moderately loose, no odor. Fill.<br>At 6': Local oxidation to yellow-brown (10YR 5/8). | SAND | Bentonite seal 1.5-7' bgs. |
| | | 4 | 6-8 | 4 5 7 9 | 12 | 1.5 | 3.2 | - | | | | | 2" ID Sch. 40 PVC riser 0.2-9' bgs. |
| | 735 | 5 | 8-10 | 5 7 50/ 5" | NA | 1.4 | 3.0 | - | | | | | |
| 10 | | 6 | 10-12 | 100/ 6" | NA | 0.5 | 4.6 | - | | | Damp.<br>1/2" wide area of blackened sand, very dark brown (10YR 2/2).<br>Semi-lithified to a sandstone. | | #5 Global filter sandpack 7-22' bgs. |
| | 730 | 7 | 12-14 | 9 2 3 8 | 5 | 2.0 | NA | - | CL | | Gray (10YR 5/1) aplastic CLAY, some Silt, little fine to medium subangular Sand, trace fine to coarse rounded to subrounded Gravel, damp, moderately stiff, no odor, no oxidation present. | | 2" ID Sch. 40 PVC 0.010" slotted screen 9-19' bgs. |
| 15 | | 9 | 14-16 | 2 3 3 4 | 6 | 2.0 | NA | - | ML<br>CL | | 14.3-14.6: Gray (10YR 5/1) aplastic SILT, little to some Clay, few fine subangular Sand, wet, dense, no odor.<br>14.6-16.0: Gray (10YR 2/1) CLAY, as above, but soft, moist to wet, lenses of Silt up to 1" wide throughout. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs=below ground surface;
+/- =Positive/Negative Test Result;
NA = Not Applicable/Not Available;
Samples collected 0.5-2.5', 4.5-6.5' and 8.5-10.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/23/01 | 10.5', 14.3' and 23.3 | |

**Client:**
General Motors

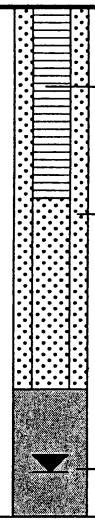
**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-86-01

**Borehole Depth:** 24' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 11 | 16-18 | 2 3 3 4 | 6 | 2.0 | 1.8 | - | CL | | 16.0-23.3: Gray (10YR 5/1) CLAY, as above, but soft, moist to wet, lenses of Silt up to 1" wide throughout. | CLAY |
| | 725 | 13 | 18-20 | 2 3 4 5 | 7 | 2.0 | 3.7 | - | | | | |
| 20 | | 15 | 20-22 | 1 2 3 5 | 5 | 2.0 | 4.1 | - | | | | |
| | 720 | 17 | 22-24 | 2 6 8 8 | 14 | NA | 2.1 | - | SP | | Brown (10YR 5/3) fine to coarse subangular SAND, little Silt and fine to coarse rounded to subrounded Gravel, aplastic, wet, loose. (Riverine/alluvial sand) | SAND |
| 25 | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | |
| 30 | | | | | | | | | | | | |
| | 710 | | | | | | | | | | | |
| 35 | | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs=below ground surface;
+/- =Positive/Negative Test Result;
NA = Not Applicable/Not Available;
Samples collected 0.5-2.5', 4.5-6.5' and 8.5-10.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/23/01 | 10.5', 14.3' and 23.3 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/27/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 45B | **Northing:** 563015.27<br>**Easting:** 13306187.56<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 27' bgs<br>**Surface Elevation:** 735.5<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-86-01R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 735 | | | | | | | | GP | | Coarse angular limestone GRAVEL and PEBBLES (fill aggregate). | FILL | Cement pad with 9" diam flush-mount cover. |
| | | | | | | | | | ML | | Very dark gray-brown 10 YR 3/2 aplastic SILT, little fine to medium subangular Sand, few to some medium to coarse angular limestone Gravel and Pebbles, odor present, moist, loose, organic material (roots) present (Fill). | | Grout 0.5-17.5' bgs. |
| 5 | 730 | | | | | | | | SP | | Yellow-brown 10 YR 5/4 fine to medium subangular quartz-rich SAND, some Silt, trace Clay, few fine to coarse rounded Gravel, aplastic, dry, moderately loose, no odor. (Fill)<br>Local oxidation to yellow-brown 10 YR 5/8. | | 2" ID Sch. 40 PVC riser 0.1-19' bgs. |
| 10 | 725 | | | | | | | | | | Damp.<br>1/2" wide area of blackened sand, very dark brown 10 YR 2/2.<br>Semi-lithified to a sandstone. | | |
| | | | | | | | | | CL | | Gray 10 YR 5/1 aplastic CLAY, some Silt, little fine to medium subangular Sand, trace fine to coarse rounded to subrounded Gravel, damp, moderately stiff, no odor, no oxidation present. | CLAY | |
| | | | | | | | | | ML | | (14.3-14.6) Gray 10 YR 5/1 aplastic SILT, little to some Clay, few fine subangular Sand, wet, dense, no odor. | | |
| 15 | 720 | | | | | | | | CL | | (14.6-16.0) Gray 10 YR 2/1 CLAY, as above, but soft, moist to wet, lenses of Silt up to 1" wide throughout. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
See boring log RFI-86-01 for 0-20' sampling information.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/27/01 | 23.1' | |

**Client:**
General Motors

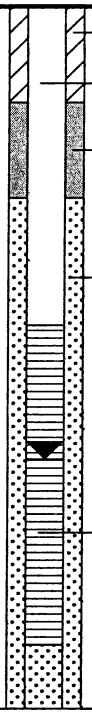
**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-86-01R

**Borehole Depth:** 27' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | CL | Gray 10 YR 5/1 CLAY, as above, but soft, moist to wet, lenses of Silt up to 1" wide throughout. | CLAY |
| 20 | 715 | 1 | 20-22 | 2 2 4 8 | 6 | 1.8 | 0.0 | - | | Gray (10 YR 5/1) SILTY CLAY, few fine subangular to subrounded Sand, medium stiff to stiff, moderately plastic, damp to moist, no odor. Intermittant gray (10 YR 5/1) wet to saturated silt seams up to 5" wide throughout. | SILTY CLAY |
| | | 2 | 22-24 | 3 5 2 6 | 12 | 1.7 | 0.0 | - | | | |
| 25 | 710 | 3 | 24-27 | 3 4 5 6 | 9 | 1.6 | 0.0 | - | SP | Dark yellow-brown (10 YR 5/6) fine to coarse subrounded SAND, little Clay, little Silt, fine to medium rounded Gravel, aplastic, loose, saturated, no odor. Alluvial-riverine. at 24': Gray (10 YR 6/1) fine to coarse rounded Gravel, decreased clay to few to trace, decreased silt to few, bits of shells present. Overdrilled to 27' bgs. | SAND |
| 30 | 705 | | | | | | | | | | |
| 35 | 700 | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
See boring log RFI-86-01 for 0-20' sampling information.

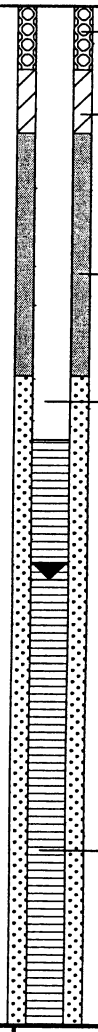
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/27/01 | 23.1' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/31/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 563154.66<br>**Easting:** 13306221.18<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 17' bgs<br>**Surface Elevation:** 735.65<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-86-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 735 | NA | 0-3 | NA | NA | NA | NA | NA | FILL | | Coarse gravel- to cobble-size angular FILL, mixed with gray-brown Silty Sand. Topsoil. | FILL |
| | | 1 | 3-5 | 6 13 18 15 | 28 | 1.3 | 2631 | + | SM | | Yellow-brown (10 YR 5/6) aplastic Silty fine subangular to subrounded SAND, trace Clay, no odor, dense, damp, locally varved. Fill. | SILTY SAND |
| 5 | 730 | 2 | 5-7 | 6 7 8 8 | 15 | 1.5 | 1673 | + | | | | |
| | | 3 | 7-9 | 3 5 7 10 | 12 | 1.8 | 3319 | + | SP | | Yellow-brown (10 YR 5/4) aplastic fine to medium subangular to subrounded SAND, little to some Silt, trace fine to medium rounded Gravel, no odor, moderately dense, moist. Glacial-alluvial.<br>at 7': Increased clay to trace, no gravel, weak odor. | SAND |
| 10 | 725 | 4 | 9-11 | 4 5 6 7 | 11 | 1.8 | 512 | + | | | Color change to gray (10 YR 6/1) moderate odor, oily, saturated, sticky amber product observed throughout to 17' bgs. | |
| | | 5 | 11-13 | 3 5 9 6 | 14 | 1.8 | 30.1 | + | | | Increased coarseness to fine to medium subrounded to subangular Sand, shell fragments. | |
| 15 | 720 | 6 | 13-15 | 3 5 5 6 | 10 | 1.2 | 212 | + | ML | | Brown (10 YR 5/3) with varved oxidation to yellow-brown (10 YR 5/6) aplastic SILT, trace to little fine subangular to subrounded Sand, moderate odor, damp to moist, dense.<br>Saturated with water and oil, oily sheen with "peacock" coloration throughout. | SILT |
| | | 7 | 15-17 | 2 2 | 5 | 1.8 | 0.0 | + | | | | |

**Boring Construction**



- Cement pad with 9" diam flush-mount cover.
- Grout 1-2' bgs.
- Bentonite seal 2-5.8' bgs.
- 2" ID Sch. 40 PVC riser 0.2-6.8' bgs.
- #5 Global filter sandpack 5.8-17' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 6.8-16.8' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; + = Positive Test Result;
NA = Not Applicable/Not Available.
Samples collected 1-3' and 7-9' bgs.
+/- = Positive/Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/31/01 | 9.0' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-86-02

**Borehole Depth:** 17' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 7 | 15-17 | 3<br>6 | 5 | 1.8 | 0.0 | + | ML | | Increased clay to some, decreased moisture to moist to damp. | SILT | 2" ID Sch. 40 PVC 0.010" slotted screen 6.8-16.8' bgs.<br>#5 Global filter sandpack 5.8-17' bgs. |
| 20 | 715 | | | | | | | | | | | | |
| 25 | 710 | | | | | | | | | | | | |
| 30 | 705 | | | | | | | | | | | | |
| 35 | 700 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; + = Positive Test Result;
NA = Not Applicable/Not Available.
Samples collected 1-3' and 7-9' bgs.
+/- = Positive/Negative Test Result.

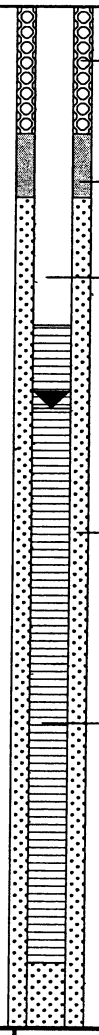
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/31/01 | 9.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/20/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Campeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 563314.49<br>**Easting:** 13306250.69<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 736.62<br><br>**Descriptions By:** S. Kerr | **Boring ID:** RFI-86-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 735 | 1 | 0-2 | NA NA | NA | NA | NA | NA | GP | | GRAVEL (fill). | GRAVEL |
| | | 2 | 2-4 | 2 4 4 6 | 8 | 1.4 | 4913 | - | CL | | Light brownish-gray (10 YR 6/3) CLAY, little Silt, trace fine Sand, hard, dense, local oxidation, highly plastic, no odor, dry to damp. | CLAY |
| 5 | | 3 | 4-6 | 9 16 30 26 | 36 | 1.6 | 1376 | + | | | Some Silt and moist. | |
| | 730 | 4 | 6-8 | 6 11 10 12 | 21 | 1.4 | 1511 | + | SP | | Light yellowish (10 YR 6/4) fine to medium SAND, little Silt, moderately dense, no odor, damp, oxidation throughout. | SAND |
| | | | | | | | | | | | Grayish brown fine to medium SAND. Trace Silt. No oxidation, saturated, loose, slight odor. | |
| | | 5 | 8-10 | 3 4 5 9 | 9 | 1.2 | 8261 | - | | | Yellowish brown (10 YR 5/6) fine to medium SAND, no odor. | |
| 10 | 725 | 6 | 10-12 | 2 4 4 3 | 8 | 1.8 | >9999 | - | | | | |
| | | | | | | | | | ML | | Yellowish brown (10 YR 5/6) SILT, little fine Sand, loose, saturated, no odor. | SILT |
| | | 7 | 12-14 | 2 2 3 7 | 5 | 1.9 | 4040 | - | CL | | Light brownish gray (10 YR 6/2) Silty CLAY with Silt seams up to 2" thick throughout, some fine Sand, moderately dense, saturated, no odor, soft, local oxidation. | CLAY |
| | | | | | | | | | SP | | Yellowish-brown fine to medium SAND, some Silt, loose, saturated, no odor. | SAND |
| 15 | | 8 | 14-16 | 2 2 2 3 | 4 | 1.5 | >9999 | - | CL | | Gray CLAY (10 YR 5/1), little SILT, soft, moist, no odor. Clay Till. | CLAY |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
+/- = Positive/Negative Test Result.
Samples collected 2-4' and 4-6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/20/01 | 6.3' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-86-03

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 720 | 9 | 16-18 | 2 2 3 4 | 5 | 1.8 | 4339 | + | CL | | Gray CLAY (10 YR 5/1), little SILT, soft, moist, no odor. Clay Till. | ← CLAY → | Global #5 sandpack 3-18' bgs. |
| 20 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 710 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 705 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
+/- = Positive/Negative Test Result.
Samples collected 2-4' and 4-6' bgs.

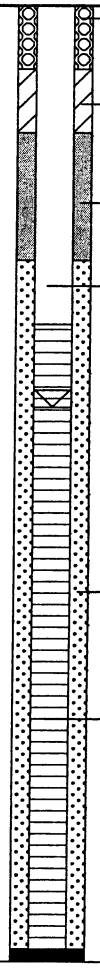
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 06/20/01 | 6.3' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 07/24/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2"x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 563438.32<br>**Easting:** 13306266.08<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 15' bgs<br>**Surface Elevation:** 737.29<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-86-04<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | |
| 0 | | | 0-1 | NA | NA | NA | NA | NA | SM (fill) | Dark gray-brown (10YR 4/2) plastic Silty SAND, fine to coarse subangular to subrounded Sand, trace to few Clay, some coarse grained, mostly Gravel (Fill), dry, no odor, moderately loose. Few roots and vegetation present. Aggregate Fill. | SILTY SAND |
| | 735 | 1 | 1-3 | 4 4 5 4 | 9 | 1.0 | 6941 | - | SM | | |
| | | 2 | 3-5 | 4 5 7 6 | 12 | 1.0 | 4461 | - | | Yellow-brown (10YR 5/6) Silty SAND, fine subangular to subrounded Sand, moist to damp, no odor, moderately dense. Perched water. | |
| 5 | | | | | | | | | SP | Reddish aplastic fine to coarse subrounded to subangular SAND, some Silt, no odor, damp, moderately dense to moderately loose. | SILTY SAND |
| | | 3 | 5-7 | 4 5 6 6 | 11 | 1.7 | 1161 | - | SM | Very pale brown (10YR 8/3) aplastic fine to coarse subangular SAND, some to little Silt, no odor, damp, loose. Brown (10YR 5/3) Silty SAND, fine to coarse (predominately fine) subangular to subrounded Sand, trace Clay, aplastic, no odor, moist, moderately loose to moderately dense. | |
| | 730 | 4 | 7-9 | 5 5 5 5 | 10 | NA | 287 | - | ML | Gray (10YR 5/1) aplastic SILT with fine subangular to subrounded Sand, no odor, moderately dense, saturated. | SILT |
| 10 | | 5 | 9-11 | 4 4 5 4 | 9 | 1.4 | 122 | - | | Yellow-brown (10YR 5/4) aplastic SILT, little subangular to subrounded Sand, few to trace Clay, locally oxidized to reddish-brown, no odor, moderately loose to moderately dense, saturated. | |
| | 725 | 6 | 11-13 | 2 2 3 2 | 5 | 2.0 | 191 | - | CL | Gray (10YR 6/1) soft Silty CLAY, trace fine subangular to subrounded Sand, no odor, saturated, soft. Local Silt seams and lenses up to 2" wide throughout as at 8 - 11' bgs, but gray (10YR 6/1). Clay Till. | SILTY CLAY |
| | | 7 | 13-15 | 1 1 3 5 | 4 | NA | 0.0 | - | | Decrease in quantity and width of Silt lenses, moist to damp. | |
| 15 | | | | | | | | | | | |

Boring Construction




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Background PID = 0.0 ppm
Samples collected 1-3' and 3-5' bgs.

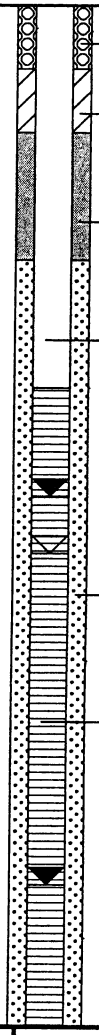
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/24/01 | 6.3' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 06/20/01<br>**Drilling Company:** Rau Drillling<br>**Driller's Name:** Rod Champeron<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** NA<br>**Rig Type:** CME 45B | **Northing:** 563493.09<br>**Easting:** 13306103.53<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 19' bgs<br>**Surface Elevation:** 742.47<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-86-05<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 8 9 9 15 | 18 | 1.2 | 252 | + | FILL | | Concrete | Fill |
| | | | | | | | | | | | Black (10 YR 2/1) fine to coarse sand sized SLAG. No odor, plastic, moderately dense, dry. | |
| | | | | | | | | | | | Very dark brown (10 YR 2/2) SILT. Aplastic, no odor, dry to damp, moderately dense. Stained fill sand. | SILT |
| | 740 | 2 | 2-4 | 3 3 2 3 | 5 | 0.5 | 483 | - | | | SLAG as described at 0.9'-1.2 bgs. | SAND |
| 5 | | 3 | 4-6 | 4 6 3 2 | 9 | 1.2 | 273 | - | SM | | Yellow brown (10 YR 5/6) mottled to dark brown (10 YR 3/3) fine to medium SILTY SAND. No odor, dry, dense to moderately loose. Fill. At 5.7' bgs, moist and glass shards present. | SILTY CLAY |
| | 735 | 4 | 6-8 | 2 2 4 6 | 6 | NA | 330 | - | CL | | Yellow brown (10 YR 5/4) SILTY CLAY. Little fine subangular Sand. No odor, soft, damp to moist. Fill. | |
| 10 | | 5 | 8-10 | 5 5 6 5 | 11 | 1.7 | 193 | - | | | Gray (10 YR 6/1) CLAY. Some Silt. Little fine to medium subrounded to subangular Sand. Trace fine to medium subrounded Gravel. Soft to moderately stiff, damp. Local oxidation and mottled to yellow brown (10 YR 5/4). Native glacial till used as backfill. | SILT with CLAY Layers |
| | | | | | | | | | | | Yellow brown (10 YR 5/4) SILT. Little fine subangular Sand. Aplastic, no odor, wet (saturated), moderately dense Fill. | |
| | | 6 | 10-12 | 5 10 12 12 | 22 | 1.8 | 101 | - | | | CLAY as above ( 8.1'-8.6' bgs). | |
| | | | | | | | | | | | SILT as above ( 8.6'-10.1' bgs). | |
| | | | | | | | | | | | CLAY as above ( 8.1'-8.6' bgs), but damp. Moderately stiff to very stiff. | |
| | 730 | 7 | 12-14 | 3 7 14 19 | 21 | 1.8 | 190 | - | ML | | Pale brown SILT ( 10 YR 6/3) . Little fine subangular Sand. No odor, saturated, aplastic, dense. Alluvial/ Riverine deposit. | |
| | | | | | | | | | | | CLAY as above ( 8.1'-8.6' bgs). Damp and hard | |
| 15 | | 8 | 14-16 | 4 9 9 10 | 18 | 1.8 | 83.2 | - | | | SILT as above (11.2'-13.4' bgs) but grey (10 YR 6/1) with mottling and oxidation to yellow brown (10 yr 6/4) until 17.0' bgs. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
+/- = Positive/Negative Test Result
Samples collected 1-3', 3-5' and 5-7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/20/01 | 7.7', 8.6', 13.8' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-86-05

**Borehole Depth:** 19' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 725 | 9 | 16-18 | 6<br>7<br>14<br>12 | 21 | NA | 174 | - | ML | | SILT as above (11.2'-13.4' bgs) but grey (10 YR 6/1) with mottling and oxidation to yellow brown (10 yr 6/4) until 17.0' bgs. | SILT | #5 Global filter sandpack 4-19' bgs. |
| | | 10 | 18-19 | NA | NA | NA | NA | NA | | | | | |
| 20 | | | | | | | | | | | | | |
| | 720 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 710 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
+/- = Positive/Negative Test Result
Samples collected 1-3', 3-5' and 5-7' bgs.

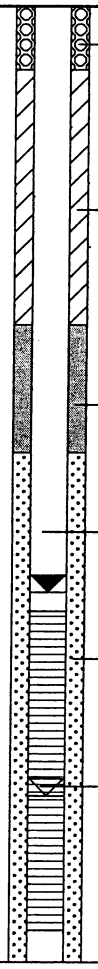
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/20/01 | 7.7', 8.6', 13.8' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/15/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 563158.14<br>**Easting:** 13306355.29<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 15' bgs<br>**Surface Elevation:** 737.32<br><br>**Descriptions By:** SM DULY | **Boring ID:** RFI-86-06S<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | | |
| 0 | | | | | | | | | GP | | Coarse predominantly limestone subangular GRAVEL. Fill, dry, loose, no odor. | GRAVEL |
| | 735 | | | | | | | | CL | | Gray (10YR 6/1) soft CLAY, some Silt, little fine to medium subangular Sand, no odor, soft to medium stiff, damp to locally moist.<br><br>3.4-4.0': some silt-sized to medium gravel-sized fragments of anthracite coal.<br><br>5.2-5.7': Gravel as above (0-2.0' bgs). | CLAY |
| 5 | | | | | | | | | | | | |
| | 730 | | NA | NA | NA | NA | NA | NA | ML | | Black (10YR 2/1) SILT, some fine subangular Sand, aplastic, no odor, damp, moderately loose to moderately dense. Foundry Sand and Fill - glass shards also present. Becomes grey brown at 8.0'bgs and pale brown at at 8.2'bgs. Clean Fill. | SILT |
| 10 | | | | | | | | | SM | | Brown grey (10YR 6/2) fine to medium subangular Silty SAND, no odor, loose, aplastic, damp, moist at 11.5'bgs. Fill.<br><br>Moist.<br><br>Saturated, increased coarseness to medium-grained, color change to brown (10 YR 5/3). | SILTY SAND |
| | 725 | | | | | | | | CL | | CLAY, some Silt, soft, no odor, damp. | CLA |
| 15 | | | | | | | | | | | | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Available
Geologic description from RFI-86-06D, located 2.5' to west.
Blind drilled to 15' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/15/01 | 9.2', 12.4' | |

| | | |
|---|---|---|
| **Date Start/Finish:**<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** 563158.06<br>**Easting:** 13306357.65<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 26' bgs<br>**Surface Elevation:** 737.21<br><br>**Descriptions By:** SM Duly / Sean Kerr | **Boring ID:** RFI-86-06 D<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | | | |
| 0 | | 1 | 0-2 | | | NA | NA | NA | GP | | Coarse predominantly limestone subangular GRAVEL. Fill, dry, loose, no odor. | GRAVEL | Cement pad with 9" diam. flush-mount cover. |
| | 735 | 2 | 2-4 | | | 1.5 | 129 | - | CL | | Grey (10 YR 6/1) soft CLAY, some Silt, little fine to medium subangular Sand, no odor, soft to medium stiff, damp to locally moist. Clay Till.<br>3.4-4.0': Some silt-sized to medium gravel-sized fragments of anthracite coal. | CLAY | |
| 5 | | 3 | 4-6 | | | 1.3 | 307 | - | | | 5.2-5.7': Gravel, as above (0-2.0' bgs). | | 2" ID Sch. 40 PVC riser 0.2-14.5' bgs. |
| | 730 | 4 | 6-8 | | | 1.8 | 15.0 | - | ML | | Black (10 YR 2/1) SILT, some fine subangular Sand, aplastic, no odor, damp, moderately loose to moderately dense. Foundry Sand. Fill - glass shards also present. Becomes grey brown at 8.0'bgs and pale brown at at 8.2'bgs. Clean Fill. | SILT | Grout 1.2-10.5' bgs. |
| | | 5 | 8-10 | | | 1.8 | 1276 | - | | | | | |
| 10 | | 6 | 10-12 | | | 1.6 | 3465 | - | SM | | Brown gray (10 YR 6/2) fine to medium subangular Silty SAND, no odor, loose, aplastic, damp, moist at 11.5' bgs.<br>Moist. | SILTY SAND | Bentonite seal 10.5-12.5' bgs. |
| | 725 | 7 | 12-14 | | | 1.5 | 1308 | - | | | Saturated, increased coarseness to medium, color change to brown (10 YR 5/3). | | #5 Global filter sandpack 12.5-26' bgs. |
| 15 | | 8 | 14-16 | | | 1.0 | 404 | - | CL | | CLAY, some Silt, soft, no odor, damp. | CLAY | 2" ID Sch. 40 PVC 0.010" slotted screen 14.5-24.5' |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
- = Negative Test Result.
NA=Not Available/Not Applicable.
Samples collected 2-4' and 6-8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |

**Client:**
General Motors

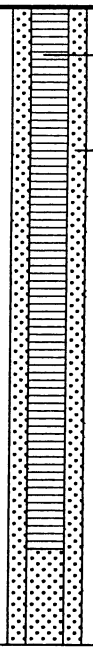
**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-86-06 D

**Borehole Depth:** 26' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | CL | CLAY, some Silt, soft, no odor, damp. | |
| | | | | | | | | | | SILT lens, saturated. | SILT |
| | 720 | 9 | 16-18 | | | 2 | 82.7 | - | | SILT as above (16.5'-16.7'), but with little fine to medium subrounded to subangular Sand, few coarse Gravel, moist. Clay Till. At 18.0' bgs, intermittent saturated Silt lenses up to 2" wide throughout. | |
| | | 10 | 18-20 | | | 2 | 109 | - | | | |
| 20 | | | | | | | | | ML | | |
| | | 11 | 20-22 | | | 1.8 | 940 | - | | Grey (10 YR 6/1) SILT, some CLAY, no odor, saturated, moderately loose, locally oxidized to yellow brown at 22.9' bgs. Till. | |
| | 715 | 12 | 22-24 | | | 1.6 | 121 | - | | | |
| | | | | | | | | | SP | Grey brown fine to coarse subangular SAND, some to little Silt, no odor, saturated, loose. Alluvial deposit. High energy environment of deposition. | SAND |
| 25 | | 13 | 24-26 | | | 1.5 | 123 | - | CL | Grey (10 YR 5/1) CLAY, some Silt, little fine to medium subangular Sand, few fine to medium subrounded Gravel, no odor, dry, hard. Clay Till. | CLAY |
| | 710 | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| | 705 | | | | | | | | | | |
| 35 | | | | | | | | | | | |

**Boring Construction**



bgs

2" ID Sch. 40 PVC 0.010" slotted screen 14.5-24.5' bgs

#5 Global filter sandpack 12.5-26' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
- = Negative Test Result.
NA=Not Available/Not Applicable.
Samples collected 2-4' and 6-8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/23/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-86-07<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | | | | | |
| | | 1 | 0-2 | - 3 8 11 | 11 | 1.0 | 3.1 | - | FL | | CONCRETE. | FILL | |
| | | 2 | 2-4 | 9 9 8 11 | 17 | 1.6 | 3.1 | - | SP | | Yellow-brown (10YR 5/8) fine to coarse (predominantly fine to medium) subangular SAND, some Silt, trace fine to medium rounded to subrounded Gravel, aplastic, dry, loose, no odor. | | Borehole backfilled with Bentonite Chips to grade. |
| | | | | | | | | | CL | | Gray-brown (10 YR 5/2) CLAY, some Silt, little fine to coarse subangular black sand-sized Slag?, trace rounded Gravel, locally mottled and oxidized to yellow-brown (10YR 5/4), dry, soft to moderately stiff (pp=2 tons/sq. feet), no odor. | SAND | |
| 5 | 5 | 3 | 4-6 | 3 6 9 9 | 15 | 1.5 | 2.0 | - | SP | | Yellow-brown SAND, as above, little Clay, moderately loose to moderately dense. At 5.1': Decreased Clay content to few. | | |
| | | | | | | | | | ML | | Yellow-brown (10 YR 5/6) SILT, few fine to medium subangular Sand, little Clay, dry, very dense, aplastic, no odor. | SILT & CLAY | |
| | | 4 | 6-8 | 6 3 3 3 | 6 | 2.0 | 1.3 | - | CL | | Gray (10 YR 5/1) CLAY, some Silt, little fine to medium subangular to subrounded Sand, trace fine to coarse rounded to subrounded Gravel, damp, moderately stiff, locally mottled to yellow-brown with oxidation. Till. | | |
| | | | | | | | | | SP | | Yellow-brown (10 YR 5/6) SAND, as at 3.6'-6.3', some Clay, moist. | SILT & CLAY | |
| | | 5 | 8-10 | 2 3 5 6 | 8 | 2.0 | 2.4 | - | CL | | Gray (10YR 5/1) CLAY, as above, very stiff to 9.6' bgs, then soft to lower contact. Minor oxidation between 8.8'-10.5' and increasing slightly at 10.5' bgs. At 10.7' bgs a 1" wide Sand (SP) seam as at 8'-8.5' bgs, some Silt. | | |
| 10 | 10 | | | | | | | | | | | | |
| | | 6 | 10-12 | 1 3 4 4 | 7 | 2.0 | 4.7 | - | ML | | Gray (10YR 5/1) aplastic SILT, some Clay and locally soft with patches of increased clay content, few fine subangular Sand, wet, dense, no odor. At 13.6': Increased Gravel and Sand content to little, fine to coarse subangular Sand and Gravel. | | |
| | | 7 | 12-14 | 19 50/ 3" | NA | 1.0 | 3.2 | - | | | | | |
| 15 | 15 | 9 | 14-16 | 12 25 25 26 | 50 | 2.0 | 3.6 | - | CL | | Dark gray (10 YR 4/1) CLAY, some Silt, little fine to medium subangular to subrounded Sand, few fine to coarse rounded to subrounded Gravel, dry, hard, no odor. Clay Till. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; - = Negative Test Result
NA=Not Applicable/Not Available; pp=pocket penetrometer.
Temporary well screen placed 5 to 15' bgs.
Samples collected 0.7-2.7' and 8.7-10.7' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/23/01 | 11.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 7/20/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Tom Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** NA<br>**Auger Size:** NA<br>**Rig Type:** Geoprobe | **Northing:** 563359.12<br>**Easting:** 13306188.42<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 21' bgs<br>**Surface Elevation:** 743.54<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-86-08<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 745 | | | | | | | | | | |
| 0 | | | | | | | FL | | CONCRETE. | | |
| | | 1 | 0-2 | 1.4 | 11.2 | - | ML | | Dark yellowish-brown (10YR 3/4) SILT, some fine to coarse Sand, trace clay, no odor, trace fine to coarse Gravel, trace Slag, loose, dry. Fill. | SILT | Borehole backfilled with Bentonite to grade. |
| | 740 | 2 | 2-4 | 1.0 | NA | - | | | | | |
| 5 | | 3 | 4-6 | 1.3 | NA | - | | | | | |
| | | 4 | 6-8 | 1.3 | NA | - | | | | | |
| | | | | | | | SM | | Very pale brown (10YR 8/2) cemented fine SAND, some medium Sand, dry, no odor. Fill. | Layered SILT AND CLAY | |
| | | | | | | | CL | | Light olive-brown (2.5Y 6/3) CLAY, some fine to medium Sand, Brick fragments, coarse Gravel in tip. Fill. | | |
| | 735 | 5 | 8-10 | 2.0 | NA | - | ML | | Yellowish-brown (10YR 5/6) SILT, moderately loose, trace fine Sand, dry, no odor. | | |
| | | | | | | | CL | | CLAY, as at 7.6' - 8.2' bgs. | | |
| | | | | | | | ML | | SILT, as at 8.2' - 8.5' bgs, dense and moist. | | |
| 10 | | 6 | 10-12 | 1.5 | NA | - | CL | | Black (10YR 2/1) SILT, some fine to medium Sand, trace Clay, some Slag, trace fine to coarse Gravel, moderately dense, damp. Fill. | | |
| | | | | | | | ML | | Dark-grayish brown (10YR 4/2) CLAY, some fine to medium Sand, little Silt, moderately plastic, damp, no odor, oxidation throughout. | | |
| | | | | | | | CL | | Light olive-brown (5/4) SILT, trace Clay, trace fine Sand, trace coarse rounded Gravel, moist, no odor, oxidized, aplastic. | | |
| | | 7 | 12-14 | 2.0 | NA | + | | | Gray (10YR 5/1) CLAY, some fine to coarse Sand, Silt seams up to 2", moist, oxidized, no odor, stiff, low plasticity, saturated. Clay Till. | | |
| | 730 | | | | | | SM | | Dark gray fine to medium SAND, some Silt, saturated, loose, slight odor. Glacial-alluvial. | SAND | |
| 15 | | 8 | 14-16 | 2.0 | NA | + | CL | | Grayish-brown (10YR 5/2) CLAY, some Silt, low plasticity, stiff, moist, no odor. Clay Till. | | |
| | | | | | | | ML | | Light olive-brown (2.5Y 5/3) SILT, trace fine Sand, moist to wet, dense, | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs=below ground surface;
+/- =Positive/Negative Test Result;
NA = Not Applicable/Not Available.
Temporary well set at 19' bgs, screened 9-19' bgs.
Samples collected 0.6-2.6', 8.6-10.6' and 10.6-12.6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/20/01 | 13.7' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-86-08

**Borehole Depth:** 21' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ML | | no odor. Light olive-brown (2.5Y 5/3) SILT, trace fine Sand, moist to wet, dense, no odor. Glacial-alluvial. | Layered SILT and CLAY | |
| | | 9 | 16-18 | 1.5 | NA | + | CL | | Gray (10YR 5/1) CLAY, Silt seams 1" to 1.5", stiff, damp, slight odor, saturated, moderately plastic. Clay Till. | | Borehole backfilled with Bentonite to grade. |
| | 725 | | | | | | | | | | |
| 20 | | 10 | 18-21 | 2.0 | NA | + | ML | | Gray (10YR 5/1) SILT, trace fine Sand, moderately dense, saturated, slight odor. Glacial-alluvial. | | |
| | | | | | | | CL | | Gray (10YR 5/1) CLAY, plastic, soft, moist, no odor. Clay Till. | | |
| | | | | | | | ML | | Gray SILT as above from 19' - 20.2' bgs. Glacial-alluvial. | | |
| | 720 | | | | | | | | | | |
| 25 | | | | | | | | | | | |
| | 715 | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| | 710 | | | | | | | | | | |
| 35 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

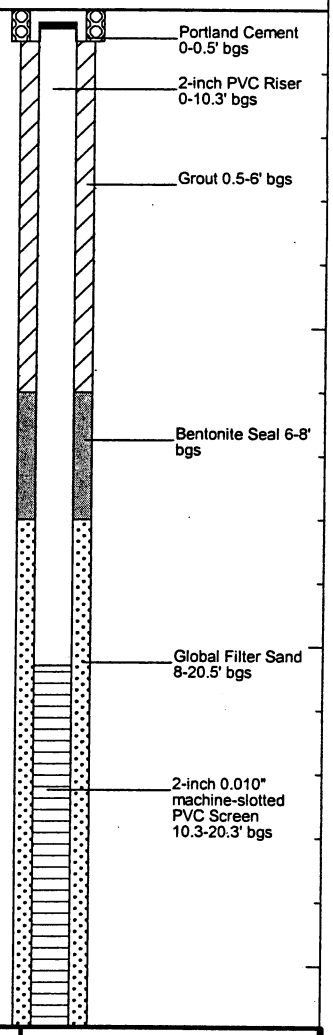
**Remarks:** bgs=below ground surface;
+/- =Positive/Negative Test Result;
NA = Not Applicable/Not Available.
Temporary well set at 19' bgs, screened 9-19' bgs.
Samples collected 0.6-2.6', 8.6-10.6' and 10.6-12.6' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 7/20/01 | 13.7' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/28/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** Hollow Stem Auger<br>**Sampler Size:** NA<br>**Auger Size:** 3-1/4" ID HSA<br>**Rig Type:** CME 45B | **Northing:** 563359.15<br>**Easting:** 13306188.43<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20.5' bgs<br>**Surface Elevation:** 743.58<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-86-08R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | NA | NA | NA | NA | NA | NA | | No Samples Taken. See log for RFI-86-08 for sampling information. | | |
| 5 | 5 | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | |




BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

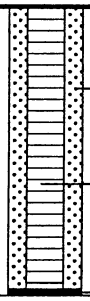
**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-86-08R

**Borehole Depth:** 20.5' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 20 | NA | NA | NA | NA | NA | NA | | No Samples Taken. See log for RFI-86-08 for sampling information. | | Global Filter Sand 8-20.5' bgs; 2-inch 0.010" machine-slotted PVC Screen 10.3-20.3' bgs; PVC Cap |
| 25 | 25 | | | | | | | | End of boring at 20.5' bgs. Light oil sheen throughout and weak odor from cuttings. | | |
| 30 | 30 | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | |



BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/21/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Champeron<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** | **Northing:** 562991.00<br>**Easting:** 13306445.40<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 8.5' below grade<br>**Surface Elevation:** 718.05<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-86-10<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | GP | | Coarse angular limestone GRAVEL and PEBBLES (fill aggregate). | | |
| | | NA | NA | NA | NA | NA | NA | NA | ML | | Very dark gray-brown (10YR 3/2) aplastic SILT, little fine to medium subangular Sand, few to some medium to coarse angular limestone Gravel and Pebbles, odor present, moist, loose, organic material (roots) present. Fill. | SILT | Borehole backfilled with bentonite to grade. |
| 5 | 5 | | | | | | | | | | | | |
| | | 1 | 6.5-8.5 | 5<br>4<br>8<br>9 | 12 | 1.3 | NA | NA | SM | | Yellow-brown (10YR 4/6) Silty SAND, fine subangular Sand, few Clay, poorly graded, no odor, dense, aplastic, dense. | Silty SAND | |
| 10 | 10 | | | | | | | | | | | | |
| 15 | 15 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Sample collected 6.5-8.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/21/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Chaperon<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 563007.09<br>**Easting:** 13306134.2<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 4.7'bgs<br>**Surface Elevation:** 737.1<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-86-11<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | | | |
| 0 | | | | | | | | | FL | | CONCRETE (Reinforced). | FILL | |
| | 735 | 1 | 0.7-3.5 | 3<br>6<br>8<br>7 | 14 | 1.4 | NA | NA | SM | | Yellow-brown (10YR 5/4) fine subangular Silty SAND, few Clay, poorly graded, no odor, dense, aplastic, damp. Highly oxidized. | SILTY SAND | Borehole backfilled with bentonite to grade. |
| | | 2 | 3.5-4.7 | 5<br>5<br>9<br>9 | 14 | 1.3 | NA | NA | CL | | Gray (10YR 5/1) lean Silty CLAY, few fine subangular Sand, no odor, very stiff, weakly plastic, dry. | | |
| | | | | | | | | | SM | | Yellow-brown (10YR 5/4) fine subangular Silty SAND, few Clay, poorly graded, no odor, dense, aplastic, damp. Highly oxidized. | | |
| 5 | | | | | | | | | | | | | |
| | 730 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.7-2.7' and 2.7-4.7' bgs.

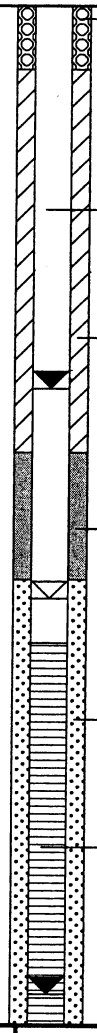
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 6/15/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 3 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** 13306072.15<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** 738.11<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-86-12<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | | |
| 0 | | | 0-4 | NA | NA | NA | NA | NA | FL | | Coarse subangular to angular GRAVEL, loose, no odor, dry (Fill) mixed with silt to cobble-sized angular black fragments of anthracite coal. Also mixed with little Silt and occasional vegetation and roots (topsoil). | FILL |
| | 735 | | | | | | | | | | Wood - possible old railroad ties. | |
| 5 | | 1 | 4-6 | 4 7 8 12 | 15 | 2.0 | 4891 | + | SP | | Black (10 YR 2/1) fine to coarse angular sand-sized anthracite COAL, little Silt, little fine to medium angular Gravel (predominantly coal), aplastic, moderately dense, no odor, damp to moist. | |
| | | 2 | 6-8 | 4 3 3 4 | 6 | 2.0 | 6464 | - | | | Saturated. | |
| | 730 | 3 | 8-10 | 1 1 3 4 | 4 | 1.6 | 2349 | - | | | Gray (10 YR 5/1) with dark yellow-brown (10 YR 4/4) oxidation and mottling CLAY, some Silt, little fine to medium subangular to subrounded Sand, few fine to medium subrounded Gravel, medium stiff, no odor, moist.<br>8.6-8.8': Lens of silt- to medium gravel-sized angular anthracite coal fragments, wet.<br>9.3-9.4': Saturated silt lens. | CLAY |
| 10 | | 4 | 10-12 | 2 2 6 8 | 8 | 1.3 | 1683 | - | CL | | Decreased mottling, gray (10 YR 5/1).<br>1" wide lens of anthracite coal, moist. Increased oxidation along fractures and selvages to yellow-brown (10 YR 5/4), medium stiff to stiff, moist to damp. | |
| | 725 | 5 | 12-14 | 4 5 9 10 | 14 | 1.8 | 24.7 | - | | | No oxidation present, stiff, damp. | |
| 15 | | 6 | 14-16 | 3 4 6 7 | 10 | 1.5 | 160 | - | | | Saturated silt lenses up to 1" wide, stiff to medium stiff. | |

**Boring Construction**



- Cement pad with 9" diam. flush-mount cover.
- 2" ID Sch. 40 PVC riser 0.2-10' bgs.
- Grout 1-7' bgs.
- Bentonite seal 7-9' bgs.
- #5 Global filter sandpack 9-20' bgs.
- 2" ID Sch. 40 PVC 0.010" slotted screen 10-20' bgs.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
+/- = Positive/Negative Test Result.
Samples collected 0.8-2.8' and 2.8-4.8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/15/01 | 6.0' | |
| 6/15/01 | 9.3, 15.5' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-86-12

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 7 | 16-18 | 3 5 7 8 | 12 | 1.5 | 202 | - | CL | | Gray (10 YR 5/1) CLAY, some Silt, stiff to medium stiff, no odor, damp. Saturated SILT lense at 16.6' bgs. | CLAY | #5 Global filter sandpack 9-20' bgs. |
| | 720 | 8 | 18-20 | 3 5 6 5 | 11 | 1.5 | 394 | - | ML | | Gray (10 YR 5/1) SILT, little Clay, aplastic, moderately dense, no odor, saturated. Glacial-alluvial. | SILT | 2" ID Sch. 40 PVC 0.010" slotted screen 10-20' bgs. |
| 20 | | | | | | | | | | | | | |
| | 715 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| | 710 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| | 705 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
+/- = Positive/Negative Test Result.
Samples collected 0.8-2.8' and 2.8-4.8' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 6/15/01 | 6.0' | |
| 6/15/01 | 9.3, 15.5' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/21/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Chaperon<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:**<br>**Rig Type:** CME 55 | **Northing:** 563008.59<br>**Easting:** 13306072.15<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 4.8' bgs<br>**Surface Elevation:** 738.11<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-86-12R<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | | | |
| 0 | | | | | | | | | FL | | Reinforced CONCRETE. | FILL | |
| | | | | | | | | | | | Anthracite COAL fragments. Fill. | | |
| | | 1 | 0.8-2.8 | 7 9 9 10 | 18 | 1.8 | NA | NA | SM | | Yellow-brown (10YR 5/4) fine subangular Silty SAND, few Clay, poorly graded, no odor, dense, aplastic, damp. Heavily oxidized. Fill. | SILTY SAND | Borehole backfilled with bentonite. |
| | 735 | 2 | 2.8-4.8 | 7 6 6 5 | 12 | NA | NA | NA | | | | | |
| 5 | | | | | | | | | | | | | |
| | 730 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |
| | 725 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 11/21/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Chaperon<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2' x 2" ID<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 55 | **Northing:** 562971.81<br>**Easting:** 13306119.64<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 4.8' bgs<br>**Surface Elevation:** 737.0<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-86-13<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 740 | | | | | | | | | | | | |
| 0 | | | | | | | | | FL | | Reinforced CONCRETE. | FILL | |
| | 735 | 1 | 0.8-2.8 | 3<br>11<br>12<br>9 | 23 | 2.0 | NA | NA | ML | | Black (10YR 2/1) SILT, some fine subangular Sand, little Clay, no odor, dense, aplastic, increased Sand content to a Silty Sand (SM) in patches. Fill<br>Wood debris 1" thick. | SILT | Borehole backfilled with bentonite. |
| | | 2 | 2.8-4.8 | 5<br>8<br>8<br>7 | 16 | NA | NA | NA | CL | | Brown (10YR 5/3) lean Silty CLAY, some fill with occasional Silt seams up to 2" thick, little fine subangular Sand with local decreases in Sand content to few, no odor, moderately stiff, moderately plastic, moist becoming wet at 4.6' bgs (Perched). Clay Till. | SILTY CLAY | |
| 5 | 730 | | | | | | | | | | | | |
| 10 | 725 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
Samples collected 0.8-2.8' and 2.8-4.8' bgs.

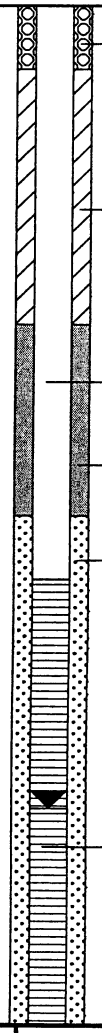
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/9/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Camperon<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2" ID x 2'<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 75 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-86-14<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | - | | | | | FL | | Concrete. | |
| | | 1 | 0-2 | 12<br>17<br>28 | 29 | 1.4 | NA | - | SP | | Yellow-brown (10 YR 5/4) fine to medium poorly-graded subangular SAND, some to little Silt, trace Clay, no odor, dry, dense to moderately dense. | FILL |
| | | 2 | 2-4 | 10<br>22<br>12<br>9 | 34 | 1.2 | NA | - | | | | |
| 5 | 5 | 3 | 4-6 | 5<br>10<br>17<br>20 | 27 | 1.8 | NA | - | CL | | Yellow-brown (10 YR 5/4) with gray (10 YR 5/1) mottling Silty CLAY, little fine to coarse subrounded to subangular Sand, few fine subrounded Gravel, weakly plastic, no odor, dry, hard to very stiff.<br>Increase in gray mottling and overall gray in color. Clay Till. | SILTY CLAY |
| | | 4 | 6-8 | 5<br>8<br>11<br>12 | 19 | 1.5 | NA | - | ML | | Gray (10 YR 5/1) SILT, some Clay, aplastic, no odor, saturated, dense. Glacial-alluvial.<br>Yellow-brown (10 YR 5/4) SILT, little Clay, aplastic, no odor, dry to damp, dense. Glacial-alluvial. | SILT |
| | | 5 | 8-10 | 4<br>9<br>9<br>9 | 18 | 1.5 | NA | - | | | 9.2-9.5': Wet. | |
| 10 | 10 | 6 | 10-12 | 4<br>6<br>7<br>8 | 13 | 1.6 | NA | - | SM | | Pale brown (10 YR 6/3) to gray (10 YR 5/1) Silty fine poorly-sorted subangular SAND, aplastic, no odor, dry, moderately dense. Glacial-alluvial. | SILTY SAND |
| | | 7 | 12-14 | 4<br>5<br>5<br>8 | 10 | 1.5 | NA | - | | | Damp to moist, becoming more gray.<br>Saturated, gray (10 YR 5/1), increased silt to a silt with sand, faint black very thin varves. | |
| 15 | 15 | 8 | 14-16 | 4<br>4<br>12<br>15 | 16 | 1.1 | NA | - | | | | |
| | | | | | | | | | SP | | Gray (10 YR 5/1) fine to coarse SAND. | |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples colleced 0.5-2.5' and 4.5-6.5' bgs.
- = Negative Test Result.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/9/02 | 12.6' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-86-14

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 5<br>11<br>18<br>27 | 29 | 1.8 | NA | - | SP<br>CL | | Gray (10 YR 5/1) fine to coarse poorly-sorted subangular to subrounded SAND, increased roundness with grain size, little Silt, few Clay, trace fine to coarse rounded to subrounded Gravel, aplastic, no odor, saturated, moderately dense. Glacial-alluvial.<br>Gray (10 YR 5/1) Silty CLAY, few fine to coarse subrounded Sand, trace fine to coarse rounded Gravel, weakly plastic, no odor, dry, hard. Native glacial clay till. | SAND | 2" ID Sch. 40 PVC 0.01" slotted screen 9-17' bgs.<br>Sand pack 8-18' bgs. |
| 20 | 20 | | | | | | | | | | | | |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
Samples colleced 0.5-2.5' and 4.5-6.5' bgs.
- = Negative Test Result.

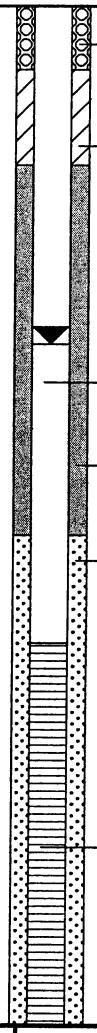
**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/9/02 | 12.6' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 1/12/02<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Camperon<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2" ID x 2'<br>**Auger Size:** 4 1/4" ID<br>**Rig Type:** CME 75 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 25' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-86-15<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | FL | | Concrete. | |
| | | 1 | 0-2 | - 4 4 4 | 8 | 1.2 | NA | - | SM | | Yellow-brown (10 YR 5/4) Silty fine to medium, predominantly fine, subangular SAND, little to few Clay confined to patches, aplastic, no odor, damp to moist, moderately dense. Fill. | SILTY SAND |
| | | 2 | 2-4 | 4 50/ 3" | NA | 0.5 | NA | - | FL | | Concrete, wet at 2.5'. | FILL |
| 5 | 5 | 3 | 4-6 | NA NA 3 1 | NA | NA | NA | - | SM | | Brown (10 YR 5/3) Silty fine poorly-graded subangular SAND, trace Clay, aplastic, no odor, moist to saturated at 5.3' bgs, moderately dense to loose. | SILTY SAND |
| | | 4 | 6-8 | 1 2 2 2 | 4 | 1.3 | NA | - | | | Increased coarseness to fine to medium subrounded to subangular Sand. | |
| | | 5 | 8-10 | woh 5 4 4 | 9 | 1.3 | NA | - | | | Becoming gray in color. | |
| 10 | 10 | 6 | 10-12 | 2 2 2 2 | 4 | 1.2 | NA | - | | | Gray-brown (10 YR 5/2) and fining downwards. Glacial-alluvial. | |
| | | 7 | 12-14 | 3 4 4 4 | 8 | 1.3 | NA | - | ML | | Gray (10 YR 5/1) SILT, some Clay, aplastic, no odor, saturated, moderately dense. Glacial-alluvial. | SILT |
| 15 | 15 | 8 | 14-16 | 3 4 6 10 | 10 | 1.5 | NA | - | SW | | Gray (10 YR 5/1) fine to medium well-graded subangular SAND, some Silt, few Clay, aplastic, no odor, saturated, moderately dense. Occasional black (10 YR 2/1) varves. Glacial-alluvial.<br>at 14': Coarsening downwards to fine to coarse subrounded to subangular SAND, few fine to medium rounded Gravel, increased roundness with increased grain-size. | SAND |

**Boring Construction**




BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
woh = Weight of Hammer; - = Negative Test Result.
Sample collected 0.3-2.3' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/12/02 | 5.3' bgs | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-86-15

**Borehole Depth:** 25' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 4 8 16 16 | 24 | 1.7 | NA | - | SW | | Gray (10 YR 5/1) fine to coarse well-graded subangular SAND, some Silt, few Clay, few fine to medium rounded Gravel, aplastic, no odor, saturated, moderately dense. Occasional black (10 YR 2/1) varves. Glacial-alluvial. | SAND | 2" ID Sch. 40 PVC 0.01" slotted screen 10-20' bgs. |
| | | 10 | 18-20 | 6 17 17 50/3" | 34 | 2.0 | NA | - | | | Gray (10 YR 5/1) fine to coarse well-graded subrounded to subangular SAND with fine to coarse rounded to subrounded GRAVEL, few Silt, aplastic, no odor, saturated, loose to moderately dense. Glacial-alluvial. | SAND & GRAVEL | Sand pack 8.3-20' bgs. |
| 20 | 20 | | | | | | | | | | Cobbles and pebbles - augered to 25' bgs. | | |
| | | NA | 20-25 | NA | NA | NA | NA | - | | | | | Natural collapse 20-25' bgs. |
| 25 | 25 | | | | | | | | | | | | |
| 30 | 30 | | | | | | | | | | | | |
| 35 | 35 | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available
woh = Weight of Hammer; - = Negative Test Result.
Sample collected 0.3-2.3' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 1/12/02 | 5.3' bgs | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/16/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2' cont acetate sleeve<br>**Auger Size:** 2 1/4"<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 561145.01<br>**Easting:** 13306640.4<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10' bgs<br>**Surface Elevation:** 723.54<br><br>**Descriptions By:** SC Kerr | **Boring ID:** RFI-94-01<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 725 | | | | | | | | | | |
| 0 | | | | | | | FL | | CONCRETE. | FILL | |
| | | 1 | 0-2 | 1.0 | 9.5 | - | SP | | Yellowish-brown (10YR 5/6) fine SAND, trace Clay, trace medium Sand, aplastic, medium dense, no odor, dry, moist at 3.4' bgs, saturated at 3.8' bgs. | SAND | Borehole backfilled with Bentonite to grade. |
| | 720 | 2 | 2-4 | 1.2 | 13.2 | - | | | | | |
| 5 | | 3 | 4-6 | 1.6 | 14.6 | - | | | | | |
| | | | | | | | ML | | Dark gray (10YR 4/1) SILT, dense, no odor, wet. | | |
| | | 4 | 6-8 | 1.8 | 29.6 | - | SP | | SAND, as at 0.5' - 5.5' bgs, saturated. | SAND | |
| | | | | | | | GW | | Angular to subangular fine GRAVEL, little fine to medium Sand, no odor, saturated. | | |
| | 715 | | | | | | SP | | Very dark brown fine SAND, dense, no odor, saturated. | | |
| 10 | | 5 | 8-10 | 1.6 | 25.2 | - | ML | | Grayish-brown (10YR 5/2) SILT, dense, no odor, wet. | SILT | |
| | 710 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface; - = Negative Test Result
NA = Not Applicable/Not Available
Samples collect from 0.5'-2' and 2'-4' bgs.
1" Temporary Well set at 9' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/16/01 | 3.8' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 08/30/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 3 1/4"<br>**Rig Type:** CME 55 | **Northing:** 561350.54<br>**Easting:** 13306860.52<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** 727.66<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-94-02<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | | | |
| 0 | | 1 | 0-2 | 4 4 4 4 | 8 | 1.7 | 0.0 | - | ML | | Dark brown (10 YR 3/3) SILT, little Clay, little fine to medium subangular to subrounded Sand, earthy odor, moderately loose, aplastic, organic matter such as roots and vegetation present, damp. Topsoil<br>Color change to yellow-brown (10 YR 5/6), no organic matter, moist. | SILT | |
| | 725 | 2 | 2-4 | 2 3 4 6 | 7 | 1.7 | 0.0 | - | CL | | Gray (10 YR 6/1) with heavy oxidation and mottling to yellow-brown (10 YR 5/6) lean CLAY, some Silt, few fine to coarse subangular to subrounded Sand, trace fine to medium subrounded Gravel, no odor, soft, plastic, moist. Local lenses of angular fine to coarse Sand and fine to medium Gravel up to 1" wide throughout first 1.5 feet. Native glacial clay till. | CLAY | |
| 5 | | 3 | 4-6 | 9 9 15 17 | 24 | 2.0 | 0.0 | - | | | | | |
| | | 4 | 6-8 | 7 14 21 36 | 35 | 2.0 | 0.0 | - | | | Increasing stiffness, dry. | | |
| | 720 | 5 | 8-10 | 6 13 19 22 | 32 | 1.6 | 0.0 | - | | | Hard, decreased oxidation now confined to fractures and selvages, otherwise gray (10 YR 5/1). | | |
| 10 | | 6 | 10-12 | 4 13 19 23 | 32 | 1.7 | 0.0 | - | | | No oxidation, homogeneous. | | Borehole tremie grouted. |
| | 715 | 7 | 12-14 | 12 20 24 26 | 44 | 2.0 | 0.0 | - | ML | | Gray (10 YR 5/1) SILT, some Clay, few fine subrounded Sand, trace fine subrounded Gravel, no odor, dense, aplastic, dry. Glacial till. | SILT | |
| 15 | | 8 | 14-16 | 11 33 27 27 | 60 | 1.8 | 0.0 | - | | | Some fine to coarse subangular sand, moist. | | |
| | | | | | | | | | SW | | Gray-brown (10 YR 5/2) fine to coarse subangular well graded SAND, some Silt, little Clay, few fine to coarse | SAND | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
- = Negative Test Result.
Sample collected 0-2', 8-10' and 12-14' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/30/01 | 15.2' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-94-02

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 15 25 50/ 5" | NA | 1.0 | 0.0 | - | SW | | subrounded Gravel, no odor, moderately loose to moderately dense, aplastic, saturated. Glacial-alluvial. Gray-brown (10 YR 5/2) fine to coarse subangular well graded SAND, some Silt, little Clay, few fine to coarse subrounded Gravel, no odor, moderately loose to moderately dense, aplastic, saturated. Glacial-alluvial. | SAND | |
| 710 | | 10 | 18-20 | 39 50/ 5" | NA | 1.0 | 0.0 | - | CL | | Homogeneous gray (10 YR 5/1) SILTY lean CLAY, little fine to coarse subrounded to subangular Sand, few fine to coarse subrounded Gravel, no odor, hard, aplastic, dry. Native glacial clay till. | ← SILTY CLAY → | Borehole tremie grouted. |
| 20 | | | | | | | | | | | | | |
| 705 | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| 700 | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| 695 | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
- = Negative Test Result.
Sample collected 0-2', 8-10' and 12-14' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/30/01 | 15.2' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/8/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:** 2 1/4"<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 561443.72<br>**Easting:** 13306308.88<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 8' bgs<br>**Surface Elevation:** 727.8<br><br>**Descriptions By:** Brian Loomis | **Boring ID:** RFI-94-03<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | |
| 0 | | | | | | | | | | | |
| | | | | | 3.4 | | FL | | CONCRETE. | FILL | |
| | | 1 | 0-2 | 2.0 | 3.6 | NA | | | Very dark brown (10YR 2/2) fine rounded SAND, loose. Fill. | | |
| | | | | | | | | | As above, wet, strong odor. | | Borehole backfilled with Bentonite to grade. |
| | 725 | 2 | 2-4 | 1.4 | 3.2 | NA | | | | | |
| | | | | | | | SP | | As above, saturated, strong odor. | SAND | |
| 5 | | 3 | 4-6 | 2.0 | NA | NA | | | | | |
| | | | | | | | | | As above, saturated, strong odor. | | |
| | | 4 | 6-8 | NA | NA | NA | | | | | |
| | 720 | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| | 715 | | | | | | | | | | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
1" ID 5-ft 0.01" slot screen temporary well set at 8' bgs.
Sample collected 0.8-2' and 2-4' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/8/01 | 4.0' | |

Project: 64410.022 Template: j:\rockware\logplot2001\logfiles\64410\geoprobe.ldf
Data File:RFI-94-03.dat Date: 7/3/01

Par

| | | |
|---|---|---|
| **Date Start/Finish:** 5/23/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Allen Rau<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:**<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 561295.98<br>**Easting:** 13306510.34<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 23' bgs<br>**Surface Elevation:** 727.84<br><br>**Descriptions By:** Brian Loomis | **Boring ID:** RFI-94-04<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | |
| 0 | | | | | | | Fill | | CONCRETE. | | |
| | | 1 | 0-2 | 1.4 | 13.6 | NA | SP | | Layered very dark brown (10YR 2/2) to yellow-brown (10YR 5/6) to black (10YR 2/1) fine to medium subrounded to subangular SAND, locally some subangular to subrounded Gravel. | SAND | Borehole backfilled with Bentonite to grade. |
| | 725 | 2 | 2-4 | 2.0 | 13.5 | NA | | | | | |
| 5 | | 3 | 4-6 | 1.5 | 4.7 | NA | | | | | |
| | | | | | | | CL | | Dark yellowish-brown (10YR 4/4) CLAY, trace fine subangular Sand, very stiff. | | |
| | | 4 | 6-8 | 1.2 | 9.1 | NA | SP | | Reddish fine to medium subangular to angular SAND, trace subrounded Gravel, moist. | SAND & GRAVEL | |
| | 720 | 5 | 8-10 | 2.0 | 5.8 | NA | SP/GF | | 7.0-10.1: Yellowish-brown (10YR 5/4) fine rounded SAND and GRAVEL with Clay, firm.<br>As above with red mottles throughout at 8.0' bgs. | | |
| 10 | | 6 | 10-12 | 2.0 | 5.5 | NA | CL | | Gray (10YR 5/1) CLAY, with fine rounded Sand and Gravel, red mottle, firm.<br>11-14: Gray CLAY, very stiff. | CLAY | |
| | 715 | 7 | 12-14 | 2.0 | 3.1 | NA | | | | | |
| 15 | | 8 | 14-16 | 0.5 | 4.4 | NA | ML | | Gray (10YR 5/1) SILT, trace fine Sand. | SILT | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
1" ID 5-ft 0.01" slot screen temporary well set at 23' bgs.
Samples collected 0.4-2' and 8-10' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/23/01 | 7.0' | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-94-04

**Borehole Depth:** 23' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9 | 16-18 | 2.0 | 2.4 | NA | | | Gray (10YR 5/1) SILT, trace fine Sand. | SILT | Borehole backfilled with Bentonite to grade. |
| | 710 | 10 | 18-20 | 2.0 | 2.0 | NA | ML | | | | |
| 20 | | 11 | 20-22 | NA | 2.0 | NA | | | | | |
| | 705 | | | | | | | | | | |
| 25 | | | | | | | | | | | |
| | 700 | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| | 695 | | | | | | | | | | |
| 35 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available;
1" ID 5-ft 0.01" slot screen temporary well set at 23' bgs.
Samples collected 0.4-2' and 8-10' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/23/01 | 7.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 5/9/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** Direct Push<br>**Sampler Size:** 2 ft cont. acetate sleeve<br>**Auger Size:** 2 1/4" ID<br>**Rig Type:** 66 DT Advance Geoprobe | **Northing:** 561723.65<br>**Easting:** 13306393.62<br>**Casing Elevation:** 727.48<br><br>**Borehole Depth:** 22.5' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** Brian Loomis | **Boring ID:** RFI-94-05<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | |
| 0 | | | | | | | | | | | |
| | | | | | | | Fill | | CONCRETE. | FILL | |
| | | 1 | 0-2 | 1.5 | 4.6 | NA | SP | | Very dark brown fine to medium SAND, trace Clay, dry, loose. | SAND | Borehole backfilled with Bentonite to grade. |
| | 725 | 2 | 2-4 | 2.0 | 4.7 | NA | | | Yellowish-brown fine to medium SAND, some Silt, moist. | | |
| | | | | | | | ML | | Brown SILT, little fine Sand, dry, stiff. | SILT | |
| 5 | | 3 | 4-6 | 2.0 | 3.0 | NA | | | | | |
| | 720 | 4 | 6-8 | 2.0 | 5.2 | NA | | | | | |
| | | 5 | 8-10 | 2.0 | 12.1 | NA | | | | | |
| 10 | | | | | | | | | | | |
| | | 6 | 10-12 | 2.0 | 2.7 | NA | | | Dark gray SILT, trace medium Gravel, dry, dense. | | |
| | | | | | | | CL | | Dark gray CLAY, trace medium to coarse Gravel, dry. | | |
| | 715 | 7 | 12-14 | 2.0 | 3.8 | NA | ML | | Dark gray SILT, trace medium Gravel, dry, dense. | | |
| 15 | | 8 | 14-16 | 0.5 | 5.7 | NA | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0.5-2' 8-10' and 18-20' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/9/01 | 21.0 | |

**Client:**
General Motors

**Site Location:**
GM Flint
Flint, Michigan

**Boring ID:** RFI-94-05

**Borehole Depth:** 22.5' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 710 | 9 | 16-18 | 2.0 | 5.6 | NA | ML | | Dark gray SILT, trace medium Gravel, dry, dense. | SILT | Borehole backfilled with Bentonite to grade. |
| | | 10 | 18-20 | 2.0 | 2.5 | NA | | | Gray SILT, some fine Sand, dry, loose. | | |
| 20 | | | | | | | CL | | Dark gray CLAY, some Silt, little fine Sand, trace Gravel, dry. | SILTY CLAY | |
| | | 11 | 20-22 | 2.0 | 3.7 | NA | SP | | Dark gray fine to medium SAND, some Silt, wet, dense. | | |
| | | | | | | | ML | | Gray SILT, some fine Sand, dry, loose. | | |
| | 705 | NA | 22-22. | NA | NA | NA | SP | | Dark gray fine to medium SAND, some Silt, wet, dense. | | |
| 25 | | | | | | | | | | | |
| | 700 | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| | 695 | | | | | | | | | | |
| 35 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface
NA = Not Applicable/Not Available
Samples collected 0.5-2' 8-10' and 18-20' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 5/9/01 | 21.0 | |

| | | |
|---|---|---|
| **Date Start/Finish:** 05/09/01<br>**Drilling Company:** Mateco<br>**Driller's Name:** Gary Swift<br>**Drilling Method:** 66 DT Advance Geoprobe<br>**Sampler Size:** 2 ft cont. acetate sleeve | **Northing:** 561700.93<br>**Easting:** 13306020.23<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 10' below grade<br>**Surface Elevation:** 732.95<br><br>**Descriptions By:** Shawn Kerr | **Boring ID:** RFI-94-06<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | PID Headspace (ppm) | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| | 735 | | | | | | | | | |
| 0 | | | | | | FL | | 1" ASPHALT and 7" CONCRETE. | FILL | |
| | | 1 | 0-2 | 0.9 | 2.9 | SP | | Very dark brown fine to medium SAND, trace medium to coarse Gravel and Silt, aplastic, wet, no odor. Soil sample taken at 0-2' interval. | SAND | |
| | | | | | | | | Brown fine to medium SAND, little Silt, trace coarse Sand, aplastic, moderately dense, moist, no odor. | | |
| | 730 | 2 | 2-4 | 1.8 | 3.4 | ML | | As above but very loose. | | |
| | | | | | | | | Brown SILT mottled with gray, trace rounded fine to coarse gravel, wet, no odor. | SILT | |
| 5 | | 3 | 4-6 | 2.0 | 1.2 | SP | | SAND, as above at 2.4 to 2.8'. | SAND | Tempoary well set at 10' bgs with sand seal. |
| | | 4 | 6-8 | 2.0 | 3.5 | ML | | SILT as at 2.8-4.0', but brown. Soil sample taken in 8-10' interval. | SILT | |
| | 725 | | | | | | | | | |
| | | 5 | 8-10 | 2.0 | 6.2 | SP | | Brown medium to coarse angular SAND, some subangular to subrounded Gravel, no odor, wet. | SAND | |
| 10 | | | | | | OL | | Brown SILTY CLAY, little Gravel, trace medium to coarse Sand, dry, no odor. | | |
| | 720 | | | | | | | | | |
| 15 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface; - = Negative Test Result
NA = Not Applicable/Not Available;
1" ID 5-ft 0.01" slot screen temporary well set at 10' bgs.
Samples collected 0.8-2' and 8-10' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **Date Start/Finish:** 08/17/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-EP-94-02A<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | | | Asphalt | FILL | |
| | | 1 | 0-2 | NA<br>3<br>2<br>4 | 5 | 1.0 | 3.9 | - | SP | | Brown (10 YR 4/3) fine to coarse subangular SAND, some to little Silt, few fine subrounded to subangular Gravel, few Clay, aplastic, no odor, moderately dense to moderately loose, moist. | SAND | |
| | | 2 | 2-4 | 4<br>7<br>7<br>9 | 14 | 1.2 | 4.5 | - | ML | | Yellow-brown (10 YR 5/6), SILT, some Clay, no odor, dense, moist, aplastic. | SILT | |
| 5 | 5 | 3 | 4-6 | 9<br>13<br>17<br>19 | 30 | 2.0 | 3.6 | - | CL | | Yellow-brown (10 YR 5/4), Silty CLAY, little fine to coarse subangular to subrounded Sand, few fine to medium rounded to subrounded Gravel, no odor, dry, hard.<br><br>at 4': Becomes gray (10 YR 5/1) with yellow-brown (10 YR 5/4) mottling and oxidation along fractures and selvages, dry. | SILTY CLAY | |
| | | 4 | 6-8 | 5<br>9<br>10<br>20 | 19 | 1.5 | 3.9 | - | | | Becomes homogeneous gray (10YR 5/1), no oxidation. | | Borehole tremie grouted. |
| | | | | | | | | | SM | | Gray (10 YR 5/1) Silty fine to coarse subrounded to subangular SAND, few Clay, no odor, dense, moist to wet, aplastic. Glacial-alluvial. | | |
| | | 5 | 8-10 | 7<br>8<br>10<br>12 | 18 | 2.0 | 8.6 | - | | | Homogenous gray (10 YR 5/1) Silty CLAY, as at 6-7.7' bgs, very stiff, occasional Silty sand seams as at 7.7-8.3' bgs throughout, up to 1" thick. Till. | | |
| 10 | 10 | 6 | 10-12 | 3<br>7<br>11<br>19 | 18 | 1.7 | 3.9 | - | | | | | |
| | | 7 | 12-14 | 3<br>7<br>10<br>16 | 17 | 1.4 | 2.8 | - | CL | | 1" wide Silty Sand seam, saturated.<br><br>2" wide Silty Sand seam, saturated. | | |
| 15 | 15 | 8 | 14-16 | 7<br>14<br>20<br>18 | 34 | NA | 1.7 | - | | | Becomes hard, no more silty sand seams. | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
- = Negative Test Result.
Samples collected 2.5-4.5' and 4.5-6.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/17/01 | 12.0' | |

Project: 644.10.022 Template: j:\rockware\logplot2001\logfiles\64410\Auger_well.ldf
Data File:RFI-EP-94-02A Date: 09/15/01

| | | |
|---|---|---|
| **Date Start/Finish:** 08/17/01<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Greg Compeau<br>**Drilling Method:** HSA/SS<br>**Sampler Size:** 2'x2" ID<br>**Auger Size:** 2 1/4"<br>**Rig Type:** CME 55 | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** NA<br><br>**Descriptions By:** SM Duly | **Boring ID:** RFI-EP-94-02B<br><br>**Client:** General Motors<br><br>**Location:** GM Flint<br>Flint, Michigan |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Blows / 6 Inches | N - Value | Recovery (feet) | PID Headspace (ppm) | Oil/Water Shake Test | USCS Code | Geologic Column | Stratigraphic Description | Hydrostratigraphy | Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | | | | | | | | |
| | | 1 | 0-2 | NA<br>5<br>6<br>5 | 11 | 1.2 | 0.0 | - | FILL | | Asphalt | FILL | |
| | | | | | | | | | SM | | Yellow-brown (10YR 5/6) Silty fine to coarse subangular to subrounded SAND, few Clay, no odor, damp, moderately dense. | SILTY SAND | |
| | | 2 | 2-4 | 5<br>9<br>13<br>19 | 22 | 1.7 | 0.0 | - | CL | | Yellow-brown (10YR 5/4) Silty CLAY, few fine to medium subangular to subrounded Sand, trace coarse rounded Gravel, no odor, dry, very stiff. Becomes gray (10YR 5/1) with yellow-brown (10YR 5/4) oxidation confined to selvages and fractures after 3.2' bgs. Hard at 4' bgs. | SILTY CLAY | |
| 5 | 5 | 3 | 4-6 | 7<br>14<br>16<br>20 | 30 | 1.8 | 0.0 | - | | | | | |
| | | 4 | 6-8 | 6<br>9<br>11<br>13 | 20 | 2.0 | 0.0 | - | SM<br>CL | | Gray (10YR 5/1), Silty fine to medium subrounded to subangular SAND, few Clay, aplastic, no odor, moderately loose, moist.<br>Homogeneous gray (10YR 5/1) Silty CLAY, no oxidation, few fine to medium rounded Gravel. | SILTY CLAY | Borehole tremie grouted. |
| | | 5 | 8-10 | 4<br>9<br>15<br>16 | 24 | 1.7 | 0.0 | - | | | Occasional Silty Sand seams as at 6.0' bgs, up to 1" thick throughout. | | |
| 10 | 10 | 6 | 10-12 | 4<br>10<br>15<br>20 | 25 | 1.7 | 0.0 | - | | | | | |
| | | 7 | 12-14 | 7<br>11<br>21<br>23 | 32 | 1.8 | 2.1 | - | | | Silty Sand seam/lens, saturated. | | |
| 15 | 15 | 8 | 14-16 | 4<br>10<br>16<br>23 | 26 | 2.0 | 0.0 | - | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** bgs = below ground surface;
NA = Not Applicable/Not Available.
- = Negative Test Result.
Samples collected 0.5-2.5' and 2.5-4.5' bgs.

**Water Level Data**

| Date | Depth | Elev. |
|---|---|---|
| 08/17/01 | 12.0' | |

| | | |
|---|---|---|
| **Date Start/Finish:** 10/27/00 -10/27/00<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Chapbron/Ryan<br>**Drilling Method:** HSA/SS<br>**Bit Size:** NA<br>**Auger Size:** 3.75" ID<br>**Rig Type:** CME 45 B Truck Mounted Dill Rig<br>**Sampling Method:** 2' x 2" ID | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 18' bgs<br>**Surface Elevation:** 729.7'<br><br>**Geologist:** Raymond Wagner | **Well/Boring ID:** WL-B1<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Phase II ESA<br>Former Waste Lagoon Site |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N-Values | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | |
| 0 | | 1 | 0-2 | 1.8 | 3, 9, 16, 19 | 25 | 0.0 | | | Brown to black SILT, some fine to medium Sand and Cinders [FILL], moist to firm. | |
| | | 2 | 2-4 | 0.2 | 7, 4, 9, 12 | 13 | 0.0 | | | As above, [FILL], moist. | |
| 5 | 725 | 3 | 4-6 | 0.2 | 7, 13, 16, 13 | 29 | 4.0 | | | Brown SILT, little medium to coarse Sand and fine Gravel, trace Clay, moist to compact. | Borehole backfilled with Bentonite to grade |
| | | 4 | 6-8 | 2.0 | 19, 16, 18, 24 | 34 | 6.3 | | | As above, dry, compact. | |
| 10 | 720 | 5 | 8-10 | 2.0 | 10, 15, 16, 13 | 31 | 7.6 | ✸ | | Brown-gray mottled SILT, little medium to coarse Sand, trace fine Gravel, dry, compact. | |
| | | 7 | 10-12 | 2.0 | 3, 7, 14, 17 | 21 | 2.1 | | | Gray SILT, little medium to coarse Sand and fine Gravel, embedded, dry, firm. | |
| | | 8 | 12-14 | 2.0 | 6, 16, 17, 23 | 33 | 0.0 | | | As above, dry, compact [TILL]. | |
| 15 | 715 | 9 | 14-16 | 2.0 | 15, 25, 18, 19 | 43 | 0.0 | | | As above, dry, compact [TILL]. | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** No temporary well installed, no water encountered.
Borehole terminated at 18'.
Sample collected 8-10' bgs.

**Client:**
General Motors

**Site Location:**
GM-Flint - Phase II ESA
Former Waste Lagoon Site

**Well/Boring ID:** WL-B1

**Borehole Depth:** 18' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N - Value | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 16-18 | 2.0 | 3<br>9<br>19<br>30 | 28 | 0.0 | | | As above, dry, compact [TILL]. | Borehole backfilled with Bentonite to grade |
| 20 | 710 | | | | | | | | | | |
| 25 | 705 | | | | | | | | | | |
| 30 | 700 | | | | | | | | | | |
| 35 | 695 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** No temporary well installed, no water encountered.
Borehole terminated at 18'.
Sample collected 8-10' bgs.

| | | |
|---|---|---|
| **Date Start/Finish:** 10/27/00 -10/27/00<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Chapbron/Ryan<br>**Drilling Method:** HSA/SS<br>**Bit Size:** NA<br>**Auger Size:** 3.75" ID<br>**Rig Type:** CME 45 B Truck Mounted Dill Rig<br>**Sampling Method:** 2' x 2" ID | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 727.7'<br><br>**Geologist:** Raymond Wagner | **Well/Boring ID:** WL-B2<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Phase II ESA<br>Former Waste Lagoon Site |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N-Values | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | |
| 0 | | 1 | 0-2 | 0.9 | 5 5 9 7 | 14 | 0.0 | | | Brown SILT, some medium to coarse Sand, little fine Gravel and fine Sand, moist, firm. | |
| | 725 | 2 | 2-4 | 1.4 | 9 11 10 7 | 21 | 4.2 | ✸ | | Dark brown SILT, some fine to coarse Sand, little Cinders and Brick fragments [FILL]. | |
| 5 | | 3 | 4-6 | 1.8 | 2 5 6 9 | 11 | 0.0 | | | Brown SILT, some fine to medium Sand, little coarse Sand and fine Gravel, moist to wet, firm. | Borehole backfilled with Bentonite chips. |
| | 720 | 4 | 6-8 | 2.0 | 9 11 32 40 | 43 | 0.0 | | | Brown mottled SILT, little fine to coarse Sand and fine Gravel, trace Clay, moist, compact. | |
| 10 | | 5 | 8-10 | 1.8 | 22 56 50/0 - | 106 | 0.5 | | | As above, moist, very compact. [TILL] | |
| | | 7 | 10-12 | 2.0 | 13 17 24 27 | 41 | 0.0 | | | Gray mottled SILT, little medium to coarse Sand and fine Gravel embedded, dry, compact [TILL]. | |
| | 715 | 8 | 12-14 | 2.0 | 11 22 23 24 | 45 | 0.0 | | | Gray SILT, little medium to coarse Sand and fine to coarse Gravel embedded, dry, compact [TILL]. | |
| 15 | | 9 | 14-16 | | 9 16 18 19 | 34 | 0.0 | | | As above, dry, compact. [TILL] | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** No temporary well installed, no water encountered.
Sample WL-B2 (2-4) submitted for VOC & Metals (Mich. 10) analysis. Borehole terminated at 16'.

| | | |
|---|---|---|
| **Date Start/Finish:** 10/30/00 -10/30/00<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Chapbron/Ryan<br>**Drilling Method:** HSA/SS<br>**Bit Size:** NA<br>**Auger Size:** 3.75" ID<br>**Rig Type:** CME 45 B Truck Mounted Dill Rig<br>**Sampling Method:** 2' x 2" ID | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** 729.5'<br><br>**Geologist:** Raymond Wagner | **Well/Boring ID:** WL-B3<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Phase II ESA<br>Former Waste Lagoon Site |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N-Values | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | |
| 0 | | 1 | 0-2 | 0.9 | 7 17 8 7 | 25 | 0.0 | | | Brown SILT, some Concrete and Brick fragments, little medium to coarse Sand, dry, compact. |
| | | 2 | 2-4 | NA | - - - - | NA | NA | | | CONCRETE, No Sample taken. |
| | 725 | 3 | 4-6 | 0.2 | 50/0. | NA | 0.0 | | | Brown SILT, Concrete and Brick debris [FILL]. |
| 5 | | 4 | 6-8 | 0.6 | 33 50/0. | NA | 0.0 | | | CONCRETE fragments, little Silt, and medium to coarse Sand [FILL]. |
| | 720 | 5 | 8-10 | 0.5 | 50/0. | NA | 0.0 | | | Brown SILT, little medium to coarse Sand and fine Gravel embedded, dry. |
| 10 | | 7 | 10-12 | 1.2 | 7 19 26 25 | 45 | 0.0 | ✸ | | Gray SILT, little medium to coarse Sand and fine to coarse Gravel embedded, dry, very compact. |
| | | 8 | 12-14 | 2.0 | 22 34 37 40 | 71 | 0.0 | | | As above, dry, very compact [TILL]. |
| | 715 | 9 | 14-16 | 2.0 | 16 26 28 25 | 54 | 0.0 | | | As above, dry, very compact [TILL]. |
| 15 | | | | | | | | | | |

Well/Boring Construction

Borehole backfilled with Bentonite to grade.

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** No temporary well installed, no water encountered.
Sample WL-B3 (10-12') submitted for VOC & Metals (Mich. 10) analysis.

**Client:**
General Motors

**Site Location:**
GM-Flint - Phase II ESA
Former Waste Lagoon Site

**Well/Boring ID:** WL-B3

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N - Value | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 16-18 | 1.8 | 9, 13, 22, 25 | 35 | 0.0 | | | As above, dry, compact. [TILL] | Borehole backfilled with Bentonite to grade. |
| | | 11 | 18-20 | 1.8 | 4, 13, 21, 25 | 33 | 0.0 | | | As above, dry, compact. [TILL] | |
| 20 | 710 | | | | | | | | | | |
| 25 | 705 | | | | | | | | | | |
| 30 | 700 | | | | | | | | | | |
| 35 | 695 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** No temporary well installed, no water encountered.
Sample WL-B3 (10-12') submitted for VOC & Metals (Mich. 10) analysis.

| | | |
|---|---|---|
| **Date Start/Finish:** 10/30/00 -10/30/00<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Chapbron/Ryan<br>**Drilling Method:** HSA/SS<br>**Bit Size:** NA<br>**Auger Size:** 3.75" ID<br>**Rig Type:** CME 45 B Truck Mounted Dill Rig<br>**Sampling Method:** 2' x 2" ID | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 20' bgs<br>**Surface Elevation:** 729.5'<br><br>**Geologist:** Raymond Wagner | **Well/Boring ID:** WL-B3<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Phase II ESA<br>Former Waste Lagoon Site |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N-Values | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 730 | | | | | | | | | | |
| 0 | | 1 | 0-2 | 0.9 | 7 17 8 7 | 25 | 0.0 | | | Brown SILT, some Concrete and Brick fragments, little medium to coarse Sand, dry, compact. | |
| | | 2 | 2-4 | NA | - - - - | NA | NA | | | CONCRETE, No Sample taken. | |
| | 725 | 3 | 4-6 | 0.2 | 50/0. | NA | 0.0 | | | Brown SILT, Concrete and Brick debris [FILL]. | Borehole backfilled with Bentonite to grade. |
| 5 | | 4 | 6-8 | 0.6 | 33 50/0. | NA | 0.0 | | | CONCRETE fragments, little Silt, and medium to coarse Sand [FILL]. | |
| | 720 | 5 | 8-10 | 0.5 | 50/0. | NA | 0.0 | | | Brown SILT, little medium to coarse Sand and fine Gravel embedded, dry. | |
| 10 | | 7 | 10-12 | 1.2 | 7 19 26 25 | 45 | 0.0 | ✱ | | Gray SILT, little medium to coarse Sand and fine to coarse Gravel embedded, dry, very compact. | |
| | | 8 | 12-14 | 2.0 | 22 34 37 40 | 71 | 0.0 | | | As above, dry, very compact [TILL]. | |
| | 715 | 9 | 14-16 | 2.0 | 16 26 28 25 | 54 | 0.0 | | | As above, dry, very compact [TILL]. | |
| 15 | | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** No temporary well installed, no water encountered.
Sample WL-B3 (10-12') submitted for VOC & Metals (Mich. 10) analysis.

**Client:**
General Motors

**Site Location:**
GM-Flint - Phase II ESA
Former Waste Lagoon Site

**Well/Boring ID:** WL-B3

**Borehole Depth:** 20' bgs

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N - Value | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 16-18 | 1.8 | 9 13 22 25 | 35 | 0.0 | | | As above, dry, compact. [TILL] | Borehole backfilled with Bentonite to grade. |
| | | 11 | 18-20 | 1.8 | 4 13 21 25 | 33 | 0.0 | | | As above, dry, compact. [TILL] | |
| 20 | 710 | | | | | | | | | | |
| 25 | 705 | | | | | | | | | | |
| 30 | 700 | | | | | | | | | | |
| 35 | 695 | | | | | | | | | | |

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

**Remarks:** No temporary well installed, no water encountered.
Sample WL-B3 (10-12') submitted for VOC & Metals (Mich. 10) analysis.

| | | |
|---|---|---|
| **Date Start/Finish:** 10/30/00 -10/30/00<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Chapbron/Ryan<br>**Drilling Method:** HSA/SS<br>**Bit Size:** NA<br>**Auger Size:** 3.75" ID<br>**Rig Type:** CME 45 B Truck Mounted Dill Rig<br>**Sampling Method:** 2' x 2" ID | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 724.9'<br><br>**Geologist:** Raymond Wagner | **Well/Boring ID:** WL-B4<br>WL-TW1<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Phase II ESA<br>Former Waste Lagoon Site |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N-Values | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 725 | 1 | 0-2 | 0.9 | 2 3 5 5 | 8 | 0.0 | | | Dark brown SILT, some fine to medium Sand, little coarse Sand and fine Gravel, moist, loose. | |
| | | 2 | 2-4 | 1.3 | 3 3 7 13 | 10 | 0.0 | ✱ | | Brown SILT, some medium to coarse Sand, little fine Gravel, moist, firm. | |
| 5 | 720 | 3 | 4-6 | 1.7 | 11 17 35 37 | 52 | 0.0 | | | Brown mottled SILT, little medium to coarse Sand and fine Gravel embedded, dry, very compact. | Borehole backfilled with Bentonite chips. |
| | | 4 | 6-8 | 2.0 | 16 32 38 39 | 70 | 0.0 | | | As above, dry, very compact [TILL]. | |
| | | 5 | 8-10 | 2.0 | 10 15 15 16 | 30 | 0.0 | | | Gray SILT, little medium to coarse Sand and fine Gravel, trace fine Sand and Clay, dry, compact [TILL]. | |
| 10 | 715 | 7 | 10-12 | 1.6 | 4 9 13 16 | 22 | 0.0 | | | As above, firm, moist. [TILL] | |
| | | 8 | 12-14 | 1.7 | 5 10 16 22 | 26 | 0.0 | | | As above, firm, moist. [TILL] | |
| 15 | 710 | 9 | 14-16 | 1.6 | 4 10 17 21 | 27 | 0.0 | | | As above, dry, firm [TILL]. | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Sample WL-B4 (2-4') submitted for VOC & Metals (Mich. 10) analysis. Borehole terminated at 16'. Temporary 2" diameter PVC well with 10 slot, 5' screen was set in soil boring. WL-TW1 sampled for VOCs, SVOCs, Metals, & PCBs.

| | | |
|---|---|---|
| **Date Start/Finish:** 10/30/00 -10/30/00<br>**Drilling Company:** RAU Drilling<br>**Driller's Name:** Rod Chapbron/Ryan<br>**Drilling Method:** Hollow Stem Auger<br>**Bit Size:** NA<br>**Auger Size:** 3.75" ID<br>**Rig Type:** CME 45 B Truck Mounted Dill Rig<br>**Sampling Method:** 2" Split-Spoon | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 723.1'<br><br>**Geologist:** Raymond Wagner | **Well/Boring ID:** WL-B5<br>WL-TW2<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Phase II ESA<br>Former Waste Lagoon Site |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N-Values | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 725 | | | | | | | | | | |
| 0 | | 1 | 0-2 | 2.0 | 2 4 5 6 | 9 | 0.0 | | | <Topsoil 6"> Brown SILT, some medium to coarse Sand and fine to coarse Gravel, moist, loose. | |
| | 720 | 2 | 2-4 | 0.2 | 3 4 4 4 | 8 | 0.0 | | | As above. | |
| 5 | | 3 | 4-6 | 2.0 | 5 10 11 8 | 21 | 0.0 | | | Brown fine SAND and SILT, moist to wet, firm. | Borehole backfilled with Bentonite to grade. |
| | | 4 | 6-8 | 2.0 | 7 14 17 18 | 31 | 0.0 | | | Gray-brown mottled SILT, some fine to coarse Sand, little fine to coarse Gravel, moist, compact. | |
| | 715 | 5 | 8-10 | 1.9 | 6 11 14 16 | 25 | 0.0 | | | Gray SILT, little medium to coarse Sand and fine to coarse Gravel embedded, trace Clay [TILL], moist, compact. | |
| 10 | | 7 | 10-12 | 1.9 | 5 7 19 25 | 26 | 0.0 | ✱ | | Gray SILT and fine SAND, little medium to coarse Sand and fine Gravel, wet, firm. | |
| | 710 | 8 | 12-14 | 1.7 | 8 12 16 21 | 28 | 0.0 | | | Gray SILT, little fine to coarse Sand and fine Gravel, moist, compact. | |
| 15 | | 9 | 14-16 | 2.0 | 15 24 27 33 | 51 | 0.0 | | | As above, moist, very compact [TILL]. | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Sample WL-B5 (10-12') submitted for VOC, SVOC, & Metals (Mich. 10) analysis. Borehole terminated at 16'. Temporary 2" diameter PVC well with 10 slot, 5' screen was set in soil boring and sampled for VOCs, Metals (Mich. 10), & PCBs.

| | | |
|---|---|---|
| **Date Start/Finish:** 10/31/00-10/31/00<br>**Drilling Company:** Rau Drilling<br>**Driller's Name:** Rod Chapbron/Ryan<br>**Drilling Method:** HSA/SS<br>**Bit Size:** NA<br>**Auger Size:** 3.75" ID<br>**Rig Type:** CME 45 B Truck Mounted Dill Rig<br>**Sampling Method:** 2' x 2" ID | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 16' bgs<br>**Surface Elevation:** 722.4'<br><br>**Geologist:** Raymond Wagner | **Well/Boring ID:** WL-B6<br>WL-TW3<br><br>**Client:** General Motors<br>**Location:** GM-Flint - Phase II ESA<br>Former Waste Lagoon Site |

| DEPTH | ELEVATION | Sample Run Number | Sample/Int/Type | Recovery (feet) | Blows / 6 Inches | N-Values | PID Headspace (ppm) | Analytical Sample | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 725 | | | | | | | | | | |
| 0 | | 1 | 0-2 | 0.5 | 4 12 16 20 | 28 | 5.8 | | | <Topsoil 6"> Dark brown SILT, little medium to coarse Sand and fine Gravel. | |
| | 720 | 2 | 2-4 | 1.5 | 7 14 16 21 | 30 | 7.6 | | | Brown SILT and fine SAND, little medium to coarse Sand and fine Gravel, moist, firm. | |
| 5 | | 3 | 4-6 | 1.3 | 4 3 6 12 | 9 | 12 | | | As above, with some Clay, wet, loose. | Borehole backfilled with Bentonite to grade. |
| | 715 | 4 | 6-8 | 1.7 | 5 12 18 10 | 30 | 11.1 | | | Brown-gray mottled SILT, little medium to coarse Sand and fine to coarse Gravel, trace Clay, moist . | |
| 10 | | 5 | 8-10 | 1.6 | 7 12 14 20 | 26 | 18.6 | | | Gray SILT, little medium to coarse Sand and fine to coarse Gravel embedded, dry, firm [TILL]. | |
| | | 7 | 10-12 | 1.5 | 8 17 23 29 | 40 | 29.5 | ✱ | | As above, with fine Sand seam @ 10.7'-11.2', wet, compact. | |
| | 710 | 8 | 12-14 | 1.6 | 9 14 20 28 | 34 | 24.3 | | | Gray SILT, little fine to coarse Sand and fine Gravel, moist to wet, compact. | |
| 15 | | 9 | 14-16 | 1.8 | 10 15 21 29 | 36 | 27.1 | | | As above, moist to wet, compact [TILL]. | |

BBL
BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

**Remarks:** Sample WL-B6 (10-12') submitted for VOC, SVOC, & Metals (Mich. 10) analysis. Borehole terminated at 16'. Temporary 2" diameter PVC well with 10 slot, 5' screen was set in soil boring. Samples WL-TW3 and DUP-2 sampled for VOCs, SVOCs, Metals (Mich. 10), and PCBs.