Resource Conservation and Recovery Act Facility Investigation Phase I Report

Volume I of IV

General Motors Corporation
NAO Flint Operations Site
Flint, Michigan

June 28, 2002

REPORT

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BLASLAND, BOUCK & LEE, INC.
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Acronyms

AOI	area of interest
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
ATEC	American Testing and Engineering Corporation Associates
BBL	Blasland, Bouck, & Lee, Inc.
BEHP	bis(2-ethylhexyl)phthalate
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylene
cfs	cubic feet per second
cm/sec	centimeter(s) per second
cy	cubic yard(s)
DOCC	Description of Current Conditions
DNAPL	dense non-aqueous phase liquid
EI	Environmental Indicator
FE	Flammability and Explosivity Criteria
FOIA	Freedom of Information Act
FSP	Field Sampling Plan
G&M	Geraghty & Miller
GAI	Groundwater Acute Inhalation Criteria
GCC	Groundwater Contact Criteria
GIS	geographic information system
GM	General Motors Corporation
gpm	gallons per minute
GM	General Motors Corporation
GSI	Groundwater/Surface Water Interface Criteria
HASP	Health and Safety Plan
IDC	Industrial Direct Contact Criteria
IDW	Industrial Drinking Water Criteria
IGVIA	Industrial Groundwater Volatilization to Indoor Air Inhalation Criteria
IM	interim measure
IPSIC	Industrial Particulate Soil Inhalation Criteria
ISVIA	Industrial Soil Volatilization to Indoor Air Inhalation Criteria
IVSIC	Industrial Infinite Source Volatile Soil Inhalation Criteria
LNAPL	light non-aqueous phase liquid
MDEQ	Michigan Department of Environmental Quality
mg/Kg	milligrams/kilogram
NAO	North American Operations
NPDES	National Pollutant Discharge Elimination System
NREPA	Natural Resources and Environmental Protection Act (1994 PA 451, as amended)
NTU	nepholometric turbidity unit
PAL	Project Analyte List
PID	photoionization detector
ppm	parts per million
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act

RDW	Residential Drinking Water Criteria
RFI	RCRA Facility Investigation
SDG	sample delivery group
SVOC	semi-volatile organic compound
TAL	Target Analyte List
TCL	Target Compound List
ug/L	micrograms per liter
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

1. Introduction

1.1 General

This *Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Phase I Report* (RFI Phase I Report) presents a summary of RFI activities completed through March 9, 2002 at the General Motors Corporation (GM) North American Operations (NAO) Flint Operations Site in Flint, Michigan (the Site). This report fulfills (in part) tasks outlined under Condition VI.1.b of the RCRA Section 3008(h) Administrative Order of Consent (Consent Order) R8H-5-00-02, effective March 2, 2000 (modified November 8, 2001) for the Site (ID #MID 005 356 712). Additional RFI activities, including further soil and groundwater monitoring and completion of Environmental Indicators, will be performed in 2002 and 2003. A Phase II RFI Report will be submitted in March 2004, in accordance with the Consent Order, to present the results of the additional RFI activities.

Ongoing RFI activities are being conducted in accordance with the *RCRA Facility Investigation Work Plan* (RFI Work Plan) prepared by Blasland, Bouck & Lee, Inc. (BBL) and submitted by GM to the U.S. Environmental Protection Agency (USEPA) on March 30, 2001. A conference call was held between GM and USEPA on April 5, 2001 to discuss USEPA comments concerning the RFI Work Plan. The final RFI Work Plan, with clarifications based on the April 5, 2001 discussion with USEPA, was submitted to the USEPA on May 30, 2001. Supplemental activities, prompted by encountered field conditions, have been discussed during biweekly conference calls and quarterly coordination meetings between GM and USEPA. Summaries of each of these discussions are presented in minutes, memoranda, and quarterly progress reports submitted to the USEPA and copied to the Michigan Department of Environmental Quality (MDEQ). These documents were also placed in the Flint Public Library for public viewing.

This RFI Phase I Report presents a summary of the procedures, methods, and results of the field investigations conducted between October 26, 2000 and March 9, 2002. The information includes a comparison of the RFI analytical data with generic MDEQ risk-based screening criteria to identify whether a potential release of hazardous waste or hazardous constituents has occurred from each Area of Interest (AOI) identified for further investigation in the RFI Work Plan and to delineate any such releases, as appropriate.

For those AOIs where screening criteria have not been exceeded for either soils or groundwater, no further investigation has been proposed. At some AOIs, screening criteria have been exceeded, but the extent of the exceedances has been defined. In these circumstances, no further investigations will be performed for that particular AOI, but the area will be retained for risk evaluation.

Where there are exceedances of screening criteria and the extent of exceedances has not been defined at an AOI, additional investigation activities will be performed in the subsequent phase of the RFI.

In instances where a potential release is identified above MDEQ screening criteria, the nature and extent of hazardous constituents are discussed. The data presented in this RFI Phase I Report and data collected during ongoing RFI activities will be used to complete a risk evaluation. The risk evaluation will evaluate whether the presence of constituents above the generic MDEQ screening criteria poses an unacceptable risk to human health or the environment warranting corrective measures. The risk evaluation will be submitted to the USEPA by March 2004, in accordance with the Consent Order.

1.2 RFI Objectives

The objective of the RFI is to collect data of sufficient quality and quantity to support an assessment of potential current and future risks to human health and the environment associated with releases of hazardous waste and/or hazardous constituents. To meet this overall objective, the RFI will:

- Determine whether a release of hazardous waste/constituents to soil or groundwater has occurred at AOIs identified in the DOCC Report as requiring investigation;
- Characterize the source(s) of a release and determine the nature and extent of constituents in environmental media to the extent necessary to protect human health and the environment;
- Characterize actual and potential migration pathways, actual and potential human and environmental receptors, and current and reasonably expected future land and groundwater uses;
- Assess potential risk to human health and the environment associated with any significant releases of hazardous waste/constituents;
- Determine whether interim corrective measures are necessary to control current unacceptable human exposures or to control migration of contaminated groundwater;
- Provide sufficient data to support a demonstration that current human exposures to contamination above risk-based levels are under control and that the migration of groundwater contaminated above acceptable levels is stabilized; and
- Determine if final corrective measures are necessary to mitigate all current and future unacceptable risks, if any, to human health and the environment.

1.3 Report Organization

This RFI Phase I Report is organized as follows:

- Section 1 (Introduction) presents the RFI Phase I Report's purpose and organization, as well as the RFI objectives.
- Section 2 (RFI Overview) presents a summary of general conditions at the Site, including a Site description, a summary of the AOIs and other areas investigated during this portion of the RFI, and an evaluation of potential interim measures (IMs) identified during this portion of the RFI.
- Section 3 (Environmental Setting) summarizes the environmental setting of the Site, including information on regional land use and demographics, climate, geology, hydrogeology, and hydrology.
- Section 4 (Investigation Results and Discussion) presents a summary and discussion of the RFI results for each of the AOIs investigated, including areas where IMs may be proposed. The discussion for each investigated AOI includes a summary of the scope of the field investigations, a summary and screening of

the RFI data, and a discussion of whether the nature and extent of hazardous constituents has been determined.

- Section 5 (Project Status Report) summarizes the current RFI status of each AOI at the Site, identifying AOIs where no significant releases were found, AOIs where releases will be subject to risk evaluation , and AOIs for which an IM is proposed. In addition, this section identifies AOIs that require additional investigation to assess the extent of screening criteria exceedances.

- Section 6 presents a list of references used in the preparation of this report.

- Tables and figures cited in the text of the report are found at the end of the text.

- Appendix A presents soil boring and monitoring well logs from this investigation.

- Appendix B presents the geotechnical data collected during the RFI.

- Appendix C presents RFI soil analytical data.

- Appendix D presents RFI groundwater analytical data.

- Appendix E presents RFI LNAPL analytical data.

- Appendix F includes an evaluation of total and dissolved TAL data for groundwater.

- Appendix G contains summaries of the results of data review and data validation. The complete data deliverables provided by the laboratory that performed the analysis of RFI samples are stored in BBL's project files and are available upon request.

2. RFI Overview

This section provides an overview of the RFI with respect to Site description and history, pre-RFI investigations, previous and current RFI investigations, and IMs.

2.1 Site Description and History

The Site is located at 902 East Hamilton Avenue in Flint, Michigan, in Genesee County (see Figures 2-1, 2-3, and 2-4) and encompasses approximately 452 acres of land. It is generally bounded to the north by Stewart Avenue and Pierson Road, to the south by Harriet Street, to the east by James P. Cole Boulevard and CSX Railroad, and to the west by Industrial Avenue and North Street. Current operations are all conducted in the portion of the property located north of Leith Street that is referred to as the Northend. Building demolition activities are in progress in the portion of the property located south of Leith Street that is referred to as the Southend.

A plastics recycling facility is located on the northeast corner of James P. Cole Boulevard and Garfield Avenue, and a Consumers Power Building is located on the southeast corner of James P. Cole Boulevard, between the Site and the Flint River. An idle DuPont facility is located south of Hamilton Avenue, east of the Site. The CSX Railroad and Interstate I-475 are located to the east, between the Site and the Flint River, as well as several other companies, including Bell's Produce, PPG Industries, Kasle Steel/Auto Blankers, Flint Coatings, and Lockhart Chemicals. Flint Plating occupies a corner just north of the Site's industrial wastewater treatment plant. The remaining areas surrounding the Site are generally occupied by residential neighborhoods and other companies including Unit Terminal (GM-owned), Universal Systems, and Associated Truck.

Portions of the Site were originally developed in the late 1800s to produce the "horseless carriage." In 1898, Billy Durant and J. Dallas Dort purchased the Imperial Wheel Company, making it a subsidiary of the Durant/Dort Carriage Company. After Durant/Dort Carriage Company purchased the Imperial Wheel Company, manufacturing operations were relocated to the intersection of Hamilton Avenue and St. John Street (currently James P. Cole Boulevard). The Buick Motor Company was first established in Flint when Flint Wagon Works purchased the company from David Buick in September 1903. In 1903, the Buick Motor Company was relocated from Detroit to the Site, on Hamilton Avenue between Industrial Avenue and St. John Street (now James P. Cole Boulevard).

In addition to the manufacturing of automobiles, in response to World War I, the Buick Motor Company began producing the Liberty Aircraft engine in 1918. Similarly, in response to World War II, the production of automobiles was stopped in 1942, and the Buick complex was converted for the production of military equipment. Current Site operations include machining of ferrous and nonferrous metals, V-6 engine manufacturing, torque converter manufacturing, transmission components manufacturing, engine assembly, and industrial wastewater treatment.

2.2 Pre-RFI Investigations

Numerous historical investigations were performed at the Site over the years on behalf of GM by various environmental consultants. Several of these investigations involved the assessment of potential soil and/or groundwater contamination either within various regions of the Site or along its perimeter (i.e., focusing on relatively large areas of the Site), while the remaining investigations involved more focused assessments of

specific areas (e.g., underground storage tank [UST] areas, process areas) where constituents of interest were identified as being potentially released to the environment (e.g., UST releases). The perimeter and/or regional Site investigations included the following:

- Storm Sewer Outfall 003 Investigation (American Testing and Engineering Corporation Associates [ATEC], October, 1992, May 1993, June 1993);
- Site Investigation (Pierson Road to Leith Street) (ATEC, September 1993, April 1994);
- Fenceline Investigation (EnecoTech Midwest, Inc. [EnecoTech], March 1996); and
- Semiannual Groundwater Investigations (BBL, 1997 through 1999).

Additional investigations of specific Site areas focused on various factories comprising the Site (e.g., Factories 03, 05, 07, 36, 81, etc.) and specific areas associated with USTs.

These investigations are further discussed in *Description of Current Conditions for Areas South of Leith Street* (Southend DOCC) (BBL, 2000a) and *Description of Current Conditions for Areas North of Leith Street* (Northend DOCC) (BBL, 2000b).

Based on the historical investigations performed at the Site, extensive Site reconnaissance, records review, and interviews with Site personnel, a total of 74 AOIs were identified for further investigation based on their potential for having released hazardous waste and/or hazardous constituents. Data needs identified for these AOIs were presented in the RFI Work Plan.

2.3 RFI Investigations

This section describes the various investigation activities conducted during the RFI. These activities include development of a geographic information system (GIS) database to manage Site data, development and implementation of an RFI sampling and analysis program, and collection and analysis of soil, groundwater, and LNAPL samples.

2.3.1 GIS Database and Site Survey

As part of preparation of the Northend DOCC and Southend DOCC, a GIS database was developed for the Site using ArcView 3.2, current AutoCAD basemapping, aerial photography, and historical analytical data. This GIS database was provided as Appendix H of the Northend DOCC and updated as part of the RFI Work Plan.

Before the start of sample collection activities related to the RFI, a Site survey was completed, including the following:

- Preparation of a comprehensive Sitewide topographic map, using up-to-date aerial photography and incorporating the topographic map into the Sitewide GIS database;

- Performance of a Site boundary survey and incorporation of the survey into the Sitewide GIS database; and

- Completion of a survey of the horizontal coordinates and vertical elevations of the Sitewide monitoring well network and incorporation of the locations and elevations into the Sitewide GIS database.

Data collected pursuant to this RFI were also incorporated into the GIS database.

2.3.2 RFI Sampling and Analysis Program

The proposed RFI sampling program was designed to characterize the presence, nature, and extent of hazardous constituents in soil and groundwater at the Site related to potential releases from select AOIs. Additional data to assess the physical subsurface environment was also collected as part of the RFI. To identify data gaps and to evaluate the potential migration pathways at the Site, existing data were compared with generic screening criteria, as described in Section 2.3.3.

Protocols for the completion of sampling and analysis activities were presented in the *Field Sampling Plan/Quality Assurance Project Plan* (FSP/QAPP) provided as Appendix C of the RFI Work Plan and in the *Health and Safety Plan* (HASP) provided as Appendix E of the RFI Work Plan.

2.3.2.1 Boring/Well/Piezometer Installation and Sample Collection

The RFI Work Plan proposed the completion of one or more of the following for each AOI:

- *Soil Borings* – proposed at locations where only soil analytical data only were needed. Groundwater quality data were generally available at nearby locations;
- *Surface Soil Samples* – proposed to represent 0- to 2-foot depth interval soils within unpaved areas for purposes of human health risk evaluation;
- *Soil Borings with Grab Groundwater Sample Collection* – proposed at locations where soil and groundwater analytical data were needed, but groundwater elevation data were not needed;
- *Soil Borings/Possible Monitoring Wells* – proposed at locations where LNAPL delineation was needed and wells may have been installed depending on observed subsurface conditions;
- *Monitoring Wells* – proposed at locations where both groundwater quality and groundwater elevation data were needed, in addition to soil data; and
- *Piezometers* – proposed at locations where only groundwater elevation data were needed.

2.3.2.2 Soil Sample Collection

Visual Sample Characterization

At each drilling location, soil samples were collected continuously in 2-foot sections for visual classification and were screened with a photoionization detector (PID). At locations where potential LNAPL presence was of concern, shake tests were completed on samples collected near the water table and at other depth intervals chosen based on PID readings and visual observations.

Geotechnical Sample Collection

Soil samples were collected for geotechnical analyses at five locations at the Site during the RFI. The locations selected to collect soil samples for geotechnical characterization included sample locations RFI-05-09, RFI-07-08, RFI-36-01, RFI-55-01, and RFI-94-02. Representative soil samples were collected from the sand unit and the clay unit from each location and analyzed for grain-size distribution, moisture content, dry density, and organic content. Also, at each of the five sample locations, an attempt was made to collect a Shelby tube sample of the clay till unit for laboratory hydraulic conductivity analysis using American Society for Testing and Materials (ASTM) Method D5084. Due to the relatively high density of the till, only one Shelby tube sample was collected for analysis.

Analytical Sample Collection

Up to four soil samples were collected for laboratory analysis at each of the boring locations (i.e., monitoring well locations, soil boring locations, and soil boring/grab groundwater sample collection locations) in accordance with the following conventions:

- One soil sample was collected at each location from the ground surface (or immediately beneath pavement) to a depth of 2 feet (e.g., 6- to 24-inch-depth sample below 6 inches of pavement).
- One soil sample was collected from the 8- to 10-foot depth increment (for purposes of human health risk evaluation under the utility worker scenario), provided that this soil interval was not saturated.
- One soil sample was collected from the 2-foot depth increment immediately above the water table (top of the saturated zone).
- One other soil sample may have been collected based on high PID readings (greater than 10 parts per million [ppm]) or visual/olfactory evidence of contamination.

In addition, in some areas soil sampling was completed to target a specific depth interval(s) at "step-out" locations to evaluate the distribution of detected constituents.

Soil samples were analyzed for analytes listed in Table 2 of the FSP/QAPP. These analytes include Target Compound List (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), PCBs, a subset of the inorganic constituents present on the Target Analyte List (TAL) (inorganics), and several additional constituents previously detected at the Site that may affect human health. These constituents comprise the Project Analyte List (PAL) presented in Table 2 of the FSP/QAPP and are hereinafter referred to as the PAL constituents.

2.3.2.3 Groundwater Elevation Measurement and Groundwater Sample Collection

Two rounds of groundwater elevation measurements were taken Sitewide to develop current groundwater elevation contour maps (the previous round of contours was developed in 1995).

Groundwater elevation measurements were made to the nearest 0.01 feet during as short a duration as possible (generally within a 24-hour period), avoiding periods of rainfall that could change groundwater elevations within a measurement round.

Two types of groundwater samples were collected during the RFI. In some locations, grab groundwater samples were collected from temporary boreholes that were later backfilled with cement/bentonite grout, and in other locations, permanent monitoring wells were installed, developed, and sampled. In accordance with the RFI Work Plan, grab groundwater samples were collected at select locations throughout the drilling program. Note that at some locations, due to the low yield of the overburden deposits, particularly in the Southend of the Site, a PVC pipe with a machine-slotted well screen was temporarily placed in the borehole to allow collection of the required sample volume.

In September and October 2001, a Sitewide groundwater sampling event was performed at permanent monitoring wells using a peristaltic pump and low-flow groundwater sampling procedures. At the sampling locations with sufficient yield, specific-capacity testing was also completed during well purging, prior to sample collection.

Groundwater samples were analyzed for PAL constituents, including VOCs, SVOCs, PCBs (total and dissolved), and inorganics (dissolved). Note that prior to the initiation of the fall 2001 groundwater sampling event, the USEPA project manager expressed an interest in evaluating the appropriateness of using total versus dissolved PAL inorganics data. In response, total and dissolved samples for PAL inorganics analyses were collected during the fall 2001 sampling event; however, the total samples were placed on hold at the analytical laboratory, pending development of a plan to complete the evaluation. In coordination with the USEPA, a subset of 27 samples was identified for total analyses. The selected samples had been collected along the downgradient Site perimeter in order to conservatively assess off-site impacts. The results of the evaluation of this subset of samples are presented in Section 4.2.

2.3.2.4 LNAPL Delineation and Sample Collection

LNAPL is present at a number of locations at the Site, and one of the RFI objectives is to define the extent of LNAPL. Flexibility was built into the RFI Work Plan to allow the drilling program to be modified as needed in the field to define LNAPL extent. As illustrated on Figure 2-2, observations were made at all Site boring locations to determine if LNAPL was likely to be present. Based on the presence or absence of LNAPL indicators, a decision was made as to the need for a well at that location. Monitoring wells were installed if needed to:

- Differentiate between two distinct LNAPL types/sources in an area where LNAPL may be commingled;
- Monitor LNAPL thickness to evaluate LNAPL distribution or to monitor the progress of IMs; or
- Verify if LNAPL is present in sufficient quantity to accumulate in a well.

If LNAPL was identified at a boring location, and a monitoring well was not needed based on the above evaluation, the boring was abandoned, and supplemental boring(s) were completed as needed to define LNAPL extent.

An LNAPL sample was collected and analyzed for PAL constituents if previous data were not available for a particular LNAPL area.

2.4 Interim Measures

During previous investigations, GM identified areas of free-phase LNAPL beneath various areas of the Site. Additional areas of free-phase LNAPL were identified during the Phase I RFI. In areas where free-phase LNAPL has been identified, GM has undertaken activities to collect free-phase LNAPL in accordance with MDEQ requirements and to impede further migration of LNAPL. These activities include a combination of installing interim measures (IMs), collecting LNAPL from individual wells, and preparing designs for IMs to be installed in the near term. These IMs are being implemented to be consistent with, and part of, long-term corrective action activities that are anticipated for the Site to both meet the Environmental Indicators and to implement the final remedy at the Site. To date, IMs have been implemented to recover LNAPL at 10 different areas of the Site. In some areas, the IM has successfully depleted LNAPL; therefore, GM discontinued operation of the IM. As a result, five of the IMs are no longer in service. In addition, one IM was discontinued due to difficulties in maintaining recovery well pumps. The IMs are identified as follows:

IMs Taken Out of Service

- Building 32 Recovery Wells;
- Factory 03 Product Recovery Sump;
- Building 87/Leith Street Overpass Product Recovery System;
- Former Factory 94 Tank Farm; and
- Former Tank Farm at Building 04.

IMs Currently in Service

- Former Tank Farm 37 Product Recovery System;
- Factory 10 Groundwater Recovery and Treatment System;
- Factory 05 Product Recovery Trench; and
- Factory 81 Area Product Recovery Trench.

In addition, IMs are being designed for the following areas:

- Factory 36 Area Recovery Trench; and
- Factory 10 Scrapyard Area Recovery Trench.

Additionally, investigation at the following areas is under way to determine the need for IMs to address LNAPL discovered during the RFI:

- Factory 05 Building 43 Recovery Wells;
- Building 12;
- Factory 83/84;
- Building 16/40; and
- Former Hamilton Avenue Tank Farm.

Each of these former and current IMs, as well as the areas under design/investigation, are described in detail below and shown on Figures 2-4 and 2-5. At areas where LNAPL has been discovered during the RFI and other recent investigations, an LNAPL monitoring program has been initiated to measure the depth of LNAPL and to

remove LNAPL from the wells. The maximum and minimum LNAPL thickness measured during this program are presented in Table 2-6.

In parallel with the RFI investigation and LNAPL monitoring program, a storm sewer mitigation study is under way at the Site. This study will utilize a number of storm sewer investigation techniques (e.g., flow measurement, sampling/analysis, internal inspection) to identify areas of the Site storm sewers that may be potentially impacting water quality at permitted outfalls. The results of this study may identify storm sewer mitigation measures that could supplement IMs described in this section.

2.4.1 Inactive IMs

This section describes the IMs historically implemented by GM which have been discontinued because they have effectively removed free-phase LNAPL.

Building 32 Recovery Wells

Two recovery wells with electric total fluids pumps were installed in this area in response to an apparent axle oil release discovered during construction activities. Collected oil and water were discharged to the Site's industrial wastewater facility. As a result of this IM, measurable LNAPL is no longer present in the area. Therefore, the recovery system has been discontinued. The recovery wells, piping, and discharge systems are still in place in the event this system is needed in the future.

Factory 03 Product Recovery Sump

A roof drain/storm sewer sump located in the southern portion of Building 30A was historically identified to accumulate free product, determined to be S-7 quench oil. As a result, the sump was converted to a collection sump with belt skimmer to recover this oil. This recovery system was successful in recovering free-phase LNAPL proximate to the recovery sump, hence operation of this system has been discontinued. The pump and belt skimmer are still in place in the event this system is needed in the future. Residual LNAPL, believe to be related to this release, is present immediately downgradient at monitoring well 03-03; however, this monitoring well is being monitored and manually bailed as part of the Sitewide LNAPL monitoring program. From April 2001 to March 2002, the product thickness ranged from about 0 to 2 feet at monitoring well 03-03, and a total of approximately 3 gallons of product was recovered. Since July 2001, the product thickness has remained at less than 0.5 feet, and an absorbent sock is maintained in the well to remove this residual product.

Building 87/Leith Street Overpass Product Recovery System

Five former underground storage tanks (USTs) installed in 1936 were located south of Buildings 86/86A and Building 87 and east of Building 15. These five former USTs were removed in 1977. Based on the discovery of an oily sheen on the water in a nearby catch basin connecting to Storm Sewer Outfall 005, further investigations in the vicinity of the former UST area and historical operations in adjacent buildings were conducted. The results of the investigation indicated that a release of product had affected areas east, south, and west of the former UST area. Two product recovery wells were installed in an attempt to eliminate the migration of product into the catch basin connecting to Storm Sewer Outfall 005.

The product recovery wells extended to depths of approximately 36 feet below ground surface (bgs). These recovery wells were installed adjacent to the Leith Street overpass retaining wall. Recovered product was collected in an oil/water separator and discharged to the Site's industrial wastewater treatment system. An adjacent foundation drain for the retaining wall was plugged in early 2000. This recovery system was successful

in recovering free-phase LNAPL in this area, hence operation of this system has been discontinued. The recovery wells, pumps oil/water separator, and discharge systems are still in place in the event this system is needed in the future.

Monitoring wells RFI-86-03 and MW-FP7 have been monitored as part of the Sitewide LNAPL monitoring program. From May 2001 to February 2002, the product thickness ranged up to a slight sheen, and no product was recovered.

Former Factory 94 Tank Farm

The Former Factory 94 Tank Farm Area consisted of 10 USTs located at the northwest corner of Building 84. These tanks (ranging in capacity from 5,000 to 15,000 gallons) were reportedly installed between 1959 and 1972 and contained several grades of gasoline and solvent.

In 1991, as a follow-up to a confirmed release from this tank farm, nine of the tanks were removed and the tenth tank was closed in place. Several soil and groundwater investigations were performed in this area between 1991 and 1995. The results of these investigations led to IM activities consisting of the excavation and on-site thermal desorption of approximately 5,200 cubic yards (cy) of soil from within the Former Factory 94 Tank Farm Area.

After the presence of dissolved-phase constituents were identified in the groundwater, a sheetpile wall was installed west of Building 84B. The excavated area was then backfilled with clean soil. Three recovery wells were also installed with groundwater recovery pumps. These pumps were never operated because GM determined that the groundwater in the area met the cleanup criteria.

Former Tank Farm at Building 04

Four USTs previously existed near the southeastern corner of Building 04. These tanks, identified as Tanks 76 through 80 on a 1973 Site drawing, were reportedly installed in 1946 for the purpose of holding waste and product paints, lubricating oils, and reclaimable paint thinners, and were removed in 1984.

IM activities consisted of the excavation of approximately 2,500 to 3,000 cy of underlying soil removed in association with the removal of Tanks 76 through 80. As documented in the report entitled *RCRA Partial Closure Report, Hazardous Waste Storage Tanks, Factory 86, Building 04* (EDI Engineering & Science, October 1985), oil was observed seeping into the excavation during the removal at a depth of approximately 10 to 15 bgs. A french-drain-style collection system was installed in the excavation to collect residual oil for off-site disposal. The system consisted of a collection pipe positioned on a layer of pea gravel underlain by a 20-mil polyethylene liner. The collection pipe drained to a manhole that was periodically pumped using a vacuum truck. Only small quantities of oil were being collected by this system, and, due to limited recovery rates, its operation was later discontinued.

Two additional USTs (USTs 105 and 131) existed near the southeast corner of Building 04 and southwest corner of Building 44 (AOI 44-28). These USTs were reported to have been removed in 1985. UST 105 was a 1,000-gallon unleaded gasoline tank and UST 131 was a 750-gallon diesel fuel tank. According to Site personnel, diesel fuel was identified in subsurface soils during the removal of these USTs. As a result, two 8-inch-diameter recovery wells were installed along with an "auto skimmer" within one of the recovery wells to recover free product. Between November 1985 and March 1996, approximately 630 gallons of diesel fuel was reported to have been recovered. The auto skimmer system was discontinued on September 5, 1986.

A total fluids pump was installed in a recovery sump within a recovery trench at the south end of building 04. The trench was installed during the excavation of USTs. The discharge was piped to the Site's industrial wastewater treatment system. This recovery system was successful in recovering free-phase LNAPL in this area, hence operation of this system has been discontinued. The recovery trench, sump, and pump are still in place in the event this system is needed in the future; however, no electrical power or discharge systems are now available due to the demolition status of this area.

Monitoring wells 04-01 and 04-04 are being monitored as part of the Sitewide LNAPL monitoring program. In the period of May 2001 to January 2002, the product thickness ranged up to a slight sheen and no product was recovered.

2.4.2 Active IMs

This section describes the IMs implemented by GM, which are presently active.

Former Tank Farm 37 Product Recovery System

The former Tank Farm 37 contains a number of aboveground storage tanks (ASTs) and previously contained USTs that were subsequently removed. Both the ASTs and USTs contained gasoline, motor oil, hydraulic oil, and other oil products. A number of the USTs were suspected to have leaked. As part of initial abatement measures in February 1990, groundwater and free-product recovery trenches were installed along the east and south sides of the excavation area. These trenches are 3 feet wide and filled with gravel from approximately 2 feet bgs to approximately 14 feet bgs and are sloped toward a 26-inch-diameter recovery well/sump located along the south side of the excavation area. This recovery well/sump is installed to a depth of 17 feet bgs with screen placement at 6 to 13 feet bgs. In addition, a second sump was installed south of the newly constructed tank farm and is approximately a 26-inch-diameter and is constructed to 14 feet bgs. Collected fluids are routed to the Site's industrial wastewater treatment facility.

Both recovery sumps are being operated based on water level in the sump, which is at about the same elevation as the LNAPL. The two recovery sumps, as well as nearby monitoring wells 20-502, 20-503, and RFI-36-13, are being monitored and manually bailed as part of the Sitewide LNAPL monitoring program. From July 2001 to March 2002, the product thickness ranged from about 0.1 to 2.5 feet in the monitoring wells, and a total of approximately 11 gallons of product was recovered.

Factory 10 Groundwater Recovery and Treatment System

Free product was detected on the water table beneath and south of Building 20 within the Factory 10 Area. Fractions of this product included both water-soluble and insoluble phases of oil containing PCBs. In May 1997, GM installed a groundwater collection and treatment system designed to collect and treat soluble product and affected groundwater from this area. The system consists of seven groundwater extraction wells and associated distribution pipelines connected to a series of treatment components, including acidification, coalescing filtration, ultraviolet light oxidation, precipitation, clarification, and carbon adsorption. Treated groundwater is discharged to the Site storm sewer system through the roof drain under a National Pollutant Discharge Elimination System (NPDES) permit. Recently an organoclay filtration process was installed and the ultraviolet light oxidation process has been taken out of service.

The objective of this IM is primarily to collect and treat impacted groundwater; in so doing, the system also serves to contain and recover oil and LNAPL. The recovery system is operating at an average flow rate of 2 to 3 gallons per minute (gpm). In addition, this system is being used to treat other water containing PCBs on a batch

basis from around the Site. Monitoring wells 20-FP3, 20-FP6, 20-162, RW1-P1, and RW2-P2 are being monitored and manually bailed as part of the site-wide LNAPL monitoring program. From January 2001 to March 2002, the product thickness ranged from about 0 to 5.5 feet, and a total of approximately 25 gallons of product was recovered.

Factory 05 Product Recovery Trench

Investigations performed in 1994 in response to suspected releases in Building 43 within the Factory 05 Area detected free product on the water table along the southeast side of Building 43. These investigations indicated the presence of PCBs and other constituents in soil and groundwater. To address the LNAPL, three recovery trenches were installed as IMs in the Building 43 area in early 1995. These recovery trenches were each approximately 14 feet deep, 3 feet wide, 100 feet long, and backfilled with gravel. Product is recovered from these trenches via 30-inch-diameter recovery wells installed near the midpoint of each recovery trench. Automated belt skimming devices in the recovery wells collect product from the recovery trenches (with approximately 60% groundwater and 40% product) and transfer it to a temporary storage tote. Recovered water is periodically allowed to flow back into the recovery well and the recovered product is later drummed for disposal.

GM personnel report that up to one 350-gallon tote of product/water is recovered each year from each trench. Monitoring wells 43-160, 43-161, 43-162, 43-163, 43-164, and 43-165 are being monitored and manually bailed as part of the site-wide LNAPL monitoring program. From April 2001 to March 2002, the product thickness ranged from about 0 to 8 feet, and a total of approximately 125 gallons of product was recovered.

Factory 81 Area Product Recovery Trenches

Free product was detected during the 1995 Fenceline Investigation near the northeastern corner of Factory 81. This area was used for storage of foundry sand and steel from the manufacturing process. Subsequent subsurface investigations in this area indicated the presence of free product on the surface of groundwater and PCBs in LNAPL. A product recovery trench was installed as an IM in the area in 1996. This recovery trench is approximately 9 feet deep, 3 feet wide, 200 feet long, and includes perforated pipes and gravel backfill.. Product is recovered from the trenches via a 4-foot-diameter recovery well installed near the midpoint of the recovery trench. An automated belt skimming device in the recovery well collects product from the recovery trench and transfers it to a temporary storage tank. The collected product is then transferred to the groundwater treatment facility in Building 20.

Monitoring wells 70-101, 70-103, and 70-108 are being monitored and manually bailed as part of the Sitewide LNAPL monitoring program. From April 2001 to March 2002, the product thickness ranged from about 0 to 1.5 feet, and a total of approximately 12 gallons of product was recovered.

2.4.3 IMs Under Design

This section describes the IMs currently under design by GM.

Factory 36 Area

Free product has been detected on the water table immediately downgradient of a basement area in the southeastern portion of the Factory 36 Area. This free product is believed to result from former releases associated with the former chip processing operations performed within this basement area.

A preliminary design has been completed for a product recovery system for this area. The purpose of this IM is to collect free-phase LNAPL and to mitigate potential off-site migration of LNAPL and site-related constituents. This design consists of a recovery trench and pumps for both product recovery and groundwater drawdown. The proposed recovery trench would be approximately 20 feet deep, 3 feet wide, 160 feet long, and backfilled with gravel, including perforated pipe laterals. Product and groundwater would be recovered from the trench via product recovery pump(s) and groundwater submersible pump(s), respectively, installed in a 4-foot-diameter recovery manhole located near the midpoint of the recovery trench. Collected fluids would be transferred to a process waste sump in Building 36 and ultimately discharged to the Site's industrial wastewater treatment facility.

Free product has also been detected on the water table below the concrete floor within the Factory 36 Area. This is an active manufacturing area with approximately 150 to 200 underground sumps, tanks, and floor trenches that may contain oil. Within Factory 36, monitoring wells 36-160, 36-FP3, 36-FP4, 36-FP6, 36-FP7, RFI-36-06, RFI-36-07, RFI-36-15, RFI-36-16, RFI-36-21, RFI-36-22, RFI-36-23, RFI-36-26, RFI-36-27, and RFI-36-29 are being monitored and manually bailed as part of the site-wide LNAPL monitoring program. From January 2001 to March 2002, the product thickness ranged from about 0 to 10 feet, and a total of approximately 110 gallons of product were recovered. An investigation is under way to determine the sources of oil and to evaluate potential IM recovery systems.

Factory 10 Scrapyard Area

Several subsurface investigations have been performed in and around the Factory 10 Scrapyard Area since 1991. These investigations identified the presence of free product containing PCBs on the surface of groundwater outside the southeastern corner of Factory 10 and in the scrapyard area.

A preliminary design has been completed for a product recovery system as an IM to recover LNAPL containing PCBs and to create hydraulic control at the downgradient plume edge. This design consists of a recovery trench and pumps for both product recovery and groundwater drawdown. The proposed recovery trench would be approximately 20 feet deep, 3 feet wide, 300 feet long, and backfilled with gravel, including perforated pipe laterals. Product and groundwater would be recovered from the trench via product recovery pump(s) and groundwater submersible pumps(s), respectively, installed in a 4-foot-diameter recovery manhole located near the midpoint of the recovery trench. LNAPL would be segregated by an oil/water separator and would be disposed of offsite, while recovered groundwater would be transferred to the groundwater treatment facility located within Building 20.

Monitoring wells 20-FP4, 20-FP7, and 20-FP8 are being monitored and manually bailed as part of the Sitewide LNAPL monitoring programs. From January 2001 to March 2002, the product thickness ranged from about 0 to 2.5 feet, and a total of approximately 20 gallons of product was recovered.

2.4.4 Other LNAPL Areas Under Consideration

This section describes several other LNAPL areas being considered by GM for additional investigations to determine the need for IMs.

Factory 05 Building 43 Recovery Wells

A release of an estimated 4,000 gallons of cutting oil was identified in April 1997. Three 4-inch-diameter groundwater monitoring wells were installed to the east of the tank from which the release was thought to have

occurred. Product was identified in two monitoring wells. Two pneumatic free-product recovery pumps were installed as IMs in the wells and initially discharged to the process waste treatment sewer catch basin located adjacent to the tank. Approximately 1,000 gallons of product were recovered and discharged to the process waste catch basin. Due to the subsequent discovery of PCBs in the LNAPL, the recovered total fluids were later piped to two product storage tanks located within Building 43. When the system was operating, the LNAPL was reportedly causing malfunction of the recovery pumps. As such, the system is currently not operating.

Monitoring wells RFI-05-11, RFI-05-13, RFI-05-14, RFI-05-21, and the two monitoring wells that once contained the pneumatic free-product recovery pumps are being monitored and manually bailed as part of the site-wide LNAPL monitoring program. In the period of July 2001 to March 2002, the product thickness ranged from about 0 to 5 feet and a total of approximately 25 gallons of product was recovered. An assessment of data collected to date is underway to determine if an IM in this area is necessary.

Building 12

During the RFI, evidence of LNAPL was discovered in the northwestern and eastern portions of Building 12. Monitoring wells RFI-12-02, RFI-12-05, RFI-12-11D, RFI-12-11S, RFI-12-14 and RFI-12-15 are being monitored and manually bailed as part of the Sitewide LNAPL monitoring program. From August to October 2001, the product thickness ranged from about 0 to 1.7 feet, and a total of approximately 1 gallon of product was recovered. However, demolition activities are under way in the area, so the LNAPL monitoring program has been temporarily halted since October 2001. Additional investigation in this area is also planned when the demolition activities are completed. At the conclusion of these activities, the need for an IM in this area will be determined.

Factory 83/84

During the RFI, evidence of LNAPL was discovered in Factory 83/84, which is in Building 32. It is unclear if this recent discovery is related to a previous axle oil release in this area as discussed in Section 2.4.1. Monitoring wells RFI-83/84-03, RFI-83/84-06, and RFI-83/84-07 are being monitoring/manually bailed as part of the Sitewide LNAPL monitoring program. From October 2001 to March 2002, the product thickness ranged from about 0.3 to 2 feet, and a total of approximately 7 gallons of product were recovered. An assessment of data collected to date is under way to determine if an IM in this area is necessary.

Building 16/40

During recent investigations, three 10,000-gallon USTs were identified east of Building 16, and north of the Building 40/Building 16 tunnel. At least one of the USTs was identified as having released product. An initial assessment report was submitted to MDEQ in September 2001, and follow-up activities related to these tanks will be undertaken when demolition activities are completed in this area.

Monitoring wells RFI-16-01, RFI-16-04, RFI-16-07, RFI-16-08, RFI-16-09, RFI-16-10, RFI-16-11, and RFI-16-21 are being monitored and manually bailed as part of the Sitewide LNAPL monitoring program. From August 2001 to February 2002, the product thickness ranged from about 0 to 1.3 feet, and a total of approximately 2 gallons of product was recovered. However, the LNAPL monitoring program has been temporarily halted since February 2002 due to demolition activities in the area.

Once demolition activities are completed, the follow-up activities related to the three USTs and the LNAPL monitoring program will resume. Based on the results from these activities, the need for an IM in this area will be determined.

Former Hamilton Avenue Tank Farm

In 1986, thirteen 12,000-gallon USTs were removed from the Hamilton Avenue Tank Farm located on the southeastern corner of Hamilton Avenue and Industrial Avenue within the Building 09 Area. Since July 1996, numerous soil borings and groundwater monitoring wells have been installed within and near the former UST area. In addition, geophysical investigations have indicated that additional former USTs may be located east of this area.

Several rounds of groundwater sampling have been performed, with benzene, toluene, ethylbenzene, and xylene (BTEX) being detected. The extent of the dissolved-phase plume is still being defined, and the need for an IM for this area has not yet been identified.

Monitoring well 31-7 is being monitored and manually bailed as part of the Sitewide LNAPL monitoring program. From April 2001 to March 2002, the product thickness ranged from about 0 to 5 feet, and a total of approximately 40 gallons of product was recovered. However, almost all of that product was removed in 2001 and the product thickness has been generally below 0.5 feet since September 2001.

3. Environmental Setting

This section describes the environmental setting at the Site, including topography, climate, hydrology, geology, hydrogeology, surface water/drainage, and land use and demographics .

3.1 Topography

The topography of the Site is fairly flat, although the regional topography slopes east-southeast towards the Flint River. The ground surface elevation drops approximately 35 feet between Industrial Avenue at the western property boundary and James P. Cole Boulevard at the eastern property boundary, in close proximity to the Flint River. The river is approximately 100 feet east of the Southend of the Site and approximately 3,000 feet east of the Northend of the Site.

3.2 Climate

Since day-to-day weather is controlled by the movement of pressure systems across the nation, this area seldom experiences prolonged periods of hot, humid weather in the summer or extreme cold during the winter. The prevailing wind is southwesterly, averaging 10 mph. Flint experiences some lake-effect snow. The average mid-day relative humidity varies from 54% in May to 73% in December, and averages 62% annually.

Summers are dominated by moderately warm temperatures with a 1964 to 1993 annual average of 6.6 days exceeding 90°F. An annual average of 139.3 days had minimum temperatures of 32°F or lower. The highest average monthly maximum temperature of 88.8°F was recorded July 1955, and the lowest average monthly minimum temperature of about 4°F was recorded February 1978.

Precipitation is generally evenly distributed throughout each year with an average annual total for 1942 to 2000 of 31 inches. During this same period, the average wettest month was September, averaging 3.56 inches of precipitation, while the average driest month was February, averaging 1.28 inches of precipitation. Summer precipitation comes mainly in the form of afternoon showers and thundershowers.

The 1942 to 2000 average seasonal snowfall was about 45.1 inches. During the 1964 to 1993 period, 14.3 days per season averaged 1 inch or more of snow on the ground, but this varied greatly from season to season.

3.3 Regional Hydrology

The Flint watershed consists of approximately 1,360 square miles. The median daily discharge flow for the Flint River is approximately 400 cubic feet per second (cfs). Stream flow varies widely as a function of precipitation and runoff throughout the year and from season to season.

The Flint River flows north to south through the City of Flint. The slope is approximately 2 feet per mile through this reach. There are four major tributaries to the Flint River in the study area: Butternut, Kearsley, Thread, and Swartz creeks. The aqueous geochemical signatures of the surface waters tend to be of the bicarbonate type with high concentrations of calcium and magnesium. The pH of these waters can be as high as 8.6 standard units. Most of the tributary waters flow from upland glacial moraines, and all of the surface waters are receptors of groundwater discharge.

3.4 Regional Geology

The geology of central Genesee County is dominated by two primary stratigraphic units consisting of unconsolidated glacial deposits of Pleistocene age, underlain by sandstone bedrock. The surficial glacial deposits are composed of a sequence of moraines, outwash and glacial channels, lake bed sediments, and till plains. These deposits are underlain by glacial drift or till consisting primarily of clay with lesser amounts of sand and silt. These overburden materials are underlain by bedrock of the Saginaw Formation, consisting of Pennsylvania age sandstones and limestones.

3.4.1 Overburden

The regional landscape of Flint and the surrounding area consists of gently rolling topography. This topography includes a gently sloping ground moraine, broken by several outwash channels and also by numerous end-moraine ridges, some having slightly greater relief than the surrounding ground-moraine topography. Local relief of less than 50 feet is found over areas of several miles. The greatest regional elevation changes are along outwash channels, which are commonly accompanied by steep slopes and are 50 to 100 feet lower than the adjacent ground moraine.

The underlying glacial till deposits are typically fine-grained materials (clays and silts) with low permeability (Wiitala, et al., 1963). The till is grayish brown and poorly sorted. Locally, the till includes lenses and/or layers of more permeable silts and sands that are not extensive horizontally or vertically (Geraghty & Miller, 1986).

3.4.2 Bedrock

The bedrock geology in the region consists primarily of sandstone and limestone formations characteristic of the eastern-central portion of the Michigan Basin. These Pennsylvanian- and Mississippian-age formations include the Saginaw, Bayport, Michigan, and Marshall formations (Wiitala, et al., 1963). In the Flint area, the Saginaw Formation underlies the glacial till deposits and is composed of sandstone, sandy shale, shale, coal, and limestone. The sandstone layers are the primary source of groundwater from this formation. The Saginaw Formation is the results of cyclical sedimentation processes, and consists of numerous successions of sandstone overlain by sandy shale, gray shale, coal, black shale, and limestone.

3.5 Regional Hydrogeology

The regional groundwater flow direction within the sandstone bedrock is generally to the north across Genesee County, with groundwater eventually discharging to Saginaw Bay and Lake Huron (Wiitala, et al., 1963). In the Flint area, groundwater is found within the glacial till, which includes various sand and gravel deposits, and in the underlying bedrock. Groundwater flow within the glacial overburden deposits in the vicinity of the Site is toward the Flint River and its tributaries to the east and southeast. Regionally, two distinct water-bearing zones are identified, as discussed in the following sections:

Glacial Drift Groundwater Zone

Discontinuous sand layers are present within the till, can be fully saturated, and have a higher short-term yield than the glacial till. However, the glacial drift groundwater zone is not used as a source of groundwater due to limited yield available from this zone.

Bedrock Groundwater Zones

Bedrock groundwater zones are found within the Saginaw Formation, Michigan Formation, and Marshall Formation.

The Saginaw Formation is the primary source of groundwater in the Flint area. Several production wells installed in this formation were previously used for industrial and public water supply. As alternative sources of water became available, these wells were taken out of production due to the poor quality (hardness and dissolved solids) of the groundwater. Currently, there are no known active production wells at the Site.

The Michigan Formation is not considered to be an important source of groundwater in the Flint area. There are no known active production wells that use this formation as a source of groundwater (Huffman and Whited, 1993).

The Marshall Formation provides only a small percentage of the groundwater used in Genesee County. In the Flint area, there are no known active production wells that use this formation as a source of groundwater (Huffman and Whited, 1993).

3.6 Surface Water/Drainage

Surface water drainage patterns at the Site are generally east and southeast, toward the Flint River, which is the nearest surface water body. Paved surfaces, parking lots, and structures cover more than 80% of the Site. Local surface drainage is collected by the Site storm sewer drainage system, which also services areas within the western portion of the City of Flint upstream of the Site. The storm sewer system at the Site includes 13 outfalls (outfalls 001 through 013), as shown on Figure 1 of Appendix F of the Southend DOCC (BBL, 2000a) and Figure 1 of Appendix A of the Northend DOCC (BBL, 2000b). This system discharges via outfalls 001 through 013, located along the Flint River, which are monitored by GM in accordance with GM's NPDES permit.

3.7 Site-Specific Geology

The subsurface deposits at the Site have been characterized through the completion of numerous soil borings for site-specific investigations. Historical soil boring logs were provided in Appendix A of the RFI Work Plan. During the recent RFI activities, over 250 soil borings were completed to collect soil and groundwater samples for laboratory analyses (Tables 2-1 and 2-2). Soil boring logs for the RFI activities are provided in Appendix A of this report. Geotechnical analyses completed during the RFI are presented in Table 3-1 and Appendix B. Figures 3-1 through 3-7 present general cross sections of the major geologic units for the Site.

The overburden deposits identified at the Site can be grouped into the following units: fill material, silty sand, silty clay, and bedrock. Each of these units is described below.

Fill Material

Fill material is present beneath most areas of the Site due to various construction activities, such as existing or former buildings, loading docks, manufacturing facilities, and material storage areas. Fill material typically consists of sandy deposits, thought to be foundry sand. In some areas, the sandy fill material contains other debris, including coal chips, slag fragments, and metal shavings. The fill material is thickest (up to approximately 15 feet) in the vicinity of boring 20-169 (Building 20) on the Northend of the Site. The fill material is thin (approximately 1.5 feet) in the vicinity of boring SBFL3-23 (near Building 02) on the Southend of the Site, and is absent entirely in scattered areas of limited extent.

Silty Sand

In the Northend of the Site, a silty sand unit of variable thickness is present beneath the fill material. Interbedded with the silty sand unit are discontinuous layers of silt and clay. This silty sand unit generally thins toward the south and is absent in some portions of the Site south of Leith Street. Where present, this unit ranges in thickness from 5 to 25 feet.

Silty Clay

A dense silty clay glacial till deposit underlies the silty sand at the Site. The silty clay till grades to clayey silt in some areas and contains discontinuous sand seams and lenses. The estimated thickness of the glacial till in the Flint area ranges from 50 to 100 feet (Humphrys, 1960).

Bedrock

Bedrock consisting of sandstone, sandy shale, shale, coal, and limestone (Saginaw Formation) is reported to be present beneath the Site at depths of approximately 60 to 80 feet bgs. Bedrock was not encountered in the soil borings completed for the RFI. Sandstone bedrock was encountered at about 60 feet bgs at boring OW-4 (GM-4) near the west side of the Aeration Lagoons (Geraghty & Miller [G&M], 1986).

3.8 Site-Specific Hydrogeology

The hydrogeology of the Site is characterized by a shallow groundwater zone with a depth to the water table typically ranging from approximately 6 to 16 feet bgs. The sandy fill materials and silty sand soil units can be partially or fully saturated depending on the horizontal distribution and depth of soils and seasonal fluctuations in the water table.

The wide variation in the horizontal and vertical distribution of permeable sandy fill materials combined with an underlying low-permeability till unit produces localized water table mounds and perched zones. Also, the location and depth of subsurface structures (e.g., basements), recovery wells, and utilities (e.g., storm sewers) locally affect the depth to the water table and the direction of groundwater movement. Hydraulic conductivity values measured at shallow monitoring wells installed during the RFI in the sandy fill materials and silty sand soil units ranged from approximately 1.3×10^{-2} centimeters per second (cm/sec) to 3.3×10^{-4} cm/sec, based on specific-capacity tests (see Table 2-2). Hydraulic conductivity values measured at shallow monitoring wells installed within silt and clay ranged from approximately 3.1×10^{-5} cm/sec to 3.1×10^{-6} cm/sec. The variability in the hydraulic conductivity data is due to the heterogeneity of the overburden materials. Nevertheless, the sandy fill and silty sand soil units are considerably more permeable than the silt and clay layers.

The underlying glacial till unit is predominantly a low-permeability unit that even when fully saturated does not readily transmit groundwater. This unit has been characterized as an aquitard based on the unit's low hydraulic conductivity and low yield. Based on the analysis of a Shelby tube sample by a geotechnical laboratory, the vertical hydraulic conductivity of this unit is approximately 7.9×10^{-8} cm/sec. Monitoring wells were not installed in the till clay unit during the RFI.

Site groundwater elevation measurements collected on September 10 and 11, 2001 (Table 3-2) were used to prepare a Sitewide groundwater elevation contour map (Figure 3-8) and to determine the direction of groundwater flow. Generally, groundwater in the northern portion of the Site (Factory 38 and Factory 36 areas) flows to the northeast and shifts to the east and southeast in the central portion of the Site (Factory 43, Building 20 areas). In the south central and southern portions of the Site, the direction of groundwater flow is primarily to the southeast. As previously stated, localized fluctuations in the direction of groundwater flow patterns are observed near subsurface structures (e.g., basements) and utilities that intercept shallow groundwater. Such influences can be observed in the Building 12 areas on the south side of the Site and also near Buildings 30 and 70 on the north side of the Site due to a storm sewer. Other manmade features that affect the direction of groundwater are the Leith Street Overpass and the recovery well system operating in the Building 20 Area.

There are no active drinking or industrial water production wells at the Site. All potable water is obtained from the City of Flint. G&M (1986) estimated the hydraulic conductivity of the Saginaw Formation bedrock aquifer to be at least two orders of magnitude higher than that of the overlying till.

3.9 Land Use and Demographics

The Site is located in Flint, Michigan, in the southeastern portion of Michigan in Genesee County, which is approximately 649 square miles in area. The City of Flint has a population of approximately 143,000, which accounts for 33% of the approximately 437,000 residents of Genesee County. Approximately one-third of the land area of Genesee County is used for agriculture. The City of Flint receives all of its potable water by pipeline from Detroit. The source of the water is Lake Huron, located approximately 60 miles east of the Site.

The vicinity of the Site includes industrial, commercial, and residential areas. Interstate I-475 and the Flint River are directly east of the Site. Several companies are located between the Site and the Flint River, including Bell's Produce, PPG Industries, Kasle Steel/Auto Blankers, Flint Coatings, and Lockhart Chemicals. An idle DuPont facility is located southeast of the Site. Directly to the north and west of the Site are predominantly residential neighborhoods. The remaining areas east, west, and north of the Site are generally occupied by residential neighborhoods and several other companies, including Unit Terminal (GM-owned), Universal Systems, Tru-Coat, Inc., Flint Plating (formerly Pro-Met Plating), and Associated Truck. South of the Site are sparsely occupied residential and commercial areas. The Site is zoned industrial. Future on-site land use is expected to remain industrial.

4. Investigation Results and Discussion

This section presents a summary of the results of the field investigations completed during the RFI. Section 4.1 describes the MDEQ screening criteria used during this investigation. Section 4.2 presents an evaluation of the use of total and dissolved PAL inorganics analytical data. Section 4.3 presents a discussion of overall data quality. Section 4.4 presents the results of investigations of the 37 AOIs north of Leith Street described in the RFI Work Plan. Section 4.5 presents the results of investigations of the 37 AOIs south of Leith Street described in the RFI Work Plan. Section 4.6 presents the results of investigations of 4 new AOIs not previously described in the RFI Work Plan.

The results of the field investigations completed during the RFI are discussed in the following subsections by operational areas (Northend and Southend). Each subsection includes a description of the AOI or area investigated, the scope of the field investigation, a summary of the results, and discussion of the results with respect to whether an exceedance of screening criteria has been identified. A more detailed description of each AOI is provided in the Southend DOCC (BBL, 2000a) and the Northend DOCC (BBL, 2000b). Figures 4-1 through 4-28 present all soil sampling locations and groundwater monitoring well locations, as well as specific Site features that include roads, buildings, fences, and railroads. These figures also present the results of analytical data screening against MDEQ criteria as described in Section 4.1. Analytical results for soil, groundwater, and LNAPL samples are presented in Appendices C, D, and E, respectively.

4.1 Generic Michigan Department of Environmental Quality (MDEQ) Screening Criteria

The identification of a potentially significant release at an area is based on comparison of the characterization data collected during the RFI with generic risk-based screening criteria. The approach for evaluating the soil and groundwater data is discussed below.

Surface and subsurface soil and groundwater analytical data were compared with screening criteria, based on the Michigan Part 201 generic screening criteria that the MDEQ has developed under the authority of the Natural Resources and Environmental Protection Act (NREPA) (1994 PA 451, as amended). These screening criteria are presented in MDEQ's Operational Memorandum No. 18 (updated June 2000). The specific screening criteria used for soil and groundwater PAL constituents in this investigation are presented in Tables C-2 and D-3 of Appendices C and D, respectively.

Surface and subsurface soil analytical data were compared to the following generic MDEQ criteria:

- Industrial Direct Contact (IDC);
- Industrial Soil Volatilization to Indoor Air (ISVIA);
- Industrial Infinite Source Volatile Soil Inhalation (IVSIC); and
- Industrial Particulate Soil Inhalation (IPSIC).

Groundwater analytical data were compared to the following generic MDEQ criteria:

- Industrial Drinking Water Criteria (IDW);
- Industrial Groundwater Volatilization to Indoor Air (IGVIA);
- Groundwater Contact (GCC);

- Groundwater Acute Inhalation (GAI); and
- Flammability and Explosivity (FE).

Note that as a conservative approach to screening Site data, groundwater analytical data collected at Site monitoring wells located within 500 feet of the Flint River were compared with Groundwater/Surface Water Interface (GSI) Criteria. However, it is not believed that the GSI is accurately reflected by wells located this far from the river, and the criteria were used only as a basis to propose additional monitoring wells.

This conservative approach was also followed with respect to application of the generic MDEQ Residential Drinking Water (RDW) Criteria. For screening purposes, all of the groundwater data, regardless of sampling location, were compared to the RDW to make decisions regarding additional sampling requirements.

Determination of the extent of contamination and need for further action at an AOI or off-site area was based on exceedances of the screening criteria. If soil and groundwater analytical results associated with an AOI exceeded the screening criteria, additional investigations were completed or are proposed to provide sufficient information to characterize the nature and extent of constituents potentially of concern.

4.2 Evaluation of Total Versus Dissolved PAL Inorganics Data

As described in section 2.3.5, dissolved (filtered) groundwater samples were submitted for analysis of PAL inorganic constituents in accordance with the approved RFI Work Plan. During the investigation, the USEPA project manager requested an evaluation of the appropriateness of using total versus dissolved inorganic data. In response, total samples were collected during the fall 2001 sampling event; however, the samples were held by the analytical laboratory, pending development of a plan to complete the evaluation. To avoid exceeding the relatively short holding times of mercury and cyanide, all of the held samples were analyzed for total mercury and total cyanide.

To complete an evaluation of total and dissolved PAL inorganics analytical data, 27 samples were selected for total (unfiltered) analyses. This subset of samples was collected from monitoring wells that were located along the downgradient Site perimeter, and had measured field turbidities of 50 nephelometric turbidity units (NTUs) or less (Appendix F). A total of 22 random additional samples were also analyzed for total inorganic constituents during the period of time that this evaluation was in progress. As a result of the various analyses, over 1,200 pairs of total and dissolved data (e.g., sets of total and dissolved data for single analytes) are available.

All of the collected data were compared to the screening criteria. Analytical variability was also considered by looking at the variability between primary and duplicate sample results. As a result of this evaluation, it was determined that use of the total PAL inorganics data for samples exhibiting relatively low turbidity values would not lead to substantively different RFI conclusions. In other words, although there are statistical differences between the two data sets, the variations are not significant when compared with the screening criteria. This evaluation and the resulting conclusions are presented in a letter from GM to the USEPA, dated March 5, 2002, and included in Appendix F. As a result of this evaluation, future PAL sample analysis will be completed for total PAL inorganics constituents; however, due to the potential for the entrainment of non-mobile particulates in samples, which could result in non-representative data, dissolved (filtered) samples may also be collected at select locations.

4.3 Data QA/QC Summary

Data from 97 sample delivery groups (SDGs) for samples from all environmental media collected between December 2000 and March 2002 were reviewed for quality assurance/quality control compliance with method guidelines and project-specific requirements. Each SDG data package received from the laboratory (CT&E, Inc. of Ludington, Michigan) was reviewed as outlined in the FSP/QAPP. Specifically included in this review was an evaluation of holding times, calibration requirements (initial and continuing), blank contamination, internal standard recovery, surrogate recovery, matrix spike and duplicate performance, laboratory control sample recovery, field duplicate and analyte identification, as applicable.

A number of data were qualified as estimated and possibly biased high or low due to minor quality control deviations. A small percentage of the data set was qualified as unreliable based on more significant quality control deviations. Completeness, defined as the percentage of measurements that are judged to be valid or usable to meet the prescribed data quality objectives for this analytical data set, was 99.7%. The completeness percentage is greater than the minimum required usability of 90 percent as specified in the FSP/QAPP. Overall, the data that were not qualified as unreliable were found to be acceptable for use as reported by the laboratory and, at times, as qualified as estimated by the data validator. For a complete explanation of qualified sample results based on the data validator's review of each SDG, refer to Appendix G.

A QA/QC issue requiring corrective action was identified during the grab water sampling (i.e., temporary wells) as part of the well location activities. The grab water samples were being submitted to the laboratory for quick turn analysis to help identify appropriate locations to install monitoring wells. Of the first 64 grab water samples collected, 51 had detections of bis(2-ethylhexyl)phthalate (BEHP) with concentrations ranging from 0.93 J micrograms per liter (µg/L) to 860 µg/L. In many samples, this was the only organic constituent detected, and for some samples, it was the only constituent above its screening criteria.

Since BEHP can be a common laboratory contaminant and there is no reason to believe it to be site-related, the potential source of these frequent detections of BEHP was investigated. The laboratory blanks associated with the grab water samples did not have BEHP present. To test other sources, two field blanks collected from the dedicated sampling tubing, and a sample of the tubing material were submitted to the laboratory for analysis of BEHP. BEHP was detected in both field blanks, at concentrations of 29 µg/L and 52 µg/L, and in the digested tubing sample at a concentration of 120 J µg/kg, indicating the tubing was the likely source of the BEHP detected in the grab water samples.

Based on these detections, a corrective action was taken whereby the tubing was replaced with another tubing source. Of the 233 groundwater samples collected after switching tubing, only 16 samples had BEHP detections with a maximum concentration of 4.5 J µg/L. Therefore, the source of the BEHP appeared to be related to the original tubing utilized. The BEHP data for samples collected using the original tubing are presented in the Phase I report. However, the detection of BEHP at locations impacted by the original tubing source has not been used to identify locations requiring additional sampling and BEHP detections above screening criteria at these locations are not identified in Sections 4.4 and 4.5.

4.4 AOIs North of Leith Street

Results of investigations of 37 AOIs north of Leith Street are detailed below.

4.4.1 AOI 38-1 (Process Waste Sumps, Trenches, and Former Hydraulic Car Lifts)

This AOI is located in the northern portion of Building 38 and consists of several process waste sumps, trenches, and former hydraulic car lifts. To assess potential impacts from hydraulic and waste oil handled in these areas, three soil borings and three monitoring wells were installed within this AOI. Two existing monitoring wells (36-101 and 38-120) were also sampled. The locations of these soil borings and monitoring wells are shown on Figures 4-1 and 4-2.

4.4.1.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	6	22	22	22	22	--	--
Groundwater	5	6	6	6	6	6	7 + 1 Tl

4.4.1.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 38-1 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Thallium	4.9	IDW (2.0)
Beryllium	34	IDW (4.0)

4.4.1.3 Conclusions

The RFI soil data from AOI 38-1 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 38-1 indicate screening criteria were exceeded for thallium and beryllium. Based on these results, monitoring well RFI-38-06 will be sampled for inorganic constituents during the next round of groundwater sampling. Further action is pending the outcome of the next round of data collection.

4.4.2 AOI 36-1 (Engine Manufacturing and Metal Machining Processes)

This AOI is located in the northern and central portions of Building 36 and was associated with engine manufacturing and metal machining processes. To assess the extent of historical releases of hydraulic oils, cooling/cutting oils/fluids, and/or process waste oils, 13 soil borings and 19 monitoring wells were installed within this AOI. In addition, existing monitoring wells 36-100, 36-120, 36-121, and 36-FP1 were sampled. The locations of these soil borings and monitoring wells are shown on Figures 4-3 and 4-4.

4.4.2.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	32	106 + 10 BTEX	92	69	92 + 6 As	--	--
Groundwater	22	25	19	19	7 + 13 CN/Hg	19	21
NAPL	3	3	3	--	--	--	--

4.4.2.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituents detected in soil samples that exceeded the screening criteria is presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Benzene	240	IVSICI (45) ISVIA (8.4)
Ethylbenzene	680	IDC (140) ISVIA (140)
Toluene	4,100	IDC (250) IVSICI (3,300) ISVIA (250)
Xylenes (total)	2,500	IDC (150) ISVIA (150)

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
1,1,1-Trichloroethene	950	IDW (200)
1,1-Dichloroethene	120	IDW (7.0)

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
cis-1,2-Dichloroethene	150	IDW (70)
Trichloroethene	99	IDW (5.0)
Benzene	6,000	IDW (5.0)
Ethylbenzene	1,300	IDW (700)
Toluene	20,000	IDW (1,000)
Vinyl Chloride	74	IDW (2.0)
Arsenic	85	IDW (50)
Beryllium	30	IDW (4.0)
Chromium (total)	220	IDW (100)
Vanadium	210	IDW (62)

4.4.2.3 Conclusions

The RFI soil data from AOI 36-1 indicate that screening criteria were exceeded for BTEX. The physical extent of these exceedances has been defined; therefore, no additional investigation activities are planned.

The RFI groundwater data from AOI 36-1 indicate that screening criteria were exceeded for several VOCs and inorganic constituents. The physical extent of the VOC exceedances has not been defined. Based on these results, two additional monitoring wells (RFI-36-47 and RFI-36-48) will be installed downgradient of the suspected exceedance area. These monitoring wells (and existing monitoring wells RFI-36-35 and RFI-36-46) will subsequently be sampled for VOCs and inorganic constituents during the next round of groundwater sampling. Further action is pending the outcome of the next round of data collection.

4.4.3 AOI 36-2 (Metal Chip Processing Area)

This AOI is the basement area located along the eastern side of the central portion of Building 36 and is associated with metal chip processing. LNAPL has historically been detected in this area. To assess the extent of dissolved-phase constituents and to further delineate the extent of LNAPL associated with process waste oils, five soil borings and two monitoring wells were installed at this AOI. In addition, existing monitoring wells 36-FP2 and 36-FP5 were sampled due to previous criteria exceedances. The locations of these soil borings and monitoring wells are shown on Figures 4-3 and 4-4.

4.4.3.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	7	11	8	5	4 +3 Cr/Cr(VI)	--	--
Groundwater	4	4	3	3	1 +2 CN/Hg	3	3

4.4.3.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituents detected in soil samples that exceeded the screening criteria is presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Chromium (total)	450	IPSIC (240)

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Benzene	4,000	IDW (5.0)
Vinyl chloride	2.7	IDW(2.0)
Arsenic	170	IDW (50)

4.4.3.3 Conclusions

The RFI soil data from AOI 36-2 indicated that total chromium in soils exceeded screening criteria for hexavalent chromium. An additional sample was collected to determine the concentration of hexavalent versus trivalent chromium. These additional data indicate that hexavalent chromium concentrations in soils at this AOI were less than the screening criterion. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 36-2 indicate that screening criteria were exceeded for benzene, vinyl chloride, and arsenic. The physical extent of the exceedance in this area has been delineated; therefore, no additional investigation activities are planned.

The physical extent of LNAPL in this area has been delineated. An IM is being developed for this area to address the LNAPL, as discussed in Sections 2.4 and 5.3.

4.4.4 AOI 36-3 (Engine Assembly, Waste Oil Collection and Processing, Former USTs)

This AOI is the basement area located beneath the southeastern corner of Building 36 and is associated with a final engine assembly area, main process waste oil collection/processing operations, and several former USTs. To investigate potential releases from this area, five monitoring wells were installed at this AOI. In addition, existing monitoring well 36-FP8 was sampled, and two groundwater infiltration grab samples were collected from the basement area. The locations of these soil borings and monitoring wells are shown on Figures 4-3 and 4-4.

4.4.4.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	5	13	13	10	10	--	--
Groundwater	7	8	7	7	2 +3 CN/Hg	6	6

4.4.4.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 36-3 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
1,1-Dichloroethene	10	IDW (2.0)
cis-1,2-Dichloroethene	1,000	IDW (70)
Benzene	590	IDW (5.0)
Tetrachloroethene	150	IDW (5.0)
Toluene	2,800	IDW (1,000)
Trichloroethene	360	IDW (5.0)
Vinyl chloride	140	IDW (2.0)
Beryllium	8.1	IDW (4.0)
Chromium	190	IDW (100)
Vanadium	380	IDW (62)

4.4.4.3 Conclusions

The RFI soil data from AOI 36-3 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 36-3 indicate that screening criteria were exceeded for several VOCs and inorganic constituents. The physical extent of the exceedances associated with VOCs has been defined; however, the physical extent of the exceedances associated with inorganic constituents has not been defined. Based on these results, monitoring wells RFI-36-09, RFI-36-20, and 36-FP8 will be sampled for inorganic constituents during the next round of groundwater sampling. Further action is pending the outcome of the next round of data collection.

4.4.5 AOI 36-4 (Former Metal Machining and Active Engine Assembly)

This AOI is located in the south-central and southeastern portions of Building 36 and is associated with former "wet" metal machining operations and several active engine assembly operations. To assess potential impacts in these areas, 2 monitoring wells were installed within this AOI. The locations of these monitoring wells are shown on Figures 4-3 and 4-4.

4.4.5.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	2	5	5	0	5	--	--
Groundwater	2	2	2	2	2 CN/Hg	2	2

4.4.5.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 36-4 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the groundwater samples from AOI 36-4 do not exceed the screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.4.5.3 Conclusions

The RFI soil data from AOI 36-4 indicate that no screening criteria were exceeded. Based on these results, no further groundwater investigation will be performed.

The RFI groundwater data from AOI 36-4 indicate that no screening criteria were exceeded. Based on these results, no further groundwater investigation will be performed.

4.4.6 AOI 36-5 (Former UST Farm and Active AST Farm)

This AOI is located immediately south of Building 36 and is associated with a former UST farm and an active contained AST farm. An IM is currently in operation in this location, as described in Section 2.4. To assess the extent of a release associated with cooling, cutting, and process waste oils, two monitoring wells were installed.

In addition, four existing monitoring wells (20-100, 20-102, 20-500, and 37-01) were sampled to provide perimeter dissolved-phase groundwater data. The locations of these monitoring wells are shown on Figures 4-5 and 4-6.

4.4.6.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	2	5	5	5	5	--	--
Groundwater	6	7	7	7	4 + 3 CN/Hg and 1 Mn/Ni	7	7 +1 Mn/Ni
LNAPL	1	1	1	--	--	--	--

4.4.6.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 36-5 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
1,1,1-Trichloroethane	310	IDW (200)
Trichloroethene	44	IDW (5.0)
Vinyl chloride	6.2	IDW (2.0)
Beryllium	6.9	IDW (4.0)
Manganese	3,700	IDW (2,500)
Nickel	170	IDW (100)

4.4.6.3 Conclusions

The RFI soil data from AOI 36-5 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 36-5 indicate that screening criteria were exceeded for several VOCs and inorganic constituents. The physical extent of the exceedances associated with VOCs has been defined; however, the physical extent of the exceedances associated with inorganic constituents has not been defined.

Based on these results, monitoring well RFI-36-14 will be sampled for inorganic constituents during the next round of groundwater sampling. Further action is pending the outcome of the next round of data collection.

The physical extent of LNAPL in this area has been defined. An IM is being developed for this area to address the LNAPL, as discussed in Sections 2.4 and 5.3.

4.4.7 AOI 55-1 (Industrial Wastewater Treatment Facilities)

This AOI is located around the Site's industrial wastewater treatment facilities (Buildings 55, 55A, and 55B) and is associated with process wastewater and waste oil storage facilities, clarifiers, and mixing tanks. To assess the downgradient extent of VOCs previously detected in this area, 11 soil borings and four monitoring wells were installed in this area. Six existing monitoring wells (55-1, 55-2, 55-3, 55-4, 55-5, and 20-120) were also sampled due to previously detected VOC concentrations above screening criteria. The locations of these soil borings and monitoring wells are shown on Figures 4-5 and 4-6.

4.4.7.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	11	24	24	24	24	--	--
Groundwater	10	10	9	9	9 CN/Hg	9	9

4.4.7.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 55-1 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in the groundwater samples from AOI 55-1 that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
1,2-Dichloropropane	130	IDW (5.0)
Benzene	10	IDW (5.0)
Trichloroethene	44	IDW (5.0)
Vinyl chloride	28	IDW (2.0)
bis(2-Chloroethyl)ether	23	IDW (8.3)
Arsenic	58	IDW (50)

4.4.7.3 Conclusions

The RFI soil data from AOI 55-1 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 55-1 indicate screening criteria were exceeded for several VOCs and arsenic. The physical extent of these exceedances has not been defined, due to uncertainties in groundwater flow direction in this area. Based on these results, a more detailed investigation of groundwater flow direction will be implemented. Once a more detailed understanding of groundwater flow direction is obtained, additional follow-up activities may be proposed.

4.4.8 AOI 10-1 (Manufacturing Operations and Several Tanks)

This AOI consists of the overall area of Building 20, including its basement area, manufacturing operations, external areas, and several tanks. LNAPL has historically been detected in this area, and an IM consisting of a groundwater and LNAPL recovery and treatment system is in operation, as described in Section 2.4. To provide additional characterization of this AOI, six soil borings and one monitoring well were installed. Four existing monitoring wells (20-121, 20-144, 20-145, and 43-167) were also sampled. The locations of these soil borings and monitoring wells are shown on Figures 4-5 and 4-6.

4.4.8.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	6	10	10	10	10 + 6 Pb	--	--
Groundwater	5	5	4	4	4 CN/Hg	4	4 + 1Ba

4.4.8.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituents detected in soil samples that exceeded the screening criteria is presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Chromium	750	IPSIC(240)
Lead	2,200	IDC (900)
Manganese	3,000	IPSIC (1,500)

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
1,1,1-Trichloroethane	210	IDW (5.0)
1,1-Dichloroethene	13	IDW (7.0)
Trichloroethene	250	IDW (5.0)
Vinyl chloride	3.2	IDW (2.0)
Barium	28,000	IDW (2,000)

4.4.8.3 Conclusions

The RFI soil data from AOI 10-1 indicated screening criteria were exceeded for chromium, lead, and manganese. The physical extent of these exceedances has been defined; therefore, no additional investigation activities are planned.

The RFI groundwater data from AOI 10-1 indicate that screening criteria were exceeded for several VOCs and barium. The physical extent of exceedances of 1,1,1-trichloroethene, 1,1-dichloroethene, and trichloroethene has been defined. The physical extent of exceedances of vinyl chloride and barium has not been defined. Based on these results, existing monitoring well 20-171 will be sampled for VOCs during the next round of groundwater sampling. In addition, the physical extent of barium exceedances will be evaluated by developing isoconcentration contours and investigating historic manufacturing processes in this area. Further action is pending the outcome of the next round of data collection.

4.4.9 AOI 10-2 (Solid Waste Transfer Area and Former ASTs)

This AOI consists of a solid waste transfer area and former ASTs containing process waste oils and No. 2 fuel oil, and is located east of Building 20 and south of Buildings 22 and 24. To assess potential releases from this area, 3 soil borings and 11 monitoring wells were installed. The locations of these soil borings and monitoring wells are shown on Figures 4-5 and 4-6.

4.4.9.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	11	21	13	13	13 + 1 Mn	--	--
Groundwater	8	8	4	4	1 + 3 CN/Hg	4	4 + 1 Mn

4.4.9.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituents detected in soil samples that exceeded the screening criteria are presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Manganese	1,800	IPSIC (1,500)

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
1,1,1-Trichloroethane	580	IDW (5.0)
1,1-Dichloroethene	110	IDW (7.0)
Benzene	17	IDW (5.0)
Chloroethane	2,600	IDW (1,700)
cis-1,2-Dichloroethene	150	IDW (70)
Methylene chloride	24	IDW (5.0)
Trichloroethene	150	IDW (5.0)
Vinyl chloride	60	IDW (2.0)
Arsenic	68	IDW (50)
Manganese	3,400	IDW (2,500)

4.4.9.3 Conclusions

The RFI soil data from AOI 10-2 indicated that screening criteria were exceeded for manganese. The physical extent of the exceedances has been defined; therefore, no additional investigation activities are planned.

The RFI groundwater data from AOI 10-2 indicate that screening criteria were exceeded for several VOCs and inorganic constituents. The physical extent of the exceedances has been defined; therefore, no additional investigation activities are planned.

4.4.10 AOI 10-3 (Two Process Waste Oil Sumps)

This AOI consists of the basement area of Building 22, including two process waste sumps that collect leaking oil from compressors. Five soil borings and six monitoring wells were installed to assess upgradient and downgradient conditions associated with releases of hydraulic and process waste oils. Existing monitoring well 20-103N was also sampled to provide current analytical data at locations with prior criteria exceedances. The locations of these soil borings and monitoring wells are shown on Figures 4-5 and 4-6.

4.4.10.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	11	17	15	15	15 +15 Mn	--	--
Groundwater	7	7	6	6	5 +1 CN/Hg	6	6

4.4.10.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituents detected in soil samples that exceeded the screening criteria is presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Manganese	2,500	IPSIC(1,500)

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
1,1,1-Trichloroethane	1,800	IDW(200)
1,1-Dichloroethane	5,900	IDW(2,500)
1,1-Dichloroethene	87	IDW(7.0)
Vinyl chloride	280	IDW(2.0)
Beryllium	4.2	IDW(4.0)

4.4.10.3 Conclusions

The RFI soil data from AOI 10-3 indicated that screening criteria were exceeded for manganese. The physical extent of the exceedance has been defined; therefore, no additional investigation activities are planned.

The RFI groundwater data from AOI 10-3 indicate that screening criteria were exceeded for several VOCs and beryllium. The physical extent of these exceedances has not been defined. Based on these results, two monitoring wells (RFI-10-28 and RFI-10-29) will be installed downgradient of this area and sampled for VOCs and inorganics. In addition, the exceedances of several VOCs in monitoring well 20-101R may indicate the potential presence of dense nonaqueous liquid (DNAPL) at this location. Based on these results, a deep well will be installed at this location (20-101RD) to assess the potential presence of DNAPL.

4.4.11 AOI 10-4 (Scrapyard Area)

This AOI consists of the scrapyard area immediately south of Building 20 and was used for scrap material storage, vehicle dismantling, and vehicle equipment storage. LNAPL has historically been detected in this area, as part of the LNAPL area described for AOI 10-1. One new monitoring well was installed to assess downgradient VOCs and TPH associated with process waste, coolings/cutting, transmission, and hydraulic oils. In addition, five existing monitoring wells (20-504, 20-FP6, 20-FP10, 20-FP11, and 30-100) were sampled to provide groundwater quality data at the existing LNAPL plume perimeter. The locations of these soil borings and monitoring wells are shown on Figures 4-5 and 4-6.

4.4.11.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	1	1	1	1	--	--
Groundwater	6	8	6	6	1 +5 CN/Hg	6	6

4.4.11.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 10-4 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Benzene	6.1	IDW(5.0)
Vinyl chloride	2.3	IDW(2.0)

4.4.11.3 Conclusions

The RFI soil data from AOI 10-4 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 10-4 indicate that screening criteria were exceeded for benzene and vinyl chloride. The physical extent of these exceedances has been defined; therefore, no additional investigation activities are planned.

The physical extent of LNAPL in this area has been defined. An IM is being evaluated to address the LNAPL identified in this area (refer to Sections 2.4 and 5.3).

4.4.12 AOI 05-1 (Former Metal Machining Chip Processing)

This AOI consists of the basement area along the southeast portion of Building 43 and is associated with a former metal machining chip processing operation. An IM is currently in operation in this area. Four soil borings and one monitoring well were installed in this area. In addition, three existing monitoring wells (30-120, 43-166, and 43-168) were sampled to provide current groundwater quality data at the LNAPL perimeter. The locations of these soil borings and monitoring wells are shown on Figures 4-7 and 4-8.

4.4.12.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	5	5	5	5	5 +4 Pb/Mn	--	--
Groundwater	4	5	5	5	5 CN/Hg	5	5

4.4.12.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituents detected in soil samples that exceeded the screening criteria is presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Lead	3,100	IDC (900)
Manganese	2,400	IPSIC (1,500)

Groundwater Analytical Results

The concentrations of constituents detected in the monitoring well samples from AOI 05-1 do not exceed the screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.4.12.3 Conclusions

The RFI soil data from AOI 05-1 indicate that screening criteria were exceeded for lead and manganese. The physical extent of this exceedance has been defined; therefore, no additional investigation activities are planned.

The RFI groundwater data from AOI 05-1 indicate that no screening criteria were exceeded. Based on these results, no further groundwater investigation will be performed.

An IM is in operation within this area to address LNAPL, as discussed in Sections 2.4 and 5.3.

4.4.13 AOI 05-2 (Filtration Room, Oil Room, Below-Grade Vault, and Elevator Pit)

This AOI consists of the east-central portion of Building 43 and is associated with a "Filtration Room," "Oil Room," a below-grade vault, and an elevator pit. Two monitoring wells were installed to assess upgradient and downgradient conditions associated with materials handled in this area. In addition, one existing monitoring well (20-140) was sampled. The locations of these monitoring wells are shown on Figures 4-7 and 4-8.

4.4.13.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	2	6	6	3	6	--	--
Groundwater	3	4	4	4	4 CN/Hg	4	4

4.4.13.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 05-2 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Trichloroethene	95	IDW(5.0)
Vinyl chloride	6.0	IDW(2.0)
Beryllium	5.6	IDW(4.0)

4.4.13.3 Conclusions

The RFI soil data from AOI 05-2 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 05-2 indicate screening criteria were exceeded for trichloroethene, vinyl chloride, and beryllium. The physical extent of these exceedances has been defined; therefore, no additional investigation activities are planned.

4.4.14 AOI 05-3 (Building 43 Basement Containing Process Waste Oil Sumps and Drains)

This AOI consists of a basement area in Building 43 beneath transmission component heat treating operations that contains process waste oil sumps and drains. To assess the downgradient extent of VOCs associated with process waste oils, four monitoring wells were installed in this area. In addition, two existing monitoring wells (43-100 and 43-101R) were sampled due to previous criteria exceedances (well 43-101 was reinstalled during this investigation). The locations of these monitoring wells are shown on Figures 4-7 and 4-8.

4.4.14.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	5	11	11	8	11	--	--
Groundwater	6	6	6	6	1 +5 CN/Hg	6	6

4.4.14.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 05-3 do not exceed the applicable screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Trichloroethene	29	IDW(5.0)
Arsenic	84	IDW(50)

4.4.14.3 Conclusions

The RFI soil data from AOI 05-3 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 05-3 indicate screening criteria were exceeded for trichloroethene and arsenic. The physical extent of these exceedances has been defined; therefore, no additional investigation activities are planned.

4.4.15 AOI 05-4 (Metal Forming Operations and Recirculation Trenches and Sumps)

This AOI consists of the "Cold Former Room" and is associated with various metal forming operations and recirculation trenches and sumps. One monitoring well was installed in this area to assess potential releases at this AOI. In addition, one existing monitoring well (43-103) was sampled to provide additional downgradient groundwater quality data. The locations of these monitoring wells are shown on Figures 4-7 and 4-8.

4.4.15.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	3	3	0	3	--	--
Groundwater	2	2	2	2	0	2	2

4.4.15.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 05-4 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the groundwater samples from AOI 05-4 do not exceed the screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.4.15.3 Conclusions

The RFI soil data from AOI 05-4 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 05-4 indicate that no screening criteria were exceeded. Based on these results, no further groundwater investigation will be performed.

4.4.16 AOI 05-5 (Active Process Machinery, Collection Trenches, and Sumps)

This AOI is in the northern portion of Building 43 and consists of active process machinery, collection trenches, and sumps for both "wet" and "dry" operations. An IM was implemented in this area to address a prior release of cutting oil. Three monitoring wells and one soil boring were installed within this AOI. One piezometer was installed to provide upgradient groundwater elevation data at this AOI. In addition, existing monitoring well 43-220 was sampled. The locations of these soil borings, monitoring wells, and piezometers are shown on Figures 4-7 and 4-8.

4.4.16.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	5	16	16	16	16	--	--
Groundwater	3	3	3	3	3 CN/Hg	3	3
NAPL	1	1	1	1	--	--	--

4.4.16.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 05-5 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Arsenic	70	IDW(50)

4.4.16.3 Conclusions

The RFI soil data from AOI 05-5 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 05-5 indicate screening criteria were exceeded. The extent of this exceedance has been defined; therefore, no additional investigation activities are planned.

The detection of LNAPL in monitoring well RFI-05-11 confirms the historical presence of LNAPL in this area. An IM for this area has been operated and is being further evaluated (refer to Sections 2.4 and 5.3).

4.4.17 AOI-05-6 (Active Process Machinery, Collection Trenches, and Sumps)

This AOI is in the southern portion of Building 43 and areas south of Building 43. It consists of active process machinery, collection trenches, and sumps for both "wet" and "dry" operations. Five soil borings, six monitoring wells, and one piezometer were installed in this area. In addition, four existing monitoring wells (30-140, 43-140, 43-141, and 43-242) were sampled. The locations of these soil borings, monitoring wells, and piezometers are shown on Figures 4-7 and 4-8.

4.4.17.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	11	24	24	24	24 + 2Pb	--	--
Groundwater	8	8	7	7	1 +6 CN/Hg	7	7
NAPL	2	2	2	2	--	--	--

4.4.17.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituents detected in soil samples that exceeded the screening criteria is presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Lead	3,500	IDC(900)

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
cis-1,2-Dichloroethene	81	IDW(70)
Trichloroethene	230	IDW(5.0)
Vinyl chloride	19	IDW(2.0)

4.4.17.3 Conclusions

The RFI soil data from AOI 05-6 indicate that screening criteria were exceeded for lead. Several step out locations to define the physical extent of this exceedance could not be installed because the locations were not accessible due to the presence of production equipment. Further sampling to delineate these locations is not practical due to lack of accessibility.

The RFI groundwater data from AOI 05-6 indicate that screening criteria were exceeded for several VOCs. The physical extent of these exceedances has not been defined due to uncertainties in groundwater flow direction in this area. Based on these results, a more detailed investigation of groundwater flow direction will be implemented. Once a more detailed understanding of groundwater flow direction is obtained, additional follow-up activities may be proposed.

4.4.18 AOI 03-1 (Quenching and Cooling Oil Systems)

This AOI consists of the overall area of the Factory 03 building complex, including various quenching and cooling oil systems used for various metal forging, quenching, and cooling operations. Past investigations of this area have indicated impacts to underlying soil and groundwater resulting from releases from associated operations. An IM was implemented in this area, as described in Section 2.4. To assess the presence of residual contamination, four soil borings and four monitoring wells were installed. In addition, seven existing monitoring wells (03-101, 03-109, 13-111, 13-114, 03-02, 70-100, and 70-109) were sampled. The locations of these soil borings and monitoring wells are shown on Figures 4-9 and 4-10.

4.4.18.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	8	10	10	10	10 + 4 Mn	--	--
Groundwater	11	11	11	11	11 CN/Hg	11	11

4.4.18.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituents detected in soil samples that exceeded the screening criteria is presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Manganese	3,500	IPSIC(1,500)

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Trichloroethene	64	IDW(5.0)
Vinyl chloride	9.1	IDW(2.0)
Arsenic	90	IDW(50)
Beryllium	43	IDW(4.0)
Selenium	190	IDW(50)

4.4.18.3 Conclusions

The RFI soil data from AOI 03-1 indicate that screening criteria were exceeded for manganese. The physical extent of this exceedance has not been defined. Based on these results, two soil borings (RFI-03-09 and RFI-03-10) will be installed and sampled for inorganic constituents.

The RFI groundwater data from AOI 03-1 indicate that screening criteria were exceeded for several VOCs and inorganic constituents. The extent of these exceedances has been defined; therefore, no additional investigation activities are planned.

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)

This AOI consists of the basement area beneath the southern and central portions of Building 71B and is associated with three metal machining chip/cooling and cutting oil filtration/processing operations, as well as an inactive hydraulic elevator, several process waste sumps and tanks, a drum storage area, and an active hazardous waste accumulation area. Two soil borings, two monitoring wells, and two soil boring/temporary wells were installed in this area. The locations of these soil borings and monitoring wells are shown on Figures 4-11 and 4-12.

4.4.19.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	5	8	8	8	8 + 2 Pb	--	--
Groundwater	4	4	3	3	1 CN/Hg	3	3

4.4.19.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituents detected in soil samples that exceeded the screening criteria is presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Lead	69,000	IDC(900) IPSIC(44,000)

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Vinyl chloride	12	IDW(2.0)
Arsenic	90	IDW(50)

4.4.19.3 Conclusions

The RFI soil data from AOI 81-1 indicate that screening criteria were exceeded for lead. Several step out locations to define the physical extent of this exceedance could not be sampled due to the presence of concrete. Further sampling to further define these conditions is not practical due to the pervasive subsurface concrete.

The RFI groundwater data from AOI 81-1 indicate that screening criteria were exceeded for vinyl chloride and arsenic. The physical extent of the vinyl chloride exceedance has been defined. The physical extent of the arsenic exceedance has not been defined. Based on these results, existing monitoring well RFI-81-35 will be sampled for inorganic constituents during the next groundwater sampling round. Further action is pending the outcome of the next round of data collection.

4.4.20 AOI 81-2 (Active Metal Welding and Machining and Torque Converter Assembly)

This AOI consists of active metal welding and machining, and torque converter assembly operations performed in Buildings 70, 70B, 71, 72, 73, 73A, 73B, and 74. LNAPL was historically detected in an area to the east of Buildings 73, 73A, and 73B. To assess this AOI, 11 soil borings and five monitoring wells were installed. In

addition, four existing monitoring wells (70-102, 70-160, 70-163, and 70-165) were sampled. The locations of these soil borings and monitoring wells are shown on Figures 4-11 and 4-12.

4.4.20.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	16	21	22	21	21 +1 Cr(VI) and 4 Pb/Mn	--	--
Groundwater	9	9	8	8	2 + 6 CN/Hg	8	6

4.4.20.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituents detected in soil samples that exceeded the screening criteria is presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Chromium (total)	270	IPSIC(240)
Lead	3,100	IDC(900)
Manganese	1,800	IPSIC(1,500)

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Lead	19	IDW(4.0)
Manganese	3,200	IDW(2,500)

4.4.20.3 Conclusions

The RFI soil data from AOI 81-2 indicate that screening criteria were exceeded for chromium, lead, and manganese. A soil sample collected from the location of the chromium exceedance showed hexavalent chromium to be non-detect; therefore, no additional activities for chromium are planned. Several step out locations to define the physical extent of lead and manganese exceedances could not be sampled due to concrete refusal. Two additional step out locations could not be sampled because the locations were not accessible.

Further sampling to further define these conditions is not practical due to pervasive subsurface concrete and/or lack of accessibility.

The RFI groundwater data from AOI 81-2 indicate that screening criteria were exceeded for lead and manganese; however, these exceedances were only slightly above the screening levels. Based on these results, monitoring well 70-163 will be resampled for inorganic constituents during the next round of groundwater sampling. Further action is pending the outcome of the next round of data collection.

4.4.21 AOI 81-3 (Former Foundry Operations, an Elevator Pit, Metal Machining Areas, and a Forklift Battery Charging Area)

This AOI is the basement area of Building 70 and is associated with former foundry operations, an elevator pit along the west side of Building 70A, areas of "wet" metal machining in eastern portions of Building 73, and a forklift battery charging area in the northwest corner of Building 69. To assess potential releases from this area, one soil boring/temporary well and four monitoring wells were installed. In addition, existing monitoring well 86-100 was sampled. The locations of these soil borings and monitoring wells are shown on Figures 4-11 and 4-12.

4.4.21.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	5	15	15	15	15	--	--
Groundwater	6	6	5	5	1 +1 CN/Hg	5	5

4.4.21.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 81-3 do not exceed the applicable screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Trichloroethene	11	IDW(5.0)
Vinyl chloride	6.7	IDW(2.0)
Barium	2,500	IDW(2,000)
Lead	6.7	IDW(4.0)
Manganese	2,600	IDW(2,500)

4.4.21.3 Conclusions

The RFI soil data from AOI 81-3 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 81-3 indicate that screening criteria were exceeded for several VOCs and inorganic constituents. The physical extent of these exceedances has been defined; therefore, no additional investigation activities are planned.

4.4.22 AOI 81-4 (Air Compressor Operations)

This AOI consists of the basement areas of Buildings 69A and 69B and is associated with facility air compressor operations. Past operations in these basements involved the draining of oils from facility air compressor operations. One monitoring well was installed at this AOI to assess potential releases from this AOI. The location of this monitoring well is shown on Figures 4-11 and 4-12.

4.4.22.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	3	3	3	3	--	--
Groundwater	1	2	1	1	1 CN/Hg	1	1

4.4.22.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 81-4 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Tetrachloroethene	11	IDW(5.0)

4.4.22.3 Conclusions

The RFI soil data from AOI 81-4 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 81-4 indicate that screening criteria were exceeded for tetrachloroethene. Resampling results confirmed the presence of tetrachloroethene at this location; however, the physical extent of the exceedance has been defined, and no new soil borings/monitoring wells are warranted. This well will be sampled for VOCs during the next round of groundwater sampling. Further action is pending the outcome of the next round of data collection.

4.4.23 AOI 81-5 (Existing and Former ASTs)

This AOI consists of a containment area for several existing and former ASTs which contain(ed) diesel fuel and automatic transmission fluid. One soil boring/temporary well was installed at this AOI to assess potential releases from this AOI. The location of this soil boring is shown on Figures 4-13 and 4-14.

4.4.23.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	3	3	3	3	--	--
Groundwater	1	1	1	1	0	1	1

4.4.23.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 81-5 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the groundwater sample from AOI 81-5 do not exceed the screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.4.23.3 Conclusions

The RFI soil data from AOI 81-5 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI soil and groundwater data from AOI 81-5 indicate that no screening criteria were exceeded. Based on these results, no further groundwater investigation will be performed.

4.4.24 AOI 21-1 (Former Metal Chip Briquetting Operations and Current Metal Welding and Tool Grinding Operations)

This AOI is the overall area of Building 21 and the area immediately southeast of Building 21 and is associated with former metal chip briquetting operations and current metal welding/tool grinding operations. Three soil boring/temporary wells and one monitoring well were installed to assess the extent of constituents associated with cooling/cutting oils. The locations of these soil borings and monitoring wells are shown on Figures 4-13 and 4-14.

4.4.24.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	4	9	9	9	9	--	--
Groundwater	4	4	4	4	1	4	4

4.4.24.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 21-1 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Trichloroethene	12	IDW(5.0)
Vinyl chloride	3.2	IDW(2.0)
Pentachlorophenol	2.1	IDW(1.0)
Manganese	9,200	IDW(2,500)

4.4.24.3 Conclusions

The RFI soil data from AOI 21-1 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 21-1 indicate that screening criteria were exceeded for trichloroethene, vinyl chloride, pentachlorophenol, and manganese. The physical extent of these exceedances has been defined; therefore, no additional investigation activities are planned.

4.4.25 AOI 65-1 (Air Compressor Station and a Main Process Waste Pump Station)

This AOI consists of the overall area of Building 65 and is associated with a facility air compressor station and a main process waste pump station for the Site's industrial wastewater treatment system. One monitoring well was installed to assess potential releases in this area. The location of this monitoring well is shown on Figures 4-15 and 4-16.

4.4.25.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	2	2	2	2	--	--
Groundwater	1	1	1	1	1 CN/Hg	1	1

4.4.25.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 65-1 do not exceed the applicable screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Trichloroethene	42	IDW(5.0)

4.4.25.3 Conclusions

The RFI soil data from AOI 65-1 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 65-1 indicate that screening criteria were exceeded for trichloroethene. The physical extent of this exceedance has been defined; therefore, no additional investigation activities are planned.

4.4.26 AOI 83/84-1 (Former and Existing Machining Operations)

This AOI consists of areas of various former and existing machining operations in Buildings 11 (both "wet" and "dry" operations). Two soil borings and one monitoring well were installed to assess potential releases in this area. The locations of these soil borings are shown on Figures 4-15 and 4-16.

4.4.26.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	2	8	8	4	8	--	--
Groundwater	2	2	2	2	2 CN/Hg	2	2

4.4.26.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 83/84-1 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the groundwater samples from AOI 83/84-1 do not exceed the screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.4.26.3 Conclusions

The RFI soil data from AOI 83/84-1 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 83/84-1 indicate that no screening criteria were exceeded. Based on these results, no further groundwater investigation will be performed.

4.4.27 AOI 83/84-2 (Former and Existing Machining Operations)

This AOI consists of areas of various former and existing machining operations in Building 32 (including two basements) (both "wet" and "dry" operations). A prior release within this AOI has been documented. In addition, LNAPL was detected in monitoring wells installed in this AOI. To assess this area, eleven soil borings and three monitoring wells were installed. The locations of these soil borings and monitoring wells are shown on Figures 4-15 and 4-16.

4.4.27.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	14	31	31	28	31 +5 Pb	--	--
Groundwater	3	3	3	3	1 + 2 CN/Hg	3	3
LNAPL	1	1	1	1	--	--	--

4.4.27.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituents detected in soil samples that exceeded the screening criteria is presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Benzo(a)pyrene	66	IDC(10)
Chromium	270	IPSIC (240)
Lead	6,500	IDC(900)
Manganese	3,500	IPSIC(1,500)

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
cis-1,2-Dichloroethene	75	IDW(70)
Vinyl chloride	69	IDW(2.0)
Arsenic	100	IDW(50)
Beryllium	23	IDW(4.0)

4.4.27.3 Conclusions

The RFI soil data from AOI 83/84-2 indicate that screening criteria were exceeded for benzo(a)pyrene and several inorganic constituents. The physical extent of the benzo(a)pyrene exceedance has been defined. The physical extent of the exceedances of inorganic constituents has not been defined. Based on these results, four soil borings (RFI-83/84-30 through -33) will be installed and sampled for inorganic constituents.

The RFI groundwater data from AOI 83/84-2 indicate that screening criteria were exceeded for several VOCs and inorganic constituents. The physical extent of these exceedances has been defined; therefore, no additional investigation activities are planned.

The physical extent of LNAPL in this area has been defined. An IM is being developed to address the LNAPL identified in this AOI (refer to Sections 2.4 and 5.3).

4.4.28 AOI 83/84-3 (Former and Existing Machining Operations)

This AOI consists of areas of various former and existing machining operations in Buildings 66A/66D (both "wet" and "dry" operations). Three soil borings, one soil boring/temporary well, and one monitoring well were installed to assess potential exceedances from this area. In addition, existing monitoring well 11-140 was sampled to provide additional upgradient groundwater quality data. The locations of these soil borings and monitoring wells are shown on Figures 4-15 and 4-16.

4.4.28.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	4	2	2	2	2 +6 Pb	--	--
Groundwater	3	3	3	3	2 CN/Hg	3	3

4.4.28.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituents detected in soil samples that exceeded the screening criteria is presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Lead	42,000	IDC(900)

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Beryllium	11	IDW(4.0)
Lead	20	IDW(4.0)

4.4.28.3 Conclusions

The RFI soil data from AOI 83/84-3 indicate that screening criteria were exceeded for lead. The physical extent of this exceedance has not been defined. Based on these results, four soil borings (RFI-83/84-34 through -37) will be installed and sampled for inorganic constituents.

The RFI groundwater data from AOI 83/84-3 indicate that screening criteria were exceeded for beryllium and lead. The physical extent of these exceedances has been defined; therefore, no additional investigation activities are planned.

4.4.29 AOI 83/84-4 (Former Machining Operations and an Inactive Rail Loading Area)

This AOI consists for former "wet" metal machining operations in the central portion of Building 66, including three process oil collection/recirculation sumps, and an inactive rail loading area (including associated sumps along the north side of Building 66C). One soil boring and two monitoring wells were installed to assess potential exceedances in this area. The locations of these soil borings and monitoring wells are shown on Figures 4-15 and 4-16.

4.4.29.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	3	6	6	6	6	--	--
Groundwater	1	1	1	1	--	1	1
LNAPL	1	1	1	1	1	--	--

4.4.29.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 83/84-4 do not exceed the applicable screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Arsenic	100	IDW(50)

4.4.29.3 Conclusions

The RFI soil data from AOI 83/84-4 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 83/84-4 indicate that screening criteria were exceeded for arsenic. The physical extent of this exceedance has been defined; therefore, no additional investigation activities are planned.

NAPL was detected during installation of monitoring well RFI-83/84-07. An IM is being evaluated to address the LNAPL identified in this AOI (refer to Sections 2.4 and 5.3). Further investigations related to defining the physical extent of LNAPL are in progress.

4.4.30 AOI 83/84-5 (Former Process Trenches and Pits, and an Inactive Heat Treating Tunnel)

This AOI consists of various inactive or former process trenches and pits and an inactive heat treating tunnel located in Building 66. One soil boring/temporary well was installed to assess potential releases in this area. In

addition, existing monitoring well 11-120 was sampled to provide additional upgradient groundwater quality data. The locations of the soil boring and monitoring well are shown on Figures 4-15 and 4-16.

4.4.30.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	2	2	2	2	--	--
Groundwater	2	3	3	3	2 CN/Hg	3	3

4.4.30.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 83/84-5 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the groundwater samples from AOI 83/84-5 do not exceed the screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.4.30.3 Conclusions

The RFI soil data from AOI 83/84-5 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 83/84-5 indicate that no screening criteria were exceeded. Based on these results, no further groundwater investigation will be performed.

4.4.31 AOI 83/84-6 (Forklift Battery Charging Area and Associated Trench and Pit, and a Drum Storage Area

This AOI consists of a forklift battery charging area and an associated trench and pit in the central portion of Building 83A and a drum storage area in the southern portion of Building 83 used for metal working fluids and corrosion inhibitors. One soil boring was installed to assess potential exceedances in this area. The location of this soil boring is shown on Figures 4-15 and 4-16.

4.4.31.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	4	4	--	4	--	--
Groundwater	--	--	--	--	--	--	--

4.4.31.2 Results

The concentrations of constituents detected in soil were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 83/84-6 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

4.4.31.3 Conclusions

The RFI soil data from AOI 83/84-6 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

4.4.32 AOI 83/84-7 (Underground Storage Tanks)

This AOI consists of Tanks 50 through 58 identified on the 1973 Site Drawing and Tanks 88-1 through 88-4, and 88-11 identified on the 1991 Site Drawing. A prior release(s) from these tanks has been documented. One monitoring well was installed to assess the extent of the prior release. In addition, existing monitoring wells 88-2, 88-7, 88-8, and 88-9 were sampled. The locations of these monitoring wells are shown on Figures 4-15 and 4-16.

4.4.32.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	2	2	2	2	--	--
Groundwater	5	5	5	5	5 CN/Hg	5	5

4.4.32.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 83/84-7 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Benzene	40	IDW(5.0)
cis-1,2-Dichloroethene	88	IDW(70)
Trichloroethene	35	IDW(5.0)
Vinyl chloride	150	IDW(2.0)

4.4.32.3 Conclusions

The RFI soil data from AOI 83/84-7 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 83/84-7 indicate that screening criteria were exceeded for several VOCs. The physical extent of these exceedances has been defined; therefore, no additional investigation activities are planned.

4.4.33 AOI 85-1 (Elevator Pit and Engine Test Area)

This AOI consists of an elevator pit along the north-central side of Building 85 and is associated with trenches and a basement vault area related to the engine test area in the eastern portion of the building. Six monitoring wells were installed to assess potential releases in this area. The locations of these monitoring wells are shown on Figures 4-13 and 4-14.

4.4.33.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	6	20	20	20	20	--	--
Groundwater	6	7	7	7	2 +4 CN/Hg	7	7
LNAPL	1	1	1	1	1	--	--

4.4.33.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 85-1 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Tetrachloroethene	22	IDW(5.0)
Trichloroethene	36	IDW(5.0)
Beryllium	7.0	IDW(4.0)
Selenium	80	IDW(50)
Vanadium	130	IDW(62)

4.4.33.3 Conclusions

The RFI soil data from AOI 85-1 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 85-1 indicate that screening criteria were exceeded for several VOCs and inorganic constituents. The physical extent of these exceedances has been defined; therefore, no additional investigation activities are planned.

LNAPL was detected in soil boring RFI-85-02, and the physical extent of the LNAPL has not been defined. Based on these results, one monitoring well (RFI-85-08) will be installed to investigate the potential source of LNAPL in this area. Further action is pending the outcome of the next round of data collection.

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)

This AOI is the overall area of Building 86 and areas immediately southeast and west of Building 86, collectively associated with a hazardous waste drum accumulation area, a process waste pump station, a waste transport vehicle storage area, and a former UST farm. An IM has formerly been in operation in this area to

address a free product release from the former UST farm, as described in Section 2.4. Four soil borings, two soil boring/temporary wells, and nine monitoring wells were installed in this area to assess the extent of constituents associated with gasoline, process waste oils, and other oils. In addition, four existing monitoring wells (86-3, 87-FP2, 87-FP3, and 87-FP5) were sampled due to historical criteria exceedances. The locations of these soil borings and monitoring wells are shown on Figures 4-13 and 4-14.

4.4.34.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	15	27	27	27	27+ 1 Mn and 6 As	--	--
Groundwater	14	17	16	16	3+10 CN/Hg	16	16

4.4.34.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituents detected in soil samples that exceeded the screening criteria is presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Arsenic	110	IDC(61)
Manganese	3,200	IPSIC(1,500)

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
1,1-Dichloroethene	27	IDW(7.0)
1,2-Dichloroethane	5.4	IDW(5.0)
Benzene	7.9	IDW(5.0)
Chloroethane	14,000	IDW(1,700)
cis-1,2-Dichloroethene	450	IDW(70)
Methylene chloride	9.3	IDW(5.0)
Tetrachloroethene	41	IDW(5.0)
Trichloroethene	2,000	IDW(5.0)
Vinyl chloride	280	IDW(2.0)
Beryllium	9.8	IDW(4.0)

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Lead	10	IDW(4.0)
Manganese	2,800	IDW(2,500)

4.4.34.3 Conclusions

The RFI soil data from AOI 86-1 indicate that screening criteria were exceeded for arsenic and manganese. The physical extent of these exceedances has been defined; therefore, no additional investigation activities are planned.

The RFI groundwater data from AOI 86-1 indicate that screening criteria were exceeded for several VOCs and inorganic constituents. The physical extent of the exceedances of inorganic constituents has been defined. The physical extent of the exceedances of VOCs has not been completely defined. Based on these results, monitoring well RFI-86-14 will be sampled for VOCs during the next groundwater sampling event. Further action is pending the outcome of the next round of data collection.

4.4.35 AOI 07-1 (Former Coal Yard)

This AOI consists of a former coal yard immediately north of Building 07 and several other process facilities along the north side of Building 07. One soil boring, two soil boring/temporary wells, and two monitoring wells were installed in this area to assess potential releases. In addition, existing monitoring well 07-02 was sampled to provide upgradient groundwater quality data. The locations of these soil borings and monitoring wells are shown on Figures 4-13 and 4-14.

4.4.35.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	5	8	8	8	8	--	--
Groundwater	4	4	4	4	2 CN/Hg	4	4

4.4.35.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 07-1 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Vinyl chloride	3.3	IDW(2.0)

4.4.35.3 Conclusions

The RFI soil data from AOI 07-1 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 07-1 indicate that screening criteria were exceeded for vinyl chloride. The physical extent of this exceedance has not been completely defined, because monitoring well RFI-07-01 was dry. Based on these results, monitoring well RFI-07-01 will be reinstalled, and a groundwater sample will be collected. Further action is pending the outcome of the results of this sample.

4.4.36 AOI 07-2 (Inactive Lime "Slaker House" and Inactive Lime Slurry Tank)

This AOI consists of an inactive lime "Slaker House" and adjacent inactive lime slurry tank adjacent to the southwest corner of Building 07. One soil boring was installed to assess the extent of constituents associated with caustics and/or other materials in this area. The location of this soil boring is shown on Figures 4-13 and 4-14.

4.4.36.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	4	4	4	4	--	--
Groundwater	--	--	--	--	--	--	--

4.4.36.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 07-2 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

4.4.36.3 Conclusions

The RFI soil data from AOI 07-2 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

4.4.37 AOI 07-3 (Two Elevator Pits and a bulk Acid AST)

This AOI consists of two elevator pits in the north-central and south-central portions of Building 07 and a bulk acid AST in the southeast corner of Building 07. Two soil boring/temporary wells and one monitoring well were installed in this area to assess potential releases. In addition, existing monitoring well 07-01 was sampled to provide upgradient groundwater quality data. The locations of these soil borings and monitoring wells are shown on Figures 4-13 and 4-14.

4.4.37.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	3	8	8	8	8	--	--
Groundwater	3	5	5	5	2 +1 CN/Hg	5	5

4.4.37.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 07-3 do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Beryllium	16	IDW(4.0)

4.4.37.3 Conclusions

The RFI soil data from AOI 07-3 indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 07-3 indicate screening criteria were exceeded for beryllium. The physical extent of this exceedance has been defined; therefore, no additional investigation activities are planned.

4.5 AOIs South of Leith Street

Results of investigations of 37 AOIs south of Leith Street are detailed below.

4.5.1 AOI Group 94-A (Sumps and Trenches in Oil Change Pits and Chemical Storage Areas)

This AOI Group is associated with Building 94 and relates to sumps and trenches in oil change pits and chemical storage areas. One soil boring/temporary well was installed to assess potential releases from this area. The location of this soil boring is shown on Figures 4-17 and 4-18.

4.5.1.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	2	2	2	2	--	--
Groundwater	1	1	1	1	--	1	1

4.5.1.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 94-A do not exceed the applicable screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituent that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Di-n-butylphthalate	13	GSI (9.7)

4.5.1.3 Conclusions

The RFI soil data from AOI 94-A indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 94-A indicate that screening criteria were exceeded for di-n-butylphthalate. The physical extent of this exceedance has not been defined. Based on these results, a new monitoring well (RFI-94-07) will be installed in this area (closer to the Flint River) and sampled during the next round of groundwater sampling. Further action is pending the outcome of the next round of data collection.

4.5.2 AOI Group 94-B (Process Sump and Trench)

This AOI group is associated with Building 94 and relates to a sump in the "South Lube Pit" and a trench that discharged to the process wastewater system. One soil boring was installed in this area to assess potential releases from this area. Due to access issues related to building demolition activities in this area, a groundwater sample has not yet been collected. The location of this soil boring is shown on Figures 4-17 and 4-18.

4.5.2.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	3	3	3	3	--	--
Groundwater	--	--	--	--	--	--	--

4.5.2.2 Results

The concentrations of constituents detected in soil were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 94-B do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

4.5.2.3 Conclusions

The RFI soil data from AOI 94-B indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

A groundwater sample from AOI 94-B has not yet been collected due to access issues related to building demolition activities. The final determination of potential exceedances for this area will be completed when access to the area is possible (anticipated late 2002 or early 2003.

4.5.3 AOI Group 94-C (Hydraulic Oil Storage Areas)

This AOI is associated with Building 94 and relates to sumps, trenches, and hydraulic lift cylinders in hydraulic oil storage areas. Two soil borings/temporary wells were installed to assess potential releases from this area. The locations of these soil borings are shown on Figures 4-17 and 4-18.

4.5.3.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	2	5	5	5	5	--	--
Groundwater	2	2	2	2	--	2	2

4.5.3.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 94-C do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituent that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Arsenic	52 J	IDW (50)

4.5.3.3 Conclusions

The RFI soil data from AOI 94-C indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 94-C indicate that screening criteria were exceeded for arsenic. The concentration of arsenic was an estimated value near the screening criteria, and the downgradient extent has been defined through neighboring samples. Based on these results, no additional investigations are planned.

4.5.4 AOI Group 94-D (Pit For a Cable-Operated Car Elevator)

This AOI is associated with Building 94A and relates to a pit for a cable-operated car elevator. One monitoring well was installed to assess potential releases from this area. Due to access issues related to building demolition activities in this area, a groundwater sample has not yet been collected. The location of this monitoring well is shown on Figures 4-17 and 4-18.

4.5.4.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	4	4	4	4	--	--
Groundwater	--	--	--	--	--	--	--

4.5.4.2 Results

The concentrations of constituents detected in soil were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 94-D do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

4.5.4.3 Conclusions

The RFI soil data from AOI 94-D indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

A groundwater sample from AOI 94-D has not yet been collected due to access issues related to building demolition activities. Final determination of potential exceedances from this area will be completed when access to the area becomes possible (anticipated late 2002 or early 2003).

4.5.5 AOI Group 94-E (Car-Loading Machinery and Hydraulic Oil Observed on Floor)

This AOI Group is associated with Building 03 and relates to a car-loading device and hydraulic oil on the floor. One soil boring/temporary well was installed to assess potential releases from this area. The location of this soil boring is shown on Figures 4-17 and 4-18.

4.5.5.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	3	3	3	3	--	--
Groundwater	1	1	1	1	--	1	1

4.5.5.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 94-E do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 94-E groundwater sample do not exceeded screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.5.5.3 Conclusions

The RFI soil data from AOI 94-E indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI soil and groundwater data from AOI 94-E indicate that no screening criteria were exceeded. Based on these results, no further groundwater investigation will be performed.

4.5.6 AOI Group 84-A (Elevator Pits, Sumps, a Machine Shop, Hydraulic Cylinders, and a Hydraulic Lift)

This AOI Group is associated with Buildings 84 and 23 and relates to pits for cable-operated elevators, sumps, a machine shop area, hydraulic cylinders, and a hydraulic lift. Two soil boring/temporary wells and one monitoring well were installed to assess potential releases from this area. Due to access issues related to

building demolition activities in this area, a groundwater sample from RFI-84-06 has not yet been collected. The locations of these soil borings and monitoring wells is shown on Figures 4-17 and 4-18.

4.5.6.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	3	7	7	7	7	--	--
Groundwater	2	2	2	2	--	2	2

4.5.6.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 84-A do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 84-A grab groundwater samples do not exceed screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.5.6.3 Conclusions

The RFI soil data from AOI 84-A indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

A groundwater sample from AOI 84-06 has not yet been collected due to access issues related to building demolition activities. A final determination of potential exceedances from this area will be completed when access to the area is possible (anticipated late 2002 or early 2003).

4.5.7 AOI Group 84-B (Sumps, Floor Drains, a Pit, a Flooded Basement, and a Below Grade Vault)

This AOI Group is associated with Building 84 and relates to sumps, floor drains, a pit, a basement flooded with water, and a below grade vault. One soil boring/temporary well was installed to assess potential releases from this area. The location of this soil boring is shown on Figures 4-17 and 4-18.

4.5.7.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	3	3	3	3	--	--
Groundwater	1	2	2	2	--	2	2

4.5.7.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 84-B do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 84-B groundwater sample do not exceed screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.5.7.3 Conclusions

The RFI soil data from AOI 84-B indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI soil and groundwater data from AOI 84-B indicate that no screening criteria were exceeded. Based on these results, no further groundwater investigation will be performed.

4.5.8 AOI Group 84-C (Sumps, a Trench, and an Oil/Water Separator Pit)

This AOI Group is associated with Building 84 and relates to sumps, a trench, and an oil/water separator pit near a car wash. One soil boring/temporary well was installed to assess potential releases from this area. The location of this soil boring is shown on Figures 4-17 and 4-18.

4.5.8.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	3	3	3	3	--	--
Groundwater	1	1	1	1	--	1	1

4.5.8.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 84-C do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 84-C groundwater sample do not exceed screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.5.8.3 Conclusions

The RFI soil data from AOI 84-C indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 84-C indicate that no screening criteria were exceeded. Based on these results, no further groundwater investigation will be performed.

4.5.9 AOI Group 84-D (Former UST Farm, an AST Farm, and Drum Storage Area)

This AOI Group is associated with Building 84 and relate to a former UST farm immediately north of Building 84; a recessed AST farm located north of the UST farm; and a drum storage area. A prior release from this area has been documented. An IM has historically operated in this area to address the prior release, as described in Section 2.4. One monitoring well was installed to assess potential residual extent of the prior release. In addition, two existing monitoring wells (84-2 and 84-6) were sampled. The locations of these monitoring wells are shown on Figures 4-17 and 4-18.

4.5.9.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	2	2	2	2	--	--
Groundwater	3	4	4	4	4 CN/Hg	4	4

4.5.9.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 84-D do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Vinyl Chloride	2.1	IDW (2.0)
Chromium	450	IDW (100)
Nickel	910	IDW (100)

4.5.9.3 Conclusions

The RFI soil data from AOI 84-D indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 84-D indicate that screening criteria were exceeded for vinyl chloride, chromium, and nickel. The physical extent of these exceedances has been defined; therefore, no additional investigation activities are planned.

4.5.10 AOI Group 17-A (Elevator Pit)

This AOI group is associated with Building 17 and relates to a pit for a cable-operated elevator. One soil boring/temporary well was installed to assess potential releases from this area. In addition, a monitoring well was installed in this area to assess regional groundwater characteristics at this AOI Group. The location of these soil borings and monitoring wells are shown on Figures 4-17 and 4-18.

4.5.10.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	2	4	4	4	4	--	--
Groundwater	2	2	2	2	1 CN/Hg	2	2

4.5.10.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 17-A do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Selenium	11	GSI (5.0)
Silver	0.45	GSI (0.20)

4.5.10.3 Conclusions

The RFI soil data from AOI 17-A indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 17-A indicate that screening criteria were exceeded for selenium and silver. Based on these results, well RFI-17-02 will be resampled for inorganic constituents during the next round of groundwater sampling. Further action is pending the outcome of the next round of data collection.

4.5.11 AOI Group 02-A (Process Wastewater Sump)

This AOI group is associated with Building 02 and relates to a sump for a process wastewater station. One soil boring/temporary well was installed to assess potential releases from this area. The location of this soil boring is shown on Figures 4-19 and 4-20.

4.5.11.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	2	2	2	2	--	--
Groundwater	1	1	1	1	--	1	1

4.5.11.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 02-A do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 02-A groundwater sample do not exceed screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.5.11.3 Conclusions

The RFI soil data from AOI 02-A indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 02-A indicate that no screening criteria were exceeded. Based on these results, no further groundwater investigation will be performed.

4.5.12 AOI Group 02-B (Elevator Pit)

This AOI group is associated with Building 02 and relates to a pit for an elevator. One soil boring/temporary well was installed to assess potential releases from this area. The location of this soil boring is shown on Figures 4-19 and 4-20.

4.5.12.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group (including duplicate samples) are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	2	2	2	2	--	--
Groundwater	1	2	2	2	--	2	2

4.5.12.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 02-B do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituent that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Manganese	3,000	IDW (2,500)

4.5.12.3 Conclusions

The RFI soil data from AOI 02-B indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 02-B indicate that the screening criteria for manganese were exceeded. The physical extent of this exceedance has not been defined. Based on these results, a new monitoring well (RFI-02-09) will be installed downgradient of this AOI and sampled for inorganic constituents.

4.5.13 AOI Group 02-C (Sump In The Materials Laboratory)

This AOI group is associated with Building 02 and relates to a sump in the Materials Laboratory. One soil boring/temporary well and three soil borings were installed to assess potential exceedances from this area. The location of these soil borings are shown on Figures 4-19 and 4-20.

4.5.13.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	4	2	2	2	2 + 3 Pb	--	--
Groundwater	1	1	1	1	--	1	1

4.5.13.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituent that exceeded the screening criteria is presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Chromium	390	IPSIC (240)
Lead	2,000	IDC (900)

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 02-A groundwater sample do not exceed screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.5.13.3 Conclusions

The RFI soil data from AOI 02-A indicate that screening criteria were exceeded for chromium and lead. The physical extent of these releases has been defined; therefore, no additional investigation activities are planned.

The RFI groundwater data for AOI 02-A indicate that no screening criteria were exceeded. Based on these results, no further groundwater investigation will be performed.

4.5.14 AOI Group 02-D (Press Machine Pit)

This AOI group is associated with Building 02 and relates to a pit for a large press machine. One soil boring/temporary well was installed to assess potential exceedances from this area. The location of this soil boring is shown on Figure 4-19 and 4-20.

4.5.14.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	3	3	3	3	--	--
Groundwater	1	1	1	1	--	1	1

4.5.14.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 02-D do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 02-D groundwater sample do not exceed screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.5.14.3 Conclusions

The RFI soil data from AOI 02-D indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 02-D indicate that no screening criteria were exceeded. Based on these results, no further groundwater investigation will be performed.

4.5.15 AOI Group 02-E (Former UST)

This AOI group is associated with Building 02 and relates to a former UST. One soil boring/temporary well was installed to assess potential releases from this area. The location of this soil boring is shown on Figures 4-19 and 4-20.

4.5.15.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group (including duplicate samples) are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	2	2	2	2	--	--
Groundwater	1	2	2	2	--	2	2

4.5.15.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 02-E do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 02-E groundwater sample do not exceed screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.5.15.3 Conclusions

The RFI soil data from AOI 02-E indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 02-E indicate that no screening criteria were exceeded. Based on these results, no further groundwater investigation will be performed.

4.5.16 AOI Group 02-F (Hydraulic Oil AST and Pump)

This AOI group is associated with Building 02 and relates to a hydraulic oil AST and a pump used for the operation of the "Hydraulic Anchor Pac Area." One soil boring and one monitoring well were installed to assess potential releases from this area. The locations of these soil borings and monitoring wells are shown on Figures 4-19 and 4-20.

4.5.16.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	2	9	9	9	9	--	--
Groundwater	1	1	1	1	1	1	1

4.5.16.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 02-F do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituent that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Manganese	3,700	IDW (2,500)

4.5.16.3 Conclusions

The RFI soil data from AOI 02-F indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 02-F indicate that screening criteria were exceeded for manganese. The physical extent of this exceedance has not been defined. Based on these results, a new well (RFI-02-10) will be installed approximately 150 feet to the southeast of this AOI and sampled for inorganic constituents. Further action is pending the outcome of the next round of data collection.

4.5.17 AOI Group 23-A (Process Waste Sumps, Dock Levelers, and Basements Used for Heat Treat Process Water)

This AOI group is associated with Building 23 and relates to sumps discharging to the process waste system, dock levelers, and basements used for treatment of water used in the heat treat process. Two monitoring wells were installed to assess potential releases from this area. The locations of these monitoring wells are shown on Figures 4-19 and 4-20.

4.5.17.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	2	3	3	3	3	--	--
Groundwater	2	2	2	2	2 CN/Hg	2	2

4.5.17.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 23-A do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 23-A groundwater sample do not exceed screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.5.17.3 Conclusions

The RFI soil data from AOI 23-A indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 23-A indicate that no screening criteria were exceeded. Based on these results, no further groundwater investigation will be performed.

4.5.18 AOI Group 29-A (Elevator Pit and Observed Oil Staining)

This AOI group is associated with Building 29 and relates to a pit for a cable-operated elevator and former work pads with oil staining. One soil boring/temporary well and two soil borings were installed to assess potential releases in this area. The location of these soil borings are shown on Figures 4-19 and 4-20.

4.5.18.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	3	2	2	2	2 + 2 Pb	--	--
Groundwater	1	1	1	1	--	1	1

4.5.18.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituent that exceeded the screening criteria is presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Lead	1,500	IDC (900)

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 29-A groundwater sample do not exceed screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.5.18.3 Conclusions

The RFI soil data from AOI 29-A indicate that screening criteria were exceeded for lead. The physical extent of this exceedance has been defined; therefore, no additional investigation activities are planned.

The RFI groundwater data from AOI 29-A indicate that no screening criteria were exceeded. Based on these results, no further groundwater investigation will be performed.

4.5.19 AOI Group 12-A (Press Pits, Sumps, Trenches, Traps, and Floor Staining)

This AOI group is associated with Building 12 and relates to several press pits and associated sumps, pits, trenches, traps, and floor staining. Four soil borings, six soil boring/temporary wells, and two monitoring wells were installed to assess potential releases from this area. In addition, a grab sample of groundwater infiltrating into the basement area was collected, and existing monitoring well 04-121 was sampled to provide upgradient groundwater quality. The locations of these soil borings and monitoring wells are shown on Figures 4-19 and 4-20.

4.5.19.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	12	25	25	25	25 +10 Pb	--	--
Groundwater	9	10	10	10	1 + 4 CN/Hg	10	10

4.5.19.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituent that exceeded the screening criteria is presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Lead	11,000	IDC (900)

Groundwater Analytical Results

A summary of the constituents that exceeded the MDEQ Part 201 Industrial Criteria are presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Tetrachloroethene	5.7	IDW(5.0)
Vinyl Chloride	40	IDW (2.0)
Lead	7.9	IDW (4.0)

4.5.19.3 Conclusions

The RFI soil data from AOI 12-A indicate that screening criteria were exceeded for lead. The physical extent of this exceedance has been defined; therefore, no additional investigation activities are planned.

The RFI groundwater data from AOI 12-A indicate screening criteria were exceeded for tetrachloroethene, vinyl chloride, and lead. The physical extent of these exceedances has not been defined due to uncertainties in groundwater flow direction in this area. A more detailed investigation of groundwater flow direction will be implemented once ongoing demolition activities allow access to the area (anticipated late 2002). Once a more detailed understanding of groundwater flow direction is obtained, additional follow-up activities may be proposed.

4.5.20 AOI Group 12-B (Truck Loading Dock Drain and Sump)

This AOI group is associated with Building 12 and relates to a drain within a truck loading dock, and leading to a sump that discharged to the process wastewater system. One soil boring, two soil boring/temporary wells, and three monitoring wells were installed to assess potential exceedances from this area. The locations of these soil borings and monitoring wells are shown on Figures 4-19 and 4-20.

4.5.20.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	3	5	5	5	5	--	--
Groundwater	2	2	2	2	1 CN/Hg	2	2

4.5.20.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituent that exceeded the screening criteria is presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Manganese	1,900	IPSIC (1,500)

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 12-B groundwater sample do not exceed screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.5.20.3 Conclusions

The RFI soil data from AOI 12-B indicate that screening criteria were exceeded for manganese. The physical extent of this exceedance has been defined; therefore, no additional investigation activities are planned.

The RFI groundwater data from AOI 12-B indicate that no screening criteria were exceeded. Based on these results, no further groundwater investigation will be performed.

LNAPL was detected in several soil borings and monitoring wells in this AOI. The physical extent of LNAPL in this area has not been defined. To complete delineation of the LNAPL in this area, one monitoring well will be installed downgradient of the locations where LNAPL was detected. This activity will be completed following demolition activities in this area.

4.5.21 AOI Group 12-C (Sump In Battery Charging Area, Deep Steam Pipe, and a Utility Pit Containing Oil and Water)

This AOI group is associated with Building 12 and relates to a sump that collected runoff from a battery charging area, a deep steam pipe, and an old utility pit with oil and water present. One soil boring/temporary well was installed to assess potential releases from this area. The location of this soil boring is shown on Figures 4-19 and 4-20.

4.5.21.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	2	2	2	2	--	--
Groundwater	1	1	1	1	--	1	1

4.5.21.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 12-C do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituent that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Vanadium	76	IDW (62)

4.5.21.3 Conclusions

The RFI soil data from AOI 12-C indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 12-C indicate that screening criteria were exceeded for vanadium. The physical extent of this exceedance has been defined; therefore, no additional investigation activities are planned.

4.5.22 AOI Group 12-D (Abandoned, Flooded Utility Tunnel)

This AOI group is associated with Building 12 and relates to an abandoned, flooded utility tunnel running north from east of Building 12, under Division Street, to the former powerhouse area. One soil boring/temporary well was installed to assess potential releases from this area. The location of this soil boring is shown on Figures 4-19 and 4-20.

4.5.22.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	2	2	2	2	--	--
Groundwater	1	1	1	1	--	1	1

4.5.22.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 12-D do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 12-D groundwater sample do not exceed screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.5.22.3 Conclusions

The RFI soil data from AOI 12-D indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 12-D indicate that no screening criteria were exceeded. Based on these results, no further activities are planned.

4.5.23 AOI Group 04-A (Process Waste Room and Waste Pit)

This AOI group is associated with Building 04 and relates to the "Process Waste Room" and the "Foam Depressor Process Waste Pit 3," both of which discharged to the process wastewater system. One soil boring/temporary well was installed to assess potential releases from this area. The location of this soil boring is shown on Figures 4-21 and 4-22.

4.5.23.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	2	2	2	2	--	--
Groundwater	1	1	1	1	--	1	1

4.5.23.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 04-A do not exceed screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
cis-1,2-Dichloroethene	130	IDW (70)
Trichloroethene	59	IDW (5.0)

4.5.23.3 Conclusions

The RFI soil data from AOI 04-A indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 04-A indicate screening criteria were exceeded for cis-1,2-dichloroethene and trichloroethene. The physical extent of these exceedances has been defined; therefore, no additional investigation activities are planned.

4.5.24 AOI Group 04-B (Elevator Pits)

This AOI group is associated with Building 04 and relates to a pit for a passenger elevator and two pits for freight elevators. Two soil boring/temporary wells were installed to assess potential releases from this area. The location of these soil borings are shown on Figures 4-21 and 4-22.

4.5.24.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	2	6	6	6	6	--	--
Groundwater	2	2	2	2	--	2	2

4.5.24.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 04-B do not exceed screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 04-B groundwater sample do not exceed screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.5.24.3 Conclusions

The RFI soil data from AOI 04-B indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 04-B indicate that no screening criteria were exceeded. Based on these results, no further activities are planned.

4.5.25 AOI Group 04-C (Elevator Pit)

This AOI group is associated with Building 04 and relates to a pit for a cable-operated elevator. One soil boring/temporary well was installed to assess potential releases from this area. The location of this soil boring is shown on Figures 4-19 and 4-20.

4.5.25.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	4	4	4	4	--	--
Groundwater	1	1	1	1	--	1	1

4.5.25.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 04-C do not exceed screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 04-C groundwater sample do not exceed screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.5.25.3 Conclusions

The RFI soil data from AOI 04-C indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 04-C indicate that no screening criteria were exceeded. Based on these results, no further activities are planned.

4.5.26 AOI Group 04-D (Former USTs)

This AOI group is associated with Building 04 and relates to former USTs located immediately south of Building 04. An IM was implemented in this area to address a release of oil, as described in Section 2.4. No additional soil borings or monitoring wells were installed in this area; however, five existing downgradient monitoring wells (04-1, 04-2, 04-3, 04-4, and 04-5) were sampled. The locations of these monitoring wells are shown on Figures 4-21 and 4-22.

4.5.26.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	0	0	0	0	0	--	--
Groundwater	5	6	6	6	5 CN/Hg	5	5

4.5.26.2 Results

The concentrations of constituents detected in groundwater were compared with the screening criteria as discussed in Section 4.1.

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 04-D groundwater sample do not exceed screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.5.26.3 Conclusions

The RFI groundwater data from AOI 04-D indicate that no screening criteria were exceeded. Based on these results, no further activities are planned.

4.5.27 AOI Group 16-A (Vehicle Fill-Up Station, Automatic Transmission Pump House, and a Gas Pump Station)

This AOI group is associated with Building 16 and relates to a deep pit that collected fluid runoff of cars in a vehicle fill-up station, an automatic transmission pump house containing a gravity floor drain, and a gas pump station for cars in the finishing stage. One monitoring well was installed to assess potential releases from this area. The location of this monitoring well is shown on Figures 4-21 and 4-22.

4.5.27.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	3	3	3	3	--	--
Groundwater	1	1	1	1	1 CN/Hg	1	1

4.5.27.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 16-A do not exceed screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 16-A groundwater sample do not exceed screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.5.27.3 Conclusions

The RFI soil data from AOI 16-A indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 16-A indicate that no screening criteria were exceeded. Based on these results, no further activities are planned.

4.5.28 AOI Group 16-B (Elevator Pit)

This AOI group is associated with Building 16 and relates to pit for a hydraulic elevator. One soil boring/temporary well was installed to assess potential releases from this area. The location of this soil boring is shown on Figures 4-19 and 4-20.

4.5.28.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	3	3	3	3	--	--
Groundwater	1	1	1	1	--	1	1

4.5.28.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 16-B do not exceed screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 16-B groundwater sample do not exceed applicable screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.5.28.3 Conclusions

The RFI soil data from AOI 16-B indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 16-B indicate no screening criteria were exceeded. Based on these results, no further activities are planned.

4.5.29 AOI Group 16-C (Hydraulic Motor, Former AST, and Former USTs)

This AOI group is associated with Building 16 and relates to a hydraulic motor with external AST that was used for hydraulic lift to a Dumpster and former USTs located along the side of Building 16. Two soil boring/temporary wells and one monitoring were initially installed in this area. Following these initial investigation activities, a confirmed release notice was submitted, detailing a release from USTs 113, 114, and

115. Subsequently, several additional soil borings, delineation borings, and monitoring wells were installed in this area. The locations of these soil borings and monitoring wells are shown on Figures 4-21 and 4-22.

4.5.29.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	11	25	25	25	25	--	--
Groundwater	8	9	9	9	1 + 5 CN/Hg	9	9

A grab sample was collected from the water contained in the basement of building 16 and is include with the groundwater.

4.5.29.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituent that exceeded the screening criteria are presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Vinyl Chloride	0.16	ISVIA (0.15)

Groundwater Analytical Results

A summary of the constituents that exceeded the MDEQ Part 201 Industrial Criteria are presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Benzene	18	IDW (5.0)
Trichloroethene	5.1	IDW (5.0)
Beryllium	44	IDW (4.0)
Lead	100	IDW (4.0)
Selenium	180	IDW (50)

4.5.29.3 Conclusions

The RFI soil data from AOI 16-C indicate that screening criteria were exceeded for vinyl chloride. The screening criteria exceedance was related to volatilization from soil to indoor air. The soil sample with the exceedance was collected at a relatively deep depth interval, and a soil sample collected at a shallower depth

interval at this location had a non-detected concentration of vinyl chloride. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 16-C indicate that screening criteria were exceeded for several VOCs and inorganic constituents. The physical extent of these exceedances has been defined; however, the monitoring wells where these exceedances were noted will be resampled for VOCs and inorganic constituents during the next round of groundwater sampling.

LNAPL was detected in this AOI during investigation activities. This LNAPL was determined to be associated with several USTs identified in this area. A confirmed release was documented for these USTs, and their removal is being conducted under Parts 211 and 213 of Michigan Public Act 451.

4.5.30 AOI Group 16-D (Former UST and Process Wastewater Sump)

This AOI group is associated with Building 16 and relates to a former UST and a sump that discharged to the process wastewater system. One soil boring/temporary well was installed to assess potential exceedances from this area. The location of this soil boring is shown on Figures 4-19 and 4-20.

4.5.30.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	3	3	3	3	--	--
Groundwater	1	1	1	1	1	--	--

4.5.30.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 16-D do not exceed screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 16-D groundwater sample do not exceed screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.5.30.3 Conclusions

The RFI soil data from AOI 16-D indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 16-D indicate that no screening criteria were exceeded. Based on these results, no further activities are planned.

4.5.31 AOI Group 40-A (Former UST Farm)

This AOI group is associated with Building 40 and relates to a former UST farm located between Buildings 02 and 40. A prior release from this area has been documented. One soil boring/temporary well was installed to further assess the downgradient extent of residual contamination in this area. In addition, seven existing monitoring wells (40-1, 40-2, 40-3, 40-4, 40-5, 40-6, and 40-7) were to be sampled to provide current groundwater quality data. Following installation of replacement wells for two of the existing monitoring well locations evidence of LNAPL was noted. Subsequently, several additional soil borings, delineation borings, and monitoring wells were installed in this area. The location of these soil borings and monitoring wells are shown on Figures 4-19, 4-20, 4-21, and 4-22.

4.5.31.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	8	25	25	25	25	--	--
Groundwater	8	8	8	8	1 +6 CN/Hg	8	8

4.5.31.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 40-A do not exceed screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Benzene	1,900	IDW (5.0)
Ethylbenzene	800	IDW (700)
Arsenic	410	IDW (50)
Beryllium	19	IDW (4.0)
Cyanide	440	IDW (200)

4.5.31.3 Conclusions

The RFI soil data from AOI 40-A indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 40-A indicate that screening criteria were exceeded for several VOCs and inorganic constituents. The physical extent of the exceedances has been defined; however, monitoring well 40-6 will be sampled for amenable cyanide (for risk evaluation purposes) during the next round of groundwater sampling.

LNAPL was detected during investigation activities in this area. The physical extent of LNAPL has not been defined. Based on these results, one monitoring well (40-1R) will be installed to replace existing monitoring well 40-1 (well was dry) to help define the up/cross-gradient extent of LNAPL. Installation of this well will be completed pending demolition activities in this area.

4.5.32 AOI Group 40-B (Elevator Pit)

This AOI group is associated with Building 40 and relates to a pit for an elevator. One soil boring and one monitoring well was installed to assess potential releases from this area. The locations of the soil boring and monitoring well are shown on Figures 4-19 and 4-20.

4.5.32.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	2	4	4	4	4	--	--
Groundwater	1	1	1	1	1 CN/Hg	1	1

4.5.32.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 40-B do not exceed screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Trichloroethene	18	IDW (5.0)

4.5.32.3 Conclusions

The RFI soil data from AOI 40-B indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 40-B indicate screening criteria were exceeded for trichloroethene. The physical extent of this exceedance has not been defined. Based on these results, one monitoring well (RFI-40-11) will be installed downgradient of this area and sampled for VOCs. Further action is pending the outcome of the next round of data collection.

4.5.33 AOI Group 40-C (Elevator Pit)

This AOI group is associated with Building 40 and relates to a pit for a cable-operated elevator. One soil boring/temporary well was installed to assess potential releases from this area. The location of this soil boring is shown on Figures 4-21 and 4-22.

4.5.33.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	1	3	3	3	3	--	--
Groundwater	1	1	1	1	1	--	--

4.5.33.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 40-C do not exceed screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the AOI 40-C groundwater sample that exceeded the screening criteria are presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Trichloroethene	52	IDW (5.0)
Beryllium	18	IDW(4.0)

4.5.33.3 Conclusions

The RFI soil data from AOI 40-C indicate that no screening criteria were exceeded. Based on these results, no further activities are planned.

The RFI groundwater data from AOI 40-C indicate that screening criteria were exceeded for trichloroethene and beryllium. The physical extent of these exceedances has not been defined. Based on these results, one monitoring well (RFI-40-11) will be installed downgradient of this area and sampled for VOCs. Further action is pending the outcome of the next round of data collection.

4.5.34 AOI Group 40-D (Flooded Basement/Tunnel Area)

This AOI group is associated with Building 40 and relates to a basement/tunnel area flooded with water. A grab sample was collected from the groundwater within the basement/tunnel. One monitoring well was installed to assess potential exceedances from this area. In addition, four existing monitoring wells (40-301, 40-302, 40-304, and 40-305) were sampled, and one existing monitoring well (40-303) was reinstalled and sampled. The locations of these monitoring wells are shown on Figures 4-21 and 4-22.

4.5.34.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	2	6	6	6	6	--	--
Groundwater	7	7	6	6	1 + 4 CN/Hg	6	6

4.5.34.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 40-D do not exceed screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Vinyl chloride	5.8	IDW (2.0)
Lead	6.6	IDW (4.0)

4.5.34.3 Conclusions

The RFI soil data from AOI 40-D indicate that no screening criteria were exceeded. Based on these results, no further activities are planned.

The RFI groundwater data from AOI 40-D indicate that screening criteria were exceeded for vinyl chloride and lead; however, the concentrations of these constituents were only slightly above the screening criteria. Based on these results, monitoring well RFI-40-04 will be resampled for VOCs and inorganic constituents during the next round of groundwater sampling. Further action is pending the outcome of the next round of data collection.

4.5.35 AOI Group 44-A (Sumps, Pits, Trenches, Drains, Floor Stains, and ASTs)

This AOI group is associated with Buildings 44, 04, and 08 and relates to several sumps, pits, trenches, drains, stains, ASTs, and other observed areas. Three soil boring, three soil boring/temporary wells, and three monitoring wells were installed to assess potential releases from this area. In addition, three existing monitoring wells (04-120, 04-140, and 04-160) were sampled to provide current groundwater quality data. During the investigations, monitoring well RFI-44-06 was found to be dry. The locations of these soil borings and monitoring wells are shown on Figures 4-21 and 4-22.

4.5.35.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	8	18	18	18	18 + 3 Mn	--	--
Groundwater	8	8	8	8	4 CN/Hg	8	8

4.5.35.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituent that exceeded the screening criteria is presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Manganese	5,000	IPSIC (1,500)

Groundwater Analytical Results

A summary of the constituents that exceeded the MDEQ Part 201 Industrial Criteria are presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Benzo(a)anthracene	14	IDW (8.5) GCC (9.4)
Benzo(a)pyrene	15	IDW (5.0) GCC (5.0)
Benzo(b)fluoranthene	16	IDW (2.0) GCC (2.0)
Benzo(g,h,i)perylene	7.9	IDW (5.0) GCC (5.0)
Benzo(k)fluoranthene	14	IDW (5.0) GCC (5.0)
Chrysene	16	IDW (5.0) GCC (5.0)
Indeno(1,2,3-cd)pyrene	7.9	IDW (5.0) GCC (5.0)
Total PCBs	1.1	IDW (0.50)
Selenium	52	IDW (50)

4.5.35.3 Conclusions

The RFI soil data from AOI 44-A indicate that screening criteria were exceeded for manganese. Several step out locations to define the physical extent of this exceedance could not be sampled due to the presence of concrete in those specific depth intervals. Further sampling to further define those conditions is not practical due to the pervasive subsurface concrete.

The RFI groundwater data from AOI 44-A indicate that screening criteria were exceeded for several PAHs, total PCBs, and selenium. The physical extent of the exceedances for total PCBs and selenium has been defined. The physical extent of the exceedances of PAHs was to be investigated by sampling groundwater from monitoring well RFI-44-06; however, this well was dry. Based on these results, monitoring well RFI-44-06 will be reinstalled and sampled for SVOCs during the next round of groundwater sampling. Further action is pending the outcome of the next round of data collection.

4.5.36 AOI Group 09-A (Former USTs, Floor Trenches, and Former AST)

This AOI group is related to a floor trench/UST that discharged to the process wastewater system, floor trenches over a holding tank in the "vehicle wash area," a concrete containment for a former AST, and a former UST. Ten soil borings, two soil boring/temporary wells, and two monitoring wells were installed to assess potential screening criteria exceedances in this area. The locations of these soil borings and monitoring wells are shown on Figures 4-23 and 4-24.

4.5.36.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	14	11	13	12	7 + 1Ba, 5 Pb, and 9 Mn	--	--
Groundwater	4	5	5	5	2	5	5

4.5.36.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

A summary of the constituents detected in soil samples that exceeded the screening criteria is presented below. A summary of soil analytical data is presented in Appendix C.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (mg/kg)	Screening Criteria Exceeded (concentration)
Benzo(a)pyrene	57	IDC (10)
Dibenzo(a,h)anthracene	11	IDC (10)
Lead	120,000	IDC (900) IPSIC (44,000)
Manganese	8,300	IPSIC (1,500)

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Trichloroethene	9.3	IDW (5.0)
Vinyl chloride	3.8	IDW (2.0)
Lead	26	IDW (4.0)

4.5.36.3 Conclusions

The RFI soil and groundwater data from AOI 09-A indicate that screening criteria were exceeded. The physical extent of exceedances of PAHs has been defined; however, the physical extent of the exceedances of lead, manganese, and VOCs have not been defined. Based on these results, the following additional activities are planned:

- Three shallow soil borings (RFI-09-33 through -35) will be installed to delineate the manganese exceedance;
- Four shallow soil borings (RFI-09-36 through -39) will be installed to delineate the lead exceedance;
- Monitoring wells RFI-09-32 and MW-25 will be sampled for VOCs and inorganic constituents during the next round of groundwater sampling; and
- Monitoring well MW-26 will be sampled for VOCs during the next round of groundwater sampling.

Further action is pending the outcome of the next round of data collection.

4.5.37 AOI Group 09-B (Hamilton Avenue Tank Farm)

This AOI Group is associated with the Former Building 31/Hamilton Avenue Tank Farm. Four soil borings, one soil boring/temporary well, and nine monitoring wells were installed to assess potential screening criteria exceedances in this area. In addition, six existing monitoring wells (31-5, 31-6, 31-8, MW-22, MW-23, and MW-24) were sampled. The locations of these soil borings and monitoring wells are shown on Figures 4-23 and 4-24.

4.5.37.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	14	25	19	22	18 + 6Ba and 6Pb	--	--
Groundwater	15	16	11	11	3 + 6 CN/Hg	11	11 + 2Ba and 2Pb

4.5.37.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from AOI 09-B do not exceed the applicable screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Benzene	930	IDW (5.0)
Total PCBs	1.7	IDW (0.5)
Antimony	6.8	IDW (6.0)
Arsenic	61	IDW (50)
Lead	5.8	IDW (4.0)
Selenium	52	IDW (50)

4.5.37.3 Conclusions

The RFI soil data from AOI 09-B indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from AOI 09-B indicate that screening criteria were exceeded for benzene, total PCBs, and several inorganic constituents. The physical extent of these exceedances has not been defined. Based on these results, one monitoring well (RFI-09-41) will be installed to assess the physical extent of the screening criteria exceedances. In addition, existing monitoring wells MW-22, MW-23, and MW-24 will be sampled for inorganic constituents during the next round of groundwater sampling. Further action is pending the outcome of the next round of data collection.

The physical extent of LNAPL detected in monitoring well 31-7 has not been defined. Based on these results, one monitoring well (RFI-09-40) will be installed to define the downgradient extent of LNAPL detected in this area.

4.6 New AOIs

This section describes additional areas not associated with previously described AOIs. These areas (the Former Aeration Lagoons Area, the Harriet Street Area, Administration Building Area, and Former Building 94 Employee Parking Lot Area) were initially investigated for the purpose of potential property transfers. Subsequent investigations in these areas were conducted under this RFI.

4.6.1 Former Aeration Lagoons Area

This AOI consists of the former Aeration Lagoons and the vacant area immediately south of the former Aeration Lagoons. Nine soil borings and three soil boring/temporary wells were installed to assess potential releases in this area. In addition, four existing monitoring wells (GM-1, GM-4, GM-11, and GM-12) were sampled. The locations of these soil borings and monitoring wells are shown on Figures 4-25 and 4-26.

4.6.1.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	12	6	6	35	6	--	--
Groundwater	8	8	8	4	--	4	8

4.6.1.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from the former Aeration Lagoons Area do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the groundwater samples from the former Aeration Lagoons Area do not exceed the screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.6.1.3 Conclusions

The RFI soil data from the former Aeration Lagoons Area indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from the former Aeration Lagoons Area indicate that no screening criteria were exceeded. Based on these results, no further groundwater investigation will be performed.

4.6.2 Harriet Street Area (USTs)

This AOI consists of a 2.3-acre fenced, vacant lot at the southwestern corner of Harriet Street and Industrial Avenue. As part of an investigation related to potential property transfer, several USTs were discovered on the property. The activities associated with the investigation and removal of the USTs are described in a document

entitled *Underground Storage Tank Closure Report - Harriet Street Property* (BBL, December 2001). Thirteen soil borings, two soil boring/temporary wells, and two monitoring wells were installed to assess potential releases from this area. The locations of these soil borings and monitoring wells are shown on Figures 4-27 and 4-28.

4.6.2.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	17	16	12	39	7	--	--
Groundwater	4	5	5	--	--	--	3

4.6.2.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from the Harriet Street Property area do not exceed screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Benzene	44	IDW(5.0)

4.6.2.3 Conclusions

The RFI soil data for the Harriet Street Property Area indicate that no screening criteria were exceeded. Based on these results, no further soil investigation will be performed.

The RFI groundwater data from the Harriet Street Property Area indicate that screening criteria were exceeded for benzene; however, activities related to this exceedance have been conducted as part of the UST removals in the closure report described above. Based on these results, no further groundwater investigation will be performed.

4.6.3 Former Administration Building Area (Transformer Yard, Soil Stockpile Area, and Former USTs)

This area consists of the former Administration Building (Building 01), employee parking lot and immediate surroundings. During a review of the property for potential property transfer, three potential areas of concern (PAOC) were identified. PAOC 1 was identified as a transformer yard. PAOC 2 was identified on the basis of a currently disturbed area of soil and historical VOC detections from a soil stockpile; the soil was excavated during underground utility installation activities. Additionally, there is an underground tunnel that connected a gasoline pump on the Administration Building property to the Hamilton Avenue Tank Farm. PAOC 3 was identified because of the presence of a former filling station with two gasoline tanks. Because of the potential presence of the two gasoline tanks at PAOC 3, a geophysical survey was completed in November 2001. The geophysical survey identified an anomaly that may be the two underground storage tanks. A test pitting program was implemented to determine the source of the geophysical anomaly and USTs were not found. One soil boring and two soil boring/temporary wells were installed in this area. The locations of these soil borings and monitoring wells are shown on Figures 4-27 and 4-28.

4.6.3.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	3	9	9	9	9	--	--
Groundwater	2	2	2	2	2	2	2

4.6.3.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from the Administration Building Area do not exceed the screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

A summary of the constituents detected in groundwater samples that exceeded the screening criteria is presented below. A summary of groundwater analytical data is presented in Appendix D.

Constituent Detected Above Screening Criteria	Maximum Concentration Detected (µg/L)	Screening Criteria Exceeded (concentration)
Benzene	7.8	IDW(5.0)

4.6.3.3 Conclusions

The RFI soil and groundwater data from the Administration Building Area indicate that screening criteria were exceeded for benzene. This exceedance is thought to be related to the Hamilton Avenue Tank Farm Area (AOI 09-B). Additional investigation activities will be completed to address AOI-09B (refer to Section 4.5.37). Based on these results, no further investigation will be performed for the remainder of the Administration Area.

4.6.4 Former Building 94 Employee Parking Lot

This AOI consists of the former Building 94 Employee Parking Lot. One soil boring and two soil boring/temporary wells were installed to assess potential releases in this area. In addition, existing monitoring well 94-100 was sampled. The locations of these soil borings and monitoring wells are shown on Figures 4-17 and 4-18.

4.6.4.1 Scope

The number of locations from which samples were collected for each medium and the number of samples analyzed for each analyte group are as follows:

Media	Locations	VOCs	SVOCs	Total PCBs	Total Inorganics	Dissolved PCBs	Dissolved Inorganics
Soil	2	8	8	4	8	--	--
Groundwater	2	2	2	2	2 CN/Hg	2	2

4.6.4.2 Results

The concentrations of constituents detected in soil and groundwater were compared with the screening criteria as discussed in Section 4.1.

Soil Analytical Results

The concentrations of constituents detected in the soil samples from the former Building 94 Employee Parking Lot Area do not exceed the applicable screening criteria; however, PCBs were detected at one location at concentrations exceeding residential screening criteria. A summary of soil analytical data is presented in Appendix C.

Groundwater Analytical Results

The concentrations of constituents detected in the groundwater samples from the former Building 94 Employee Parking Lot Area do not exceed the applicable screening criteria. A summary of groundwater analytical data is presented in Appendix D.

4.6.4.3 Conclusions

The RFI soil and groundwater data from the former Building 94 Employee Parking Lot area indicate that no release exceeding the screening criteria has occurred; however, two additional soil borings (BD 94 EP-02C and BD 94 EP-02D) will be installed and sampled for PCBs to delineate the residential criteria exceedance of PCBs. Further action is pending the outcome of the next round of data collection.

5. Project Status

5.1 AOI Investigation Status Summary

Table 5-1 presents a summary of the RFI activities completed to investigate each AOI, and the analytical data collected. Table 5-1 also indicates whether additional investigation activities are proposed to determine the nature and extent of identified constituents at each AOI. Based on the current understanding of Site conditions, sufficient data have been collected to characterize subsurface conditions at 46 of the 78 AOIs. At the remaining locations additional data are to be collected, as described in Section 4.

5.1.1 AOIs Requiring No Further Investigation

Among the AOIs investigated during the Phase I RFI, the following were found to require No Further Investigation. This determination is based on a conservative approach in which the highest concentration of each constituent at an AOI was compared with, and did not exceed, generic MDEQ screening criteria for any constituent in soil or groundwater:

Factory 36 Area
- AOI 36-4

Factory 05 Area
- AOI 05-4

Factory 81 Area
- AOI 81-5

Factory 83/84 Area
- AOI 83/84-1
- AOI 83/84-5
- AOI 83/84-6

Building 07 Area
- AOI 07-2

Buildings 03, 17, 28, 84 and 94 Area
- AOI 94-E
- AOI 84-B
- AOI 84-C

Buildings 02, 12, 23 and 29 Area
- AOI 02-A
- AOI 02-D
- AOI 02-E
- AOI 23-A
- AOI 12-D

Buildings 04, 08, 16, 40 and 44 Area

- AOI 04-B
- AOI 04-C
- AOI 04-D
- AOI 16-A
- AOI 16-B
- AOI 16-D

Aeration Lagoons Area

- AOI WL

Building 01 Area

- ACSP

5.1.2 AOIs Requiring No Further Investigation of Soil

At the following AOIs, no further investigation is required for soil; however, additional investigation and/or evaluation is required for groundwater. This determination is based on a conservative approach in which the highest concentration of each constituent at an AOI was compared with generic MDEQ screening criteria. Based on this comparison, soil criteria exceedances were identified.

Building 38 Area

- AOI 38-1

Factory 36 Area

- AOI 36-2
- AOI 36-3
- AOI 36-5

Buildings 55, 55A and 55B Areas

- AOI 55-1

Factory 10 Area

- AOI 10-4

Factory 05 Area

- AOI 05-2
- AOI 05-3
- AOI 05-5

Factory 81 Area

- AOI 83-3
- AOI 83-4

Buildings 21 and 97 Area

- AOI 21-1

Building 65 Area
- AOI 65-1

Factory 83/84 Area
- AOI 83/84-4
- AOI 83/84-7

Buildings 15, 61, 61A, and 85 Area
- AOI 85-1

Building 07 Area
- AOI 07-1
- AOI 07-3

Buildings 03, 17, 28, 84 and 94 Area
- AOI 94-A
- AOI 94-B
- AOI 94-C
- AOI 94-D soil
- AOI 84-A
- AOI 84-D
- AOI 17-A

Buildings 02, 12, 23 and 29 Area
- AOI 02-B
- AOI 02-F
- AOI 12-C

Buildings 04, 08, 16, 40 and 44 Area
- AOI 04-A
- AOI 16-C
- AOI 40-A
- AOI 40-B
- AOI 40-C
- AOI 40-D

Building 09 Area
- AOI 09-B

Building 01 Area
- AOI BD01

5.1.3 AOIs Requiring No Further Investigation of Groundwater

At the following AOIs, no further investigation is required for groundwater; however, additional investigation and/or evaluation is required for soil. This determination is based on a conservative approach in which the

highest concentration of each constituent at an AOI was compared with generic MDEQ screening criteria. Based on this comparison, groundwater criteria exceedances were identified.

Due to the potential for the intermingling of impacted groundwater from multiple AOIs, groundwater quality was also looked at on a sitewide basis, as described in Section 5.2.

Factory 05 Area

- AOI 05-1

Buildings 02, 12, 23 and 29 Area

- AOI 02-C
- AOI 29-A
- AOI 12-B

Building 94 Employee Parking Lot Area

- AOI BD94 NFA

5.1.4 AOIs Requiring Risk Evaluation

At the AOIs requiring further investigation of soil and/or groundwater, and at other AOIs where monitored constituents were detected in soil and groundwater at concentrations above generic MDEQ screening criteria, an evaluation of risk will be completed. These AOIs are listed on Table 5-1. Using the RFI characterization data, a risk evaluation, which may include an evaluation of cumulative risk and baseline risk assessment, will be performed for these AOIs. The risk evaluation will be completed to determine if the release poses a potential threat to human health and the environment and to evaluate whether corrective action is required.

5.2 Background Soil Data

The Site is located in an area of Flint that is used for a mixture of industrial, commercial, and residential purposes. Three borings, RFI-05-09, RFI-36-01, and RFI-55-01, were installed as part of the RFI along the upgradient site perimeter and could be representative of background soil quality. The soil data were compared to the generic screening criteria, and no concentrations above criteria were identified. Additional background soil analytical data is scheduled to be collected during the next site drilling mobilization.

5.3 Sitewide Groundwater Quality

Due to the number and location of the Site AOIs, upgradient groundwater quality and the distribution of select constituents have been looked at on a sitewide basis.

5.3.1 Upgradient Groundwater Quality

A series of historical and new monitoring wells are located along the upgradient site perimeter. Upgradient monitoring wells include 04-121, 04-140, 11-140, 36-120, 36-121, 43-141, and RFI-55-01. The groundwater

data for these wells were compared to the generic screening criteria, and no concentrations above criteria were identified.

Information regarding the former Pro-Met property was obtained from the MDEQ through a Freedom of Information Act (FOIA) Request. This property is located on the north side of Stewart Avenue, apparently upgradient of the Site's industrial wastewater treatment plant. Plating operations were conducted at the former Pro-Met property beginning in 1958. Investigations completed by MDEQ in 1995 showed soil concentrations of total chromium, hexavalent chromium, nickel, lead, barium, cadmium, cyanide, copper, mercury, and zinc above the Generic MDEQ Screening Criteria for the Protection of Groundwater (ABB Environmental Services, Inc., 1997). Groundwater data collected in 1995 showed concentrations of trichloroethene (maximum of 1,100 µg/L), 1,2-dichloropropane (maximum of 120 µg/L), benzene (maximum of 7.3 µg/L), and bis(2-chloroethyl)ether (maximum of 28 µg/L) at concentrations above the Generic MDEQ Criteria for Industrial Drinking Water (ABB Environmental Services, Inc., 1997).

Trichloroethene (44 µg/L), 1,2-dichloropropane (130 µg/L), and bis(2-chloroethyl)ether (23.2µg/L) were detected above the Generic MDEQ Industrial Drinking Water Criteria at monitoring well 55-1, located at the GM NAO Flint Operations Site. Monitoring well 55-1 is the site well located closest to the former Pro-Met property, and may be impacted by releases from offsite. Additional groundwater elevation data are needed in this area of the site to refine our understanding of the groundwater flow direction. Data collection is scheduled for summer 2002.

5.3.2 Sitewide Distribution of Constituents in Groundwater at Concentrations Above Generic Screening Criteria

The distribution of constituents detected in groundwater at concentrations above generic MDEQ criteria are presented on Figures 5-1 and 5-2 for the Northend and Southend of the Site, respectively. These figures provide an overview of the areas with VOC, SVOC, metal, and PCB groundwater impacts. Also, these figures illustrate the estimated extent of LNAPL. The distribution of VOCs and SVOCs in groundwater is shown by blue shading; dissolved phase metals are shown by green shading (or hatching); and PCBs are shown by yellow shading (one location on the Southend). The estimated extent of LNAPL is shown by orange shading.

Isoconcentration maps of select chlorinated VOCs were also prepared for the Northend and Southend of the Site to further illustrate the distribution of these constituents in groundwater at concentrations above IDW criteria (Figures 5-3 and 5-4). The chlorinated compounds selected for illustration include trichloroethene, cis-1,2-dichloroethene, 1,1,1 trichloroethane, vinyl chloride, and tetrachloroethene. The isoconcentration lines for these compounds along with the associated generic MDEQ IDW criteria for each compound are shown.

Trichloroethene was identified in several areas in the Northend at concentrations ranging from approximately 5 to 500 micrograms per liter (µg/L) and cis-1,2-dichloroethene was identified in several areas in the Northend with concentrations ranging from approximately 70 to 200 µg/L. In the Northend, 1,1,1 trichloroethane was identified in four areas with concentrations ranging from 10 to 1,000 µg/L. Vinyl chloride was identified at concentrations ranging from approximately 2 to 100 µg/L and tetrachloroethene was identified in two areas with concentrations ranging from about 5 to 100 µg/L.

In the Southend, trichloroethene was identified in three areas with concentrations ranging from about 5 to 40 µg/L, and cis-1,2-dichloroethene was identified in one area with concentrations ranging from approximately 70 to 100 µg/L. 1,1,1 Trichloroethane was not identified above IDW criteria; however, vinyl chloride was

identified in three areas with concentrations ranging from about 2 to 5 µg/L. Tetrachloroethene was not identified in the Southend at concentrations above IDW criteria.

Two additional isoconcentration maps for the Northend and Southend were prepared to illustrate the distribution of benzene in groundwater (Figures 5-5 and 5-6), respectively. Benzene is present above screening criteria in the Northend of the Site in six areas with concentrations ranging from about 5 to 5,000 µg/L. Of the commonly associated compounds toluene, ethylbenzene and xylene, only toluene was detected at concentrations above health-based IDW criteria in the Northend of the Site. Toluene was detected above the IDW criteria at only two locations, as shown on Figure 5-5. Ethylbenzene and xylene were not detected above the health-based IDW criteria at any Northend location. In the Southend, benzene was identified in five areas with concentrations ranging from 5 to 1,000 µg/L. Toluene, ethylbenzene, and xylene were not detected at concentrations above the health-based IDW criteria at any Southend location.

These figures have been used to facilitate an understanding of the extent of groundwater impacts and the relationship between source chlorinated compounds and degradation products. Additional groundwater sampling data, scheduled for collection in 2002, will provide temporal data regarding plume mobility.

5.4 Interim Measures Status Summary

The IM program, which primarily focuses on the recovery of LNAPL, includes the elements described below.

- Continued operation and evaluation of the effectiveness of the following four existing IMs currently operating:

  - Former Tank Farm 37 Product Recovery System;
  - Factory 10 Groundwater Recovery and Treatment System;
  - Factory 05 Product Recovery Trench; and
  - Factory 81 Area Product Recovery Trench.

- Planned installation of IMs near the southeast corner of the Factory 36 Area and at the Factory 10 Scrapyard Area.

- Continued investigation and data analysis at the following areas to determine the need for IMs to address LNAPL recovery:

  - Building 12;
  - Factory 83/84;
  - Building 16/40; and
  - Former Hamilton Avenue Tank Farm.

6. References

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Tables

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

TABLE 2-1

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

SOIL BORING INVENTORY AND COMPLETION SUMMARY

Boring ID	Associated AOI	Completion Date	Ground Surface Elevation	Boring Total Depth (feet)
ACSP-B1	ACSP	10/26/2000	734.50	16
ACSP-B2	ACSP	10/26/2000	739.40	18
ACSP-B2C	ACSP	5/8/2001	---	20
ACSP-B2D	ACSP	8/7/2001	---	29
ACSP-B2DE	ACSP	8/20/2001	---	26
ACSP-B3	ACSP	10/26/2001	735.20	18
ACSP-B3D	ACSP	8/7/2001	---	16
ACSP-B4	ACSP	10/26/2001	73.8.9	16
ACSP-B5	ACSP	10/26/2001	733.00	14
ACSP-B6	ACSP	10/27/2001	735.60	18
BD01-02	BD01	11/30/2001	---	18
RFI-02-01*	02-A	5/9/2001	738.77	12
RFI-02-02*	02-B	5/9/2001	738.87	16
RFI-02-03*	02-C	5/9/2001	738.97	14
RFI-02-04*	02-D	5/10/2001	739.26	12
RFI-02-06	02-F	5/11/2001	738.87	6.6
RFI-02-09	02-C	9/7/2001	738.71	4
RFI-02-10	02-C	9/7/2001	738.79	3.5
RFI-02-11	02-C	9/7/2001	738.88	4
RFI-03-05	3-1	11/29/2001	747.45	2.5
RFI-03-06	3-1	11/29/2001	746.28	2.5
RFI-03-07	3-1	11/29/2001	746.19	3
RFI-03-08	3-1	11/29/2001	747.86	2.5
RFI-04-01*	04-A	6/4/2001	738.48	17
RFI-04-02*	04-B	6/4/2001	739.73	18
RFI-04-03*	04-B	6/1/2001	740.23	19
RFI-04-04*	04-C	6/1/2001	742.72	17
RFI-05-09 Geotech	05-6	8/2/2001	752.03	18
RFI-05-15	05-2	9/8/2001	754.51	12
RFI-05-16	05-6	9/8/2001	754.45	16
RFI-05-17	05-6	9/8/2001	754.34	16
RFI-05-18	05-6	9/8/2001	754.38	14
RFI-05-22	05-1	11/26/2001	748.87	6
RFI-05-23	05-1	11/26/2001	747.97	6
RFI-05-24	05-1	11/26/2001	749.26	5
RFI-05-25	05-1	11/26/2001	749.88	2
RFI-05-27	05-6	12/10/2001	754.32	2
RFI-05-29	05-6	12/10/2001	754.32	9
RFI-07-01R	07-1	1/12/2002	732.41	10
RFI-07-02*	07-1	6/13/2001	727.47	19
RFI-07-04*	07-1	6/14/2001	733.01	11
RFI-07-05*	07-2	6/14/2001	732.73	19
RFI-07-06*	07-3	7/20/2001	732.88	15
RFI-07-07*	07-3	7/20/2001	732.81	24
RFI-07-09	07-1	6/14/2001	729.68	12

See Notes on Page 5.

TABLE 2-1

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

SOIL BORING INVENTORY AND COMPLETION SUMMARY

Boring ID	Associated AOI	Completion Date	Ground Surface Elevation	Boring Total Depth (feet)
RFI-09-02*	09-A	5/16/2001	726.41	10
RFI-09-03*	09-A	5/16/2001	726.02	10
RFI-09-05*	09-B	5/16/2001	730.99	14
RFI-09-15	09-A	9/4/2001	726.27	3.9
RFI-09-16	09-A	9/4/2001	725.55	3.5
RFI-09-18	09-A	9/4/2001	---	3.2
RFI-09-19	09-A	9/4/2001	726.11	2.5
RFI-09-20	09-A	9/4/2001	726.00	2.5
RFI-09-21	09-A	9/4/2001	726.15	2.5
RFI-09-22	09-A	9/4/2001	725.43	4
RFI-09-23	09-A	9/4/2001	725.93	4
RFI-09-24	09-A	9/4/2001	726.27	4
RFI-09-25	09-A	9/4/2001	726.25	4
RFI-09-26	09-A	9/5/2001	730.72	2.7
RFI-09-27	09-A	9/4/2001	730.45	3
RFI-09-28	09-A	9/5/2001	730.90	2.5
RFI-09-29	09-A	9/5/2001	732.62	1.7
RFI-10-09	10-3	6/18/2001	751.52	2
RFI-10-10	10-3	6/18/2001	750.84	2
RFI-10-13	10-2	7/24/2001	753.01	14
RFI-10-14	10-2	6/27/2001	751.94	19
RFI-10-16	10-1	12/11/2001	749.38	6
RFI-10-17	10-1	11/30/2001	749.64	5
RFI-10-18	10-1	11/30/2001	750.08	5.5
RFI-10-19	10-1	11/29/2001	750.12	6
RFI-10-20	10-3	11/29/2001	750.21	2
RFI-10-21	10-3	11/29/2001	751.26	2
RFI-10-22	10-3	11/29/2001	751.08	2
RFI-10-23	10-2	11/30/2001	751.11	5
RFI-10-27	10-1	1/15/2002	---	19
RFI-12-01*	12-A	5/15/2001	742.52	12
RFI-12-03*	12-A	5/23/2001	739.30	14
RFI-12-04*	12-D	5/15/2001	739.30	14
RFI-12-05*	12-B	5/15/2001	742.40	8
RFI-12-06*	12-C	5/24/2001	742.77	15
RFI-12-08*	12-A	5/11/2001	742.61	22
RFI-12-10*	12-A	5/25/2001	738.84	14
RFI-12-16	12-A	9/10/2001	---	10
RFI-12-17	12-A	9/10/2001	---	10
RFI-12-18	12-A	9/7/2001	---	10
RFI-12-20	12-A	9/11/2001	---	5
RFI-16-02*	16-B	5/15/2001	740.11	24
RFI-16-03*	16-C	5/15/2001	731.35	12
RFI-16-05*	16-C	5/15/2001	734.58	10
RFI-16-06*	16-D	5/14/2001	737.64	12

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NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
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Boring ID	Associated AOI	Completion Date	Ground Surface Elevation	Boring Total Depth (feet)
RFI-16-13	16-C	12/4/2001	---	11
RFI-16-14	16-C	10/31/2001	---	12
RFI-16-15	16-C	10/31/2001	---	12
RFI-16-16	16-C	10/31/2001	---	7.5
RFI-16-17	16-C	10/31/2001	---	12
RFI-16-18	16-C	10/31/2001	---	7.3
RFI-16-19	16-C	10/31/2001	---	10
RFI-16-21	16-C	12/4/2001	---	3.5
RFI-16-22	16-C	10/31/2001	---	12
RFI-16-23	16-C	10/31/2001	---	8
RFI-17-01*	17-A	5/16/2001	721.20	14
RFI-21-01*	21-1	6/25/2001	744.46	19
RFI-21-02*	21-1	6/25/2001	745.26	13
RFI-21-03*	21-1	6/21/2001	744.99	21
RFI-29-01*	29-A	5/15/2001	743.25	10
RFI-29-02	29-A	9/5/2001	743.52	3
RFI-29-03	29-A	9/5/2001	743.16	3
RFI-36-01 Geotech	36-1	8/21/2001	756.17	26
RFI-36-25	36-1	3/27/2001	---	18
RFI-36-26	36-1	3/27/2001	---	18
RFI-36-28	36-1	3/29/2001	755.58	22
RFI-36-30	36-1	3/28/2001	753.51	16
RFI-36-33	36-2	3/29/2001	756.53	20
RFI-36-34	36-2	6/28/2001	750.26	15
RFI-36-36R	36-2	11/29/2001	750.46	3
RFI-36-37	36-2	9/4/2001	757.15	24
RFI-36-38	36-1	1/9/2002	754.26	16
RFI-36-39	36-1	12/16/2001	754.03	16
RFI-36-40	36-1	12/16/2001	753.92	16
RFI-36-41	36-2	11/29/2001	750.56	3
RFI-36-42	36-2	11/29/2001	749.99	3
RFI-38-01	38-1	7/23/2001	752.41	22
RFI-38-02	38-1	7/19/2001	752.37	19
RFI-38-03	38-1	7/18/2001	752.40	21
RFI-40-01*	40-A	5/24/2001	731.98	10
RFI-40-05	40-A	1/17/2002	732.04	16
RFI-40-06*	40-A	1/17/2002	732.98	19
RFI-40-08	40-A	1/25/2002	729.74	19
RFI-44-01*	44-A	5/17/2001	731.26	10
RFI-44-02*	44-A	5/17/2001	733.00	14
RFI-44-03*	44-A	5/17/2001	733.31	12
RFI-44-06*	44-A	9/5/2001	---	15
RFI-44-07	44-A	9/5/2001	---	2.7
RFI-44-09	44-A	11/21/2001	732.22	2.9
RFI-55-01 Geotech	55-1	8/3/2001	751.85	17

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NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
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Boring ID	Associated AOI	Completion Date	Ground Surface Elevation	Boring Total Depth (feet)
RFI-55-03	55-1	7/26/2001	754.01	3
RFI-55-04	55-1	7/26/2001	753.80	10
RFI-55-05	55-1	7/26/2001	753.99	10
RFI-55-06	55-1	7/26/2001	753.91	3.5
RFI-81-01	81-1	9/9/2001	746.17	7.5
RFI-81-05*	81-2	8/4/2001	746.08	17
RFI-81-06*	81-3	8/4/2001	745.74	18
RFI-81-07*	81-3	7/27/2001	741.31	14
RFI-81-10*	81-5	6/21/2001	746.22	24
RFI-81-12	81-3	11/21/2001	737.38	20
RFI-81-14	81-2	6/18/2001	742.65	2
RFI-81-15	81-2	6/18/2001	743.21	2
RFI-81-16	81-2	6/18/2001	742.76	2
RFI-81-17	81-2	6/18/2001	743.44	2
RFI-81-18	81-2	6/18/2001	743.14	2
RFI-81-19	81-2	9/17/2001	742.81	2
RFI-81-20*	81-2	8/4/2001	745.86	15
RFI-81-23*	81-1	9/7/2001	---	7
RFI-81-24*	81-1	9/7/2001	---	7
RFI-81-25	81-1	12/3/2001	743.95	10
RFI-81-26	81-1	12/12/2001	746.01	2
RFI-81-27	81-1	12/12/2001	745.99	2
RFI-81-28	81-2	12/12/2001	745.96	2.5
RFI-81-29	81-2	12/13/2001	745.95	1.1
RFI-81-30	81-2	12/13/2001	746.02	5.2
RFI-81-31	81-2	12/13/2001	---	5
RFI-81-32	81-2	12/13/2001	746.01	5
RFI-81-34	81-1	1/14/2002	---	12.5
RFI-83/84-03	83/84-1	1/29/2001	745.85	14
RFI-83/84-05*	83/84-3	7/24/2001	745.93	12
RFI-83/84-08*	83/84-4	7/24/2001	746.73	20
RFI-83/84-09*	83/84-5	7/23/2001	746.87	19
RFI-83/84-10	83/84-6	1/29/2001	745.82	14
RFI-83/84-12	83/84-2	12/17/2001	745.80	4.7
RFI-83/84-13*	83/84-2	12/7/2001	745.72	7
RFI-83/84-14	83/84-2	12/10/2001	745.74	2
RFI-83/84-15	83/84-2	12/10/2001	745.72	3
RFI-83/84-16	83/84-3	12/10/2001	745.69	4.8
RFI-83/84-17	83/84-3	12/10/2001	745.56	1.4
RFI-83/84-18	83/84-3	12/10/2001	745.61	4.8
RFI-83/84-19	83/84-3	12/10/2001	745.70	3.4
RFI-83/84-21	83/84-2	12/10/2001	746.01	10
RFI-83/84-22	83/84-2	12/10/2001	745.79	10
RFI-83/84-23	83/84-2	12/10/2001	745.93	7.2
RFI-83/84-24	83/84-2	12/10/2001	745.94	10

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NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
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Boring ID	Associated AOI	Completion Date	Ground Surface Elevation	Boring Total Depth (feet)
RFI-83/84-25	83/84-2	12/5/2001	745.83	20
RFI-83/84-26	83/84-4	12/7/2001	---	10
RFI-83/84-27	83/84-2	12/13/2001	741.92	10
RFI-83/84-28	83/84-2	12/13/2001	---	8
RFI-84-01	84-A	5/7/2001	727.64	19
RFI-84-02	84-A	5/7/2001	727.68	15
RFI-84-03	84-B	5/8/2001	727.69	16
RFI-84-04	84-C	5/8/2001	---	14
RFI-85-02*	85-1	6/22/2001	742.91	17
RFI-86-07*	86-1	5/23/2001	---	16
RFI-86-08*	86-1	7/20/2001	743.54	21
RFI-86-10	86-1	11/21/2001	718.05	8.5
RFI-86-11	86-1	11/21/2001	737.10	4.7
RFI-86-12R	86-1	11/21/2001	738.11	4.8
RFI-86-13	86-1	11/21/2001	737.00	4.8
RFI-94-01*	94-A	5/16/2001	723.54	10
RFI-94-02	94-B	8/30/2001	727.66	20
RFI-94-03*	94-C	5/8/2001	727.80	8
RFI-94-04*	94-C	5/8/2001	727.84	23
RFI-94-05	94-D	5/9/2001	727.48	22.5
RFI-94-06*	94-E	5/9/2001	732.95	10
RFI-EP-94-02A	EP	8/17/2001	---	16
RFI-EP-94-02B	EP	8/17/2001	---	16
WL-B1	Waste Lagoon	10/27/2000	729.70	18
WL-B2	Waste Lagoon	10/27/2000	727.70	16
WL-B3	Waste Lagoon	10/30/2000	729.50	20
WL-B4	Waste Lagoon	10/30/2000	724.90	16
WL-B5	Waste Lagoon	10/30/2000	723.10	16
WL-B6	Waste Lagoon	10/31/2000	722.40	16

Notes:
* = Grab groundwater sample location.
--- = Not Available

TABLE 2-2

GENERAL MOTORS CORPORATION
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MONITORING WELL INVENTORY AND COMPLETION SUMMARY

Well ID	Date Installed	Elevation	Boring Depth (ft-bgs)	Well Diameter (inches)	Screened Interval (ft-bgs)	Unit Screened	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/day)
03-02	3/16/2000	743.24	16	2	5-15	silt, sand, & clay	---	---
03-03	3/17/2000	747.01	18	2	8-18	fill, silt, and clay	---	---
03-101	---	---	---	2	---	---	2.83E-02	8.01E+01
03-104	5/8/1990	---	17.5	2	11-16	sand	---	---
03-105	5/7/1990	---	17.5	2	12-17	clay and sand	---	---
03-106	5/8/1990	---	11	2	6-11	fill and sand	---	---
03-109	5/3/1990	747.40	15	2	11-16	silt, sand, & clay	2.93E-04	8.30E-01
03-110	5/3/1990	746.95	15	2	8.5-13.5	silt, sand, & clay	---	---
03-111	5/3/1990	744.70	12	2	5-10	gravel and sand	1.72E-02	4.86E+01
03-112	5/3/1990	747.21	12.5	2	7.5-12.5	sand	---	---
03-114	5/4/1990	746.49	16.5	2	10-15	gravel and sand	3.27E-04	9.26E-01
04-1	3/8/2000	731.03	14	2	4-14	sand and clay	---	---
04-120	9/29/1995	750.52	24	2	10-17	silt, sand, & clay	2.56E-06	7.26E-03
04-121	9/29/1995	752.12	26	2	19-26	silt, sand, & clay	9.82E-04	2.78E+00
04-140	9/29/1995	751.06	22	2	15-22	silt, sand, & clay	5.19E-03	1.47E+01
04-160	10/10/1995	729.13	22	2	15-22	silt, sand, & clay	7.52E-04	2.13E+00
04-2	3/8/2000	730.37	14	2	4-14	clay, silt, & gravel	---	---
04-3	3/8/2000	730.19	14	2	4-14	clay, silt, & gravel	4.69E-03	1.33E+01
04-4	3/9/2000	---	14	2	2.5-12.5	sand, clay & gravel	8.59E-05	2.43E-01
04-5	---	730.69	---	2	---	---	---	---
11-120	10/4/1995	747.44	22	---	7-14	silt, sand, & clay	---	---
11-140	10/4/1995	741.78	24	---	11-18	silt, sand, & clay	---	---
20-100	10/23/1991	750.80	15	2	7.7-12.7	sand	---	---
20-101	10/15/1991	752.60	25	2	15-20	sand and silt	---	---
20-101R	11/5/2001	751.69	19	2	8 - 18	silt and clay	---	---
20-102	10/23/1991	752.30	15	2	10-15	sand and silt	1.87E-02	5.30E+01
20-103N	10/24-25/91	751.69	15.5	2	10.5-15.5	sand and silt	1.13E-03	3.20E+00
20-103S	7/21/1992	751.67	20	2	14.3-19.3	sand and silt	---	---
20-104	10/11/1991	751.00	20	2	7.5-12.5	fill and sand	---	---

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Well ID	Date Installed	Elevation	Boring Depth (ft-bgs)	Well Diameter (inches)	Screened Interval (ft-bgs)	Unit Screened	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/day)
20-105	10/21-22/91	752.10	16	2	11-16	sand	---	---
20-105R	11/21/2001	751.91	18	2	7-17	silt	---	---
20-106	12/18/1992	---	14	2	8-13	---	---	---
20-120	10/16/1991	749.45	15	2	7-12	sand	6.47E-02	1.83E+02
20-121	9/27/1991	753.25	27.5	2	11-16	sand	4.73E-03	1.34E+01
20-122	10/1/1991	752.40	25	2	11.5-16.5	sand	---	---
20-140	10/2-3/91	752.80	22.5	2	10-15	sand	---	---
20-141	10/10/1991	749.25	20	2	9.4-14.4	sand	---	---
20-142	10/18/1991	749.60	20	2	8.5-13.5	sand	---	---
20-143	10/4/1991	749.63	20	2	8-13	sand	---	---
20-144	10/7/1991	749.90	17.5	2	7.5-12.5	sand	---	---
20-145	10/8/1991	749.34	15	2	8.5-13.5	fill and sand	---	---
20-146	12/17/1992	---	6	2	1-6	---	---	---
20-160	12/17/1992	752.81	16	2	11-16	---	---	---
20-161	10/15/1991	751.90	20	2	14-19	silt, sand, & clay	---	---
20-162	12/21/1992	---	13	2	8-13	---	---	---
20-163	12/16/1992	750.44	17	2	10-15	---	---	---
20-164	12/16/1992	751.14	16	2	11-16	---	---	---
20-165	12/21/1992	749.97	15	2	10-15	---	---	---
20-167	9/21/1992	---	22	2	16-21	sand	---	---
20-169	9/29/1992	753.38	17	2	13-18	sand	---	---
20-170	10/22/1991	748.22	15	2	7.8-12.8	fill	---	---
20-171	10/8/1991	748.20	15	2	9-14	sand	---	---
20-500	7/17/1992	750.63	18.5	2	13.1-18.1	fill, sand, & silt	5.31E-03	1.50E+01
20-501	7/23/1992	750.18	18	2	12.9-17.9	silt, sand, & clay	---	---
20-502	7/22/1992	751.29	18	2	9.5-14.5	sand and silt	---	---
20-503	7/22/1992	751.54	15.9	2	10.9-15.9	sand and silt	---	---
20-504	10/19/1995	749.74	22	---	7-14	sand	7.33E-03	2.08E+01
20-505D	7/23/1992	752.20	19.8	2	14.8-19.8	silt and clay	---	---

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Well ID	Date Installed	Elevation	Boring Depth (ft-bgs)	Well Diameter (inches)	Screened Interval (ft-bgs)	Unit Screened	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/day)
20-505S	7/23/1992	750.54	14.2	2	9.2-14.2	sand and silt	---	---
20-506	7/23/1992	751.35	14.9	2	9.9-14.9	silt, sand, & clay	---	---
20-FP1	8/7/1998	752.17	20	2	6-15.8	fill and sand	---	---
20-FP10	8/10/1998	747.25	16	2	3.5-13.3	sand	---	---
20-FP11	5/4/1999	743.97	11	2	3-9.8	sand	2.14E-02	6.06E+01
20-FP12	5/4/1999	742.51	11	2	3-9.8	sand	---	---
20-FP2	7/30/1998	753.51	20	2	10-19.8	sand	---	---
20-FP4	7/31/1998	751.55	19	2	6-15.8	fill and sand	---	---
20-FP5	7/30/1998	748.82	17	2	4-13.8	fill	---	---
20-FP6	7/29/1998	747.91	17	2	10-14.8	sand	1.99E-04	5.65E-01
20-FP7	7/30/1998	748.53	17	2	4-13.8	fill and sand	---	---
20-FP8	7/30/1998	748.73	17	2	4-13.8	fill, sand, & silt	---	---
20-FP9	8/6/1998	749.45	18	2	4.5-14.3	sand and silt	---	---
30-100	10/9/1991	747.24	17.5	2	10-15	silt, sand, & clay	1.16E-03	3.28E+00
30-120	3/9/1993	747.48	20	2	5-20	clay and sand	1.58E-02	4.47E+01
30-140	3/9/1993	745.88	18	2	5-15	silt, sand, & clay	---	---
31-1	6/10/1997	735.19	20.5	2	15.5-20.5	silt and clay	---	---
31-2	6/10/1997	733.97	12	2	7-12	silt, sand, & clay	---	---
31-3	6/10/1997	734.44	18	2	13-18	silt, sand, & clay	---	---
31-4D	1/2/1902	733.87	---	---	---	---	---	---
31-4S	6/10/1997	733.90	12	2	7-12	silt and clay	---	---
31-5	3/7/2000	736.12	14	2	4-14	clay and sand	8.13E-05	2.30E-01
31-6	3/6/2000	734.54	14	2	4-14	clay and sand	1.09E-03	3.09E+00
31-7	3/6/2000	729.75	16	2	6-16	silt, sand, & clay	---	---
31-8	3/8/2000	730.26	18	2	5-15	sand and silt	1.75E-04	4.96E-01
36-100	10/6/1995	750.54	26	2	9-16	sand	---	---
36-101	10/6/1995	750.11	24	2	11-18	sand and silt	---	---
36-120	10/5/1995	754.47	26	2	11-18	sand	4.65E-02	1.32E+02
36-121	10/5/1995	753.79	26	2	13-20	sand	---	---

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MONITORING WELL INVENTORY AND COMPLETION SUMMARY

Well ID	Date Installed	Elevation	Boring Depth (ft-bgs)	Well Diameter (inches)	Screened Interval (ft-bgs)	Unit Screened	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/day)
36-160	10/9/1995	750.12	24	---	10-17	silt, sand, & clay	---	---
36-161	10/9/1995	---	24	---	3.5-10.5	sand and silt	---	---
36-FP1	8/5/1998	750.60	21	2	8-17.8	sand	---	---
36-FP2	8/5/1998	750.30	19	2	8-17.8	sand	---	---
36-FP3	8/5/1998	749.41	19	2	8-17.8	silt, sand, & clay	---	---
36-FP4	8/3-4/98	753.70	23	2	11.5-21.3	silt, sand, & clay	---	---
36-FP5	8/4/1998	753.84	23	2	11-20.8	silt, sand, & clay	2.20E-02	6.22E+01
36-FP6	8/6/1998	749.51	20	2	5-14.8	silt, sand, & clay	---	---
36-FP7	8/7/1998	750.02	19	2	7-16.8	clay and sand	---	---
36-FP8	5/6/1999	748.83	14	2	6-13	sand	---	---
37-01	3/16/2000	750.37	16	2	6-16	sand and silt	1.02E-03	2.88E+00
38-120	10/6/1995	748.43	26	2	11-18	sand	---	---
40-1	11/8/1996	733.43	8.5	2	3.5-8.5	sand	---	---
40-2	11/8/1996	736.47	10.5	2	5.5-10.5	clay and sand	4.34E-05	1.23E-01
40-3	12/10/1996	737.01	17	2	12-17	silt, sand, & clay	---	---
40-301	12/16/1993	732.05	17	2	12-17	---	6.73E-05	1.91E-01
40-302	12/16/1993	732.96	16	2	11-16	---	4.87E-04	1.38E+00
40-303	12/16/1993	729.41	13	2	8-13	---	---	---
40-303R	11/12/2001	730.46	33	2	22.5-32.5	silty clay	---	---
40-304	12/16/1993	731.11	11	2	6-11	---	4.31E-03	1.22E+01
40-305	12/16/1993	731.24	13.5	2	8.5-13.5	---	1.31E-04	3.72E-01
40-4	3/9/2000	738.17	16	2	5-15	fill, clay & sand	---	---
40-4R	11/13/2001	737.90	25	2	15-25	sand	---	---
40-5	3/9/2000	735.84	14	2	4-14	fill, clay & sand	8.25E-06	2.34E-02
40-6	3/9/2000	735.53	14	2	3-13	fill	6.71E-03	1.90E+01
40-7	3/10/2000	733.63	14	2	4-14	silt, sand, & clay	---	---
40-7R	11/20/2002	733.18	18.5	2	8-18	clay and sand	---	---
43-100	9/25/1991	753.07	22.5	2	10.5-15.5	sand	3.33E-03	9.44E+00
43-101	9/27/1991	753.50	20	2	10.5-15.5	sand	---	---

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Well ID	Date Installed	Elevation	Boring Depth (ft-bgs)	Well Diameter (inches)	Screened Interval (ft-bgs)	Unit Screened	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/day)
43-101R	11/8/2001	752.60	18	2	8-18	sand	---	---
43-102	3/8/1993	752.63	23	2	8-23	sand	---	---
43-103	10/5/1995	752.10	22	2	7-14	sand	---	---
43-120	10/3/1995	---	26	---	8-15	sand	---	---
43-140	10/10/1995	750.14	22	2	8-15	sand and silt	---	---
43-141	10/4/1995	752.78	20	2	10-17	sand and silt	---	---
43-160	10/1/1991	750.43	16	---	9-14	sand	---	---
43-161	10/3/1991	750.19	15	---	9-14	sand	---	---
43-162	10/3/1991	749.90	13.5	---	8.5-13.5	sand	---	---
43-163	10/16-17/91	749.65	17.5	---	8.5-13.5	sand and silt	---	---
43-164	10/21/1991	749.59	15	---	9.5-14.5	sand	---	---
43-165	3/20/2000	749.41	16	2	6-16	sand, clay & peat	---	---
43-166	3/21/2000	747.97	16	2	5-15	fill and sand	---	---
43-167	3/20/2000	748.43	16	2	5-15	sand	---	---
43-168	3/21/2000	750.10	16	2	5-15	sand and silt	---	---
43-169	3/21/2000	750.32	16	2	5-15	sand	---	---
43-220	5/13/1994	---	23	2	11-23	sand	4.49E-03	1.27E+01
43-242	5/10/1994	---	26	2	12-24	sand	1.07E-03	3.03E+00
44-04	5/16/2001	730.08	10	2	2.8-7.8	silt, sand, & clay	---	---
55-1	5/5/1999	753.43	17	2	9-15.8	sand	---	---
55-2	5/5/1999	753.06	17	2	9-15.8	sand	---	---
55-3	5/5/1999	753.52	15	2	7-13.75	sand and silt	---	---
55-4	5/5/1999	753.59	15	2	7-13.75	sand and silt	---	---
55-5	5/6/1999	753.94	18	2	10-17	sand	---	---
70-100	9/18/1991	742.36	27.5	2	20-25	silt, sand, & clay	4.49E-05	1.27E-01
70-101	8/19/1992	742.68	15	2	2-12	sand	---	---
70-102	8/19/1992	742.75	15	2	2-12	sand	3.54E-04	1.00E+00
70-103	8/19/1992	743.78	15	2	2-12	sand	---	---
70-104	8/19/1992	743.51	15	2	2-12	sand	---	---

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Well ID	Date Installed	Elevation	Boring Depth (ft-bgs)	Well Diameter (inches)	Screened Interval (ft-bgs)	Unit Screened	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/day)
70-105	8/19/1992	745.15	20	2	2-12	sand and silt	---	---
70-106	10/17/1991	743.60	12.5	2	4.5-9.5	silt, sand, & clay	---	---
70-107	9/17/1991	742.58	25	2	15-20	silt, sand, & clay	---	---
70-108	9/18-19/91	744.06	17	2	10-15	silt, sand, & clay	---	---
70-109	8/19/1992	741.60	15	2	2-12	sand	1.93E-04	5.47E-01
70-160	10/9/1995	739.41	22	2	15-22	clay and sand	3.93E-04	1.11E+00
70-161	10/19/1995	---	18	---	3-10	sand	---	---
70-162	2/21/1996	743.45	14	2	3.5-13.1	fill and sand	---	---
70-163	2/21/1996	742.59	10	2	3-9.8	silt, sand, & clay	1.98E-03	5.61E+00
70-164	2/21/1996	742.37	10	2	3-9.6	sand	---	---
70-165	2/21/1996	741.26	14	2	5-9.8	fill and sand	3.25E-03	9.19E+00
83/84-04	1/29/2001	745.65	18	1.5	11-16	clay	---	---
83/84-05	7/24/2001	745.93	12	1	6-11	sand and clay	---	---
83/84-06	9/12/2001	745.58	17	1	7-17	silt, sand, & clay	---	---
83/84-07	7/25-8/1/01	746.56	19	2	8.8-18.8	silt and sand	---	---
83/84-08	7/24/2001	746.73	20	1	9-19	silt, sand, & clay	---	---
83/84-09	7/23/2001	746.87	19	1	8-18	silt, sand, & clay	---	---
84-4	5/8/2001	727.25	14	1	9-14	sand and clay	---	---
84-5	5/24/2001	727.87	22	2	8-18	silty clay	---	---
84-6	5/21/2001	726.49	12	2	6.8-11.8	silt, sand, & clay	---	---
86-1	6/2/1997	743.20	9	2	4-9	sand and silt	---	---
86-100	10/10/1995	740.05	24	2	7-14	gravel, sand & silt	3.08E-04	8.74E-01
86-2	6/3/1997	742.93	10	2	5-10	silt, sand, & clay	---	---
86-3	6/3/1997	746.31	19	2	14-19	silt, sand, & clay	2.67E-04	7.57E-01
87-FP1	8/4/1998	715.79	9	2	1.5-6.3	gravel and sand	---	---
87-FP2	8/3/1998	742.24	19	2	8-17.8	silt, sand, & clay	5.82E-02	1.65E+02
87-FP3	8/3/1998	739.07	15	2	5-14.8	silt, sand, & clay	4.85E-03	1.37E+01
87FP4	8/12/1998	742.11	23	2	11.9-21.7	sand	---	---
87-FP5	8/12/1998	741.01	15	2	4-13.8	sand	---	---

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87-FPD2	8/11/1998	742.05	38	2	29-33.8	gravel and sand	---	---
87-FPD3	8/11-12/98	739.21	46	2	41-45.8	gravel, sand & silt	---	---
88-1*	11/6/1996	741.09	17	2	12-17	silt	---	---
88-2	11/6/1996	741.37	16	2	11-16	sand	7.61E-06	2.16E-02
88-3*	11/6/1996	---	15	2	10-15	sand	---	---
88-4	11/8/1996	741.37	12	2	7-12	sand	---	---
88-5	6/2/1997	742.08	12	2	7-12	sand	---	---
88-6	6/2/1997	741.60	12	2	7-12	sand	---	---
88-7	3/15/2000	742.20	18	2	8-18	silt, sand, & clay	---	---
88-8	3/12/2000	741.53	24	2	12-22	silt, sand, & clay	1.72E-03	4.87E+00
88-9	3/14/2000	741.86	20	2	9-19	silt, sand, & clay	---	---
94-100	9/26/1995	720.36	20	2	12-19	silt and clay	---	---
94-101	10/23/1995	---	26	2	7-14	silt, sand, & clay	---	---
BD01-01	12/3/2001	---	28	2	21-26	sand, silty sand	---	---
BD01-03	12/3/2001	---	24	1	19 - 24	silt and sand	---	---
GM-1	---	724.64	---	2	---	---	---	---
GM-10	---	725.79	---	---	---	---	---	---
GM-12	---	738.62	---	2	---	---	---	---
GM-2	---	725.40	---	---	---	---	---	---
GM-3	---	725.54	---	---	---	---	---	---
GM-4	---	738.12	---	2	---	---	---	---
GM-5	---	737.05	---	---	---	---	---	---
GM-6	---	734.96	---	---	---	---	---	---
GM-7	---	739.81	---	---	---	---	---	---
GM-8	---	738.71	---	---	---	---	---	---
GM-9	---	724.39	---	---	---	---	---	---
MW-00-FP6	---	740.55	---	---	---	---	---	---
MW-00-FP7	---	740.73	---	---	---	---	---	---
MW-00-FP8	---	741.43	---	---	---	---	---	---

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Well ID	Date Installed	Elevation	Boring Depth (ft-bgs)	Well Diameter (inches)	Screened Interval (ft-bgs)	Unit Screened	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/day)
MW-07-01	---	732.41	---	---	---	---	---	---
MW-07-02	---	736.75	---	---	---	---	---	---
OW-3D	---	736.78	---	---	---	---	---	---
OW-3S	---	738.34	---	---	---	---	---	---
OW-5	---	725.32	---	---	---	---	---	---
RFI-02-05	5/18/2001	738.88	8	2	2.8 - 7.8	silt, sand, & clay	3.64E-02	1.03E+02
RFI-02-07	5/18/2001	735.06	12	2	6.8 - 11.8	clay and sand	9.42E-03	2.67E+01
RFI-02-08	5/21/2001	735.82	18	2	3.8 - 13.8	silt, sand, & clay	8.47E-05	2.40E-01
RFI-03-01	8/1-2/01	748.38	21	2	9-19	silt, sand, & clay	---	---
RFI-03-02	6/25/2001	742.35	17	2	5-15	silt, sand, & clay	---	---
RFI-03-03	6/22/2001	742.01	14	2	2.5-12.5	gravel, silt, & sand	6.84E-04	1.94E+00
RFI-03-04	7/23/2001	746.67	16	2	5-15	silt and sand	---	---
RFI-05-01	6/26/2001	750.38	17	2	7-17	silt and sand	---	---
RFI-05-02	1/23/2001	754.10	18	1.5	12-17	sand	---	---
RFI-05-03	6/26/2001	752.43	20	2	8-18	silt and sand	6.17E-02	1.75E+02
RFI-05-04	1/24/2001	754.32	16	1.5	10-15	sand and clay	8.15E-03	2.31E+01
RFI-05-05	1/23/2001	754.34	16	1.5	10-16	sand	---	---
RFI-05-06	7/25-26/01	752.13	22	2	10-20	silt	3.19E-02	9.02E+01
RFI-05-07	1/24/2001	754.38	16	1.5	11-16	sand	1.26E-02	3.56E+01
RFI-05-08	6/27/2001	755.77	14	1	4-14	sand and clay	---	---
RFI-05-09	6/27/2001	751.65	18	1	6-16	silt, sand, & clay	---	---
RFI-05-10	1/23/2001	754.21	17	1.5	12-17	sand	6.02E-03	1.71E+01
RFI-05-11	1/23/2001	754.42	17.5	1.5	12.5-17.5	sand	---	---
RFI-05-12	1/24/2001	754.03	16	1.5	11-16	sand	2.16E-03	6.11E+00
RFI-05-13	1/22/2001	754.16	16	1.5	11-16	sand	---	---
RFI-05-14	1/22/2001	754.12	17	1.5	12-17	sand	---	---
RFI-05-19D*	7/23/2001	749.31	29	2	26.5-28.5	silt, sand, & clay	---	---
RFI-05-19DR	11/7/2001	749.48	29	2	20-25	clay	---	---
RFI-05-19S	6/26/2001	749.48	17	2	7-17	silt and sand	4.43E-02	1.26E+02

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RFI-05-20	6/22/2001	750.41	17	2	5.5-15.5	silt and sand	2.88E-02	8.15E+01
RFI-05-21	6/26/2001	748.73	18	2	8-18	silt, sand, & clay	---	---
RFI-05-30	1/10/2002	748.54	16	2	6-16	sand	---	---
RFI-07-01	6/22/2001	730.56	12	2	4-9	silt	---	---
RFI-07-03	6/14/2001	726.74	10	2	2-7	clay and silt	---	---
RFI-07-08	7/30/2001	728.12	23.5	2	10-20	sand and clay	7.27E-05	2.06E-01
RFI-09-01	5/29/2001	725.15	15	2	2.8 - 12.8	silt	2.03E-04	5.74E-01
RFI-09-04	5/30/2001	725.92	14	2	3.3 - 13.3	sand and silt	---	---
RFI-09-04R	---	725.95	19	2	14-19	---	---	---
RFI-09-06	5/30/2001	727.66	14	2	3.5 - 13.5	silt, sand, & clay	3.11E-03	8.82E+00
RFI-09-07	5/29/01 - 5/30/01	727.51	17	2	5.3 - 15.3	sand and silt	---	---
RFI-09-08	5/29/2001	728.45	15	2	3.8 - 13.8	silt and clay	4.00E-06	1.13E-02
RFI-09-09	5/29/2001	728.20	16	2	3.8 - 13.8	silt, sand, & clay	---	---
RFI-09-10	5/29/2001	726.45	26	2	3.5 - 13.5	silt, sand, & clay	2.97E-04	8.42E-01
RFI-09-11	6/11/2001	728.85	24	2	4 - 14	silt and clay	3.35E-04	9.50E-01
RFI-09-12	6/11/2001	729.77	14	2	6 - 11	silt, sand, & clay	---	---
RFI-09-13	9/13/2001	725.09	18	2	6-16	sand and clay	2.24E-03	6.34E+00
RFI-09-14	9/13/2001	724.44	18	2	6-16	sand and clay	9.14E-03	2.59E+01
RFI-10-01	7/26/2001	749.11	17	2	6-16	silt, sand, & clay	9.45E-03	2.68E+01
RFI-10-02	6/27/2001	750.54	19	2	7-17	silt	---	---
RFI-10-03	6/27/2001	751.79	19	2	8-18	silt and sand	---	---
RFI-10-04	7/19/2001	750.64	17	2	5-15	silt and sand	3.37E-03	9.54E+00
RFI-10-05	8/27/2001	751.59	20	2	9.9-19.9	silt, sand, & clay	4.26E-04	1.21E+00
RFI-10-06	7/20/2001	752.17	17	2	7-17	silt and sand	7.51E-03	2.13E+01
RFI-10-07	11/9/2001	751.33	17	2	7-17	---	---	---
RFI-10-08	6/28/2001	750.79	19	2	8-18	silt and sand	1.28E-03	3.64E+00
RFI-10-11	7/19/2001	746.14	15	2	4-14	silt and sand	---	---
RFI-10-12	6/27/2001	750.35	19	2	8-18	silt and sand	---	---
RFI-10-15	8/27/2001	751.25	18	2	7.9-17.9	silt and sand	3.34E-04	9.46E-01

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RFI-10-24	1/23/2002	---	18	2	6-16	silt, sand, & clay	---	---
RFI-10-25	1/23/2001	---	18	2	6-16	silt, sand, & clay	---	---
RFI-10-26	1/12/2002	---	16	2	5-15	sand	---	---
RFI-12-01R	5/14/2001	741.98	12	2	5-15	silt, sand, & clay	---	---
RFI-12-02	7/25/2001	742.41	20	2	10 - 20	silt and clay	---	---
RFI-12-07	5/10/2001	742.43	19.7	2	13 - 18	silty sand	---	---
RFI-12-07(Replaced)	---	742.43	20.1	2	10-20	silt, sand, & clay	---	---
RFI-12-08(Replaced)	---	742.08	20	2	10-20	silt, sand, & clay	---	---
RFI-12-09	7/26/2001	742.68	18	2	7 - 17	silt, sand, & clay	---	---
RFI-12-11D	6/5/01 - 6/6/01	742.09	25.1	2*	18 - 23	silt, sand, & clay	---	---
RFI-12-11S	6/6/2001	742.17	14.5	2*	4.5 - 14.5	silt and clay	7.72E-06	2.19E-02
RFI-12-12S	6/6/2001	---	14.5	2*	4.3-14.3'	silt and clay	---	---
RFI-12-14	5/22/2001	742.15	25	2*	12.5 - 22.5	sand and clay	---	---
RFI-12-15	6/8/2001	742.13	19	2*	7.8 - 17.8	fill and clay	---	---
RFI-12-21	11/27/2001	---	20	2	9.5-19.5	sand and clay	---	---
RFI-12-22	1/30/2002	724.00	23	2	11-21	---	---	---
RFI-16-01	5/31/01 - 6/1/01	736.10	14	2	4 - 14	silt and clay	3.00E-05	8.50E-02
RFI-16-04	5/18/2001	732.27	12	2	6.8 - 11.8	silt	8.22E-04	2.33E+00
RFI-16-07	6/6/2001	733.26	11.5	2*	1.4 - 11.4	silt	1.79E-02	5.08E+01
RFI-16-08	6/7/2001	733.18	13.5	2*	2.5 - 12.5	silt, sand, & clay	---	---
RFI-16-09	6/7/2001	733.39	13	2*	4.5 - 9.5	silt, sand, & clay	2.09E-03	5.92E+00
RFI-16-10	6/8/2001	736.09	15	2*	4 - 14	silt, sand, & clay	---	---
RFI-16-11	6/12/2001	736.49	15	2	5 - 15	silt and clay	8.98E-04	2.54E+00
RFI-16-12	1/31/2002	735.58	15.1	1	5-15	silt, sand, & clay	---	---
RFI-16-20	12/4/2001	---	12	2	6-11	silt	---	---
RFI-17-02	5/14/2001	720.27	14	2	4 - 14	silt, sand, & clay	3.37E-03	9.54E+00
RFI-21-04	11/6/2001	746.10	19	2	8-18	silt, sand, & clay	---	---
RFI-23-01	5/22/2001	742.19	18	2	4 - 14	silt, sand, & clay	4.33E-04	1.23E+00
RFI-23-02	5/22/2001	740.37	18	2	3.3 - 13.3	silt and clay	9.96E-05	2.82E-01

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							(cm/sec)	(ft/day)
RFI-36-01	8/21/2001	756.63	26	2	15.1-25.1	silt, sand, & clay	---	---
RFI-36-02	9/17/2001	751.96	23	2	13-23	silt and sand	---	---
RFI-36-03	12/20/2000	751.31	20	1.5	14.5-19.5	sand	---	---
RFI-36-04	12/19/2000	756.14	24	1.5	18.1-23.1	sand	1.04E-02	2.94E+01
RFI-36-05	12/18/2000	755.07	22	1.5	17-22	sand	4.28E-02	1.21E+02
RFI-36-06	12/19/2000	755.29	21	1.5	16-21	sand	---	---
RFI-36-07	12/20/2000	753.99	20	1.5	15-20	sand and clay	---	---
RFI-36-08	7/17/2001	749.29	17	2	6-16	silt	2.50E-03	7.07E+00
RFI-36-09	7/17/2001	750.78	16	2	6-16	silt and sand	1.32E-02	3.74E+01
RFI-36-10	7/18/2001	750.21	16	2	6-16	silt and sand	5.51E-03	1.56E+01
RFI-36-11	12/21/2000	752.89	18	1.5	10.9-15.9	sand	---	---
RFI-36-12	12/20/2000	753.52	14	1.5	9.2-14.2	silt and sand	1.35E-03	3.84E+00
RFI-36-13	7/27/2001	751.81	19	2	9-19	silt	---	---
RFI-36-14	7/16/2001	750.00	18	2	6-16	silt and sand	1.44E-03	4.08E+00
RFI-36-15	12/20/2000	754.47	20	1.5	14.5-19.5	silt and sand	---	---
RFI-36-16	12/19-20/00	754.87	24	1.5	16-21	silt, sand, & clay	---	---
RFI-36-17	8/29/2001	753.93	22	2	12-22	silt and sand	---	---
RFI-36-18	8/30/2001	753.12	24	2	14-24	silt and sand	---	---
RFI-36-19	8/28/2001	753.31	22	2	11.5-21.5	silt and sand	---	---
RFI-36-20	8/28/2001	757.01	24	2	12-22	silt and sand	6.29E-02	1.78E+02
RFI-36-21	3/27/2001	754.64	19	1.5	13.5-18.5	silt and sand	---	---
RFI-36-22	3/27/2001	754.37	18	1.5	12-17	silt and sand	---	---
RFI-36-23	3/27/2001	754.20	18	1.5	12-17	silt	---	---
RFI-36-24	3/26/2001	754.05	17	1.5	11-16	silt and sand	---	---
RFI-36-25R	12/15/2001	754.67	19.5	2	9.5-19.5	silt and sand	---	---
RFI-36-27	3/26/2001	755.46	22	1.5	16-22	sand	---	---
RFI-36-29	3/28/2001	753.86	16.5	1.5	11.5-16.5	sand	---	---
RFI-36-29R	12/15/2001	753.72	22	2	11-21	sand	---	---
RFI-36-31	3/28/2001	753.51	16.5	1.5	11.5-16.5	silt and sand	---	---

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TABLE 2-2

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

MONITORING WELL INVENTORY AND COMPLETION SUMMARY

Well ID	Date Installed	Elevation	Boring Depth (ft-bgs)	Well Diameter (inches)	Screened Interval (ft-bgs)	Unit Screened	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/day)
RFI-36-32	3/28/2001	756.28	22.5	1.5	17.5-22.5	sand	1.78E-02	5.04E+01
RFI-36-35	3/27/2001	750.05	26	2	15-25	sand	5.26E-05	1.49E-01
RFI-36-36	6/29/2001	750.19	16	2	6-16	silt, sand, & clay	---	---
RFI-36-43	12/15/2001	753.26	21	2	10-20	silt and sand	---	---
RFI-36-44	1/25/2002	752.45	19	2	9-19	silt and sand	---	---
RFI-36-45	1/24/2002	752.83	20	2	10-20	silt and sand	---	---
RFI-36-46	1/10/2002	750.13	20	2	10-20	sand	---	---
RFI-38-04	8/22/2001	751.58	26	2	15-25	silt and sand	---	---
RFI-38-05	8/24/2001	750.79	26	2	15-25	silt and sand	---	---
RFI-38-06	8/24/2001	749.43	22	2	12-22	silt and sand	---	---
RFI-40-02	1/25/2002	735.35	20.1	2	10-20	silt and clay	---	---
RFI-40-03	---	735.33	16	2	6-16	---	---	---
RFI-40-04	1/15/2002	731.89	33	2	23-33	silt and sand	---	---
RFI-40-07	1/18-1/22/2001	729.35	19	2	9-19	silt and clay	---	---
RFI-40-09	1/25/2002	731.85	19	2	9-19	silt, sand, & clay	---	---
RFI-44-04	5/16/2001	731.89	10	2	2.8 - 7.8	silt, sand, & clay	8.68E-04	2.46E+00
RFI-44-05	5/16/2001	731.97	18	2	8 - 18	silt and clay	3.19E-05	9.04E-02
RFI-55-01	8/3/2001	751.85	17	2	6-16	silt, sand, & clay	3.89E-03	1.10E+01
RFI-55-02	7/27/2001	752.88	20	2	9-19	silt and sand	---	---
RFI-55-09	6/27/2001	753.75	21	1	9-19	silt and sand	---	---
RFI-55-10	1/23/2002	751.86	17	2	6-16	silt and fine sand	---	---
RFI-65-01	7/27/2001	742.82	15	2	5-15	silt, sand, & clay	5.57E-03	1.58E+01
RFI-81-02	9/9/2001	745.92	22	1	12-22	silt	---	---
RFI-81-03	6/21/2001	745.70	22	2	9-19	silt, sand, & clay	---	---
RFI-81-04	1/25/2001	745.83	16	1.5	9-14	sand	---	---
RFI-81-08	6/21/2001	741.43	18	2	7-17	clay and silt	1.10E-04	3.12E-01
RFI-81-09	6/25/2001	745.89	18	2	11-21	silt and sand	---	---
RFI-81-11	6/20/2001	740.34	14	2	4-14	silt, sand, & clay	4.73E-02	1.34E+02
RFI-81-12R	6/15/2001	742.60	20	2	8-18	clay and silt	---	---

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GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

MONITORING WELL INVENTORY AND COMPLETION SUMMARY

Well ID	Date Installed	Elevation	Boring Depth (ft-bgs)	Well Diameter (inches)	Screened Interval (ft-bgs)	Unit Screened	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/day)
RFI-81-13	6/27/2001	744.61	18	2	11-16	clay and silt	1.87E-03	5.31E+00
RFI-81-21	9/17/2001	753.80	20	1	9-19	silt and sand	---	---
RFI-81-22	6/22/2001	742.58	14	2	3-13	silt, sand, & clay	---	---
RFI-81-33	1/18/2002	736.94	15	2	9.1-14.1	silt, sand, & clay	---	---
RFI-81-35	1/22/2002	743.23	20	2	10-20	---	---	---
RFI-83/84-01	6/18/2001	741.34	12	2	2-12	silt, sand, & clay	---	---
RFI-83/84-02	6/18/2001	741.59	14	2	4-14	silt, sand, & clay	5.02E-04	1.42E+00
RFI-83/84-04	1/29/2001	745.51	18	1.5	11-16	sand and clay	---	---
RFI-83/84-06	9/12/2001	745.58	17	2	7-17	silt, sand, & clay	---	---
RFI-83/84-07	8/1/2001	746.56	19	2	8.8-18.8	silt and sand	---	---
RFI-83/84-11	6/25/2001	741.61	22	2	5-15	silt and sand	---	---
RFI-83/84-20	1/28/2002	745.24	17	2	6.9-17	sand and clay	---	---
RFI-83/84-27R	12/13/2001	741.92	20	2	10-20	silt and sand	---	---
RFI-83/84-29	1/17/2002	---	19	2	7-17	silt and sand	---	---
RFI-84-05	5/24/2001	726.63	22	2	8 - 18	silt and clay	3.09E-06	8.75E-03
RFI-84-06	5/21/2001	723.26	12	2	6.8 - 11.8	silt, sand, & clay	---	---
RFI-85-02R	12/5/2001	---	18	2	6.6-16.6	sand and clay	---	---
RFI-85-03	6/20/2001	746.21	17	2	7-17	silt, sand, & clay	---	---
RFI-85-04	7/30/2001	746.00	18	2	11-16	sand and clay	---	---
RFI-85-04R	12/11/2001	745.95	26.5	2	21.5-26.5	---	---	---
RFI-85-05	7/24/2001	745.95	24	2	19-24	silt, sand, & clay	---	---
RFI-85-06	6/22/2001	742.43	19	2	9-19	silt and sand	6.41E-03	1.82E+01
RFI-85-07	11/7/2001	745.97	21	2	11-21	silt, sand, & clay	---	---
RFI-86-01	5/23/2001	---	24	2	9-19	sand and clay	5.80E-01	1.64E+03
RFI-86-01R	7/27/2001	735.50	27	2	21-26	silt, sand, & clay	---	---
RFI-86-02	7/31/2001	735.65	17	2	6.8-16.8	silt and sand	---	---
RFI-86-03	6/20/2001	736.62	18	2	5-15	silt, sand, & clay	2.30E-02	6.53E+01
RFI-86-04	7/24/2001	737.29	15	2	5-15	silt, sand, & clay	1.31E-03	3.70E+00
RFI-86-05	6/20/2001	742.47	19	2	6-16	silt, sand, & clay	1.86E-04	5.25E-01

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TABLE 2-2

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

MONITORING WELL INVENTORY AND COMPLETION SUMMARY

Well ID	Date Installed	Elevation	Boring Depth (ft-bgs)	Well Diameter (inches)	Screened Interval (ft-bgs)	Unit Screened	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/day)
RFI-86-06D	6/15/2001	737.21	26	2	14.5-24.5	silt, sand, & clay	6.57E-06	1.86E-02
RFI-86-06S	6/15/2001	737.32	15	2	9.5-14.5	silt and sand	8.57E-03	2.43E+01
RFI-86-08R	1/28/2002	743.58	20.5	2	10.3-20.3	silt, sand, & clay	---	---
RFI-86-12	6/15/2001	738.11	20	2	10-20	silt and clay	---	---
RFI-86-14	1/9/2002	---	18	2	9-17	sand	---	---
RFI-86-15	1/12/2002	---	25	2	10-20	gravel, sand, and silt	---	---
RW-1-P1	---	751.11	---	---	---	---	---	---
RW-1-P2	---	751.30	---	---	---	---	---	---
RW-07-P1	---	753.23	---	---	---	---	---	---
RW-3A-P1	---	750.73	---	---	---	---	---	---
RW-3A-P2	---	750.40	---	---	---	---	---	---

Notes:
Monitoring wells are constructed with schedule 40 PVC.
Hydraulic conductivity data are based on specific capacity tests.
*Well has been abandoned or destroyed.
cm/sec = centimeters per second.
ft-bgs = feet below ground surface.
ft/day = feet per day.
--- = Not Available

TABLE 2-3

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
38-1	RFI-38-01(0.5-2.5)	7/23/01	x	x	x	x	
38-1	RFI-38-01(18.5-20.5)	7/23/01	x	x	x	x	
38-1	RFI-38-01(8.5-10.5)	7/23/01	x	x	x	x	
38-1	RFI-38-02(01-03)	7/19/01	x	x	x	x	
38-1	RFI-38-02(05-07)	7/19/01	x	x	x	x	
38-1	RFI-38-02(15-17)	7/19/01	x	x	x	x	
38-1	RFI-38-03(01-03)	7/18/01	x	x	x	x	
38-1	RFI-38-03(05-07)	7/18/01	x	x	x	x	
38-1	RFI-38-03(09-11)	7/18/01	x	x	x	x	
38-1	RFI-38-03(17-19)	7/18/01	x	x	x	x	
38-1	RFI-38-04(0.2-2.2)	8/21/01	x	x	x	x	
38-1	RFI-38-04(16.2-18.2)	8/21/01	x	x	x	x	
38-1	RFI-38-04(8.2-10.2)	8/21/01	x	x	x	x	
38-1	RFI-38-05(0.6-2.6)	8/24/01	x	x	x	x	
38-1	RFI-38-05(14.6-16.6)	8/24/01	x	x	x	x	
38-1	RFI-38-05(8.6-10.6)	8/24/01	x	x	x	x	
38-1	RFI-38-06(0.5-2.5)	8/24/01	x	x	x	x	
38-1	RFI-38-06(12.5-14.5)	8/24/01	x	x	x	x	
38-1	RFI-38-06(8.5-10.5)	8/24/01	x	x	x	x	
38-1	RFI-38-Dup-37	7/18/01	x	x	x	x	Duplicate of RFI-38-03(05-07)
38-1	RFI-38-Dup-39	7/23/01	x	x	x	x	Duplicate of RFI-38-01(18.5-20.5)
38-1	RFI-38-DUP-49	8/24/01	x	x	x	x	Duplicate of RFI-38-05(8.6-10.6)
36-1	RFI-36-01(0.5-2.5)	8/21/01	x	x	x	x	
36-1	RFI-36-01(12.5-14.5)	8/21/01	x	x	x	x	
36-1	RFI-36-01(8.5-10.5)	8/21/01	x	x	x	x	
36-1	RFI-36-02(01-03)	9/17/01	x	x	x	x	
36-1	RFI-36-02(07-09)	9/17/01	x	x	x	x	
36-1	RFI-36-02(09-11)	9/17/01	x	x	x	x	
36-1	RFI-36-02(13-15)	9/17/01	x	x	x	x	
36-1	RFI-36-03(0.8-02)	12/20/00	x	x		x	
36-1	RFI-36-03(08-10)	12/20/00	x	x		x	
36-1	RFI-36-03(14-16)	12/20/00	x	x		x	
36-1	RFI-36-04(0.6-02)	12/19/00	x	x		x	
36-1	RFI-36-04(08-10)	12/19/00	x	x		x	
36-1	RFI-36-04(18-20)	12/19/00	x	x		x	
36-1	RFI-36-05(0.8-02)	12/18/00	x	x		x	
36-1	RFI-36-05(08-10)	12/18/00	x	x		x	
36-1	RFI-36-05(16-18)	12/18/00	x	x		x	
36-1	RFI-36-06(0.7-02)	12/19/00	x	x		x	
36-1	RFI-36-06(06-08)	12/19/00	x	x		x	
36-1	RFI-36-06(16-17)	12/19/00	x	x		x	
36-1	RFI-36-07(0.8-02)	12/20/00	x	x		x	
36-1	RFI-36-07(08-10)	12/20/00	x	x		x	
36-1	RFI-36-07(12-14)	12/20/00	x	x		x	
36-1	RFI-36-15(0.8-02)	12/20/00	x	x		x	
36-1	RFI-36-15(08-10)	12/20/00	x	x		x	
36-1	RFI-36-15(14-16)	12/20/00	x	x		x	
36-1	RFI-36-16(0.9-02)	12/19/00	x	x		x	

TABLE 2-3

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
36-1	RFI-36-16(08-10)	12/19/00	x	x		x	
36-1	RFI-36-16(18-20)	12/19/00	x	x		x	
36-1	RFI-36-17(00-02)	8/29/01	x				
36-1	RFI-36-17(08-10)	8/29/01	x				
36-1	RFI-36-17(12-14)	8/29/01	x				
36-1	RFI-36-18(00-02)	8/30/01	x				
36-1	RFI-36-18(08-10)	8/30/01	x				
36-1	RFI-36-18(12-14)	8/30/01	x				
36-1	RFI-36-21(06-08)	3/28/01	x	x	x	x	
36-1	RFI-36-21(08-10)	3/28/01	x	x	x	x	
36-1	RFI-36-21(10-12)	3/28/01	x	x	x	x	
36-1	RFI-36-21(12-14)	3/28/01	x	x	x	x	
36-1	RFI-36-22(00-02)	3/27/01	x	x	x	x	
36-1	RFI-36-22(08-10)	3/27/01	x	x	x	x	
36-1	RFI-36-22(10-12)	3/27/01	x	x	x	x	
36-1	RFI-36-23(00-02)	3/28/01	x	x	x	x	
36-1	RFI-36-23(08-10)	3/28/01	x	x	x	x	
36-1	RFI-36-23(10-12)	3/28/01	x	x	x	x	
36-1	RFI-36-24(00-02)	3/26/01	x	x	x	x	
36-1	RFI-36-24(06-08)	3/26/01	x	x	x	x	
36-1	RFI-36-24(08-10)	3/26/01	x	x	x	x	
36-1	RFI-36-24(10-12)	3/26/01	x	x	x	x	
36-1	RFI-36-25(00-02)	3/27/01	x	x	x	x	
36-1	RFI-36-25(08-10)	3/27/01	x	x	x	x	
36-1	RFI-36-25(12-14)	3/27/01	x	x	x	x	
36-1	RFI-36-25R(01-03)	12/15/01	x	x	x	x	
36-1	RFI-36-25R(07-09)	12/15/01	x	x	x	x	
36-1	RFI-36-25R(11-13)	12/15/01	x	x	x	x	
36-1	RFI-36-26(00-02)	3/26/01	x	x	x	x	
36-1	RFI-36-26(02-04)	3/27/01	x	x	x	x	
36-1	RFI-36-26(08-10)	3/27/01	x	x	x	x	
36-1	RFI-36-26(10-12)	3/27/01	x	x	x	x	
36-1	RFI-36-27(00-02)	3/26/01	x	x	x	x	
36-1	RFI-36-27(08-10)	3/26/01	x	x	x	x	
36-1	RFI-36-27(12-14)	3/26/01	x	x	x	x	
36-1	RFI-36-27(14-16)	3/26/01	x	x	x	x	
36-1	RFI-36-28(00-02)	3/29/01	x	x	x	x	
36-1	RFI-36-28(08-10)	3/29/01	x	x	x	x	
36-1	RFI-36-28(10-12)	3/29/01	x	x	x	x	
36-1	RFI-36-28(14-16)	3/29/01	x	x	x	x	
36-1	RFI-36-29(00-02)	3/28/01	x	x	x	x	
36-1	RFI-36-29(08-10)	3/28/01	x	x	x	x	
36-1	RFI-36-29(10-12)	3/28/01	x	x	x	x	
36-1	RFI-36-30(00-02)	3/28/01	x	x	x	x	
36-1	RFI-36-30(08-10)	3/28/01	x	x	x	x	
36-1	RFI-36-30(10-12)	3/28/01	x	x	x	x	
36-1	RFI-36-31(00-02)	3/28/01	x	x	x	x	
36-1	RFI-36-31(08-10)	3/28/01	x	x	x	x	

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GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
36-1	RFI-36-31(10-12)	3/28/01	x	x	x	x	
36-1	RFI-36-32(00-02)	3/28/01	x	x	x	x	
36-1	RFI-36-32(08-10)	3/28/01	x	x	x	x	
36-1	RFI-36-32(12-14)	3/28/01	x	x	x	x	
36-1	RFI-36-32(16-18)	3/28/01	x	x	x	x	
36-1	RFI-36-33(00-02)	3/29/01	x	x	x	x	
36-1	RFI-36-33(08-10)	3/29/01	x	x	x	x	
36-1	RFI-36-33(16-18)	3/29/01	x	x	x	x	
36-1	RFI-36-35(00-02)	3/27/01	x	x	x	x	
36-1	RFI-36-35(08-10)	3/27/01	x	x	x	x	
36-1	RFI-36-35(12-14)	3/27/01	x	x	x	x	
36-1	RFI-36-38(0.5-2.5)	12/16/01	BTEX				
36-1	RFI-36-38(10.5-12.5)	12/16/01	BTEX				
36-1	RFI-36-38(8.5-10.5)	12/16/01	BTEX				
36-1	RFI-36-39(0.5-2.5)	12/16/01	BTEX				
36-1	RFI-36-39(10.5-12.5)	12/16/01	BTEX				
36-1	RFI-36-39(8.5-10.5)	12/16/01	BTEX				
36-1	RFI-36-40(0.5-2.5)	12/16/01	BTEX				
36-1	RFI-36-40(12.5-14.5)	12/16/01	BTEX				
36-1	RFI-36-40(8.5-10.5)	12/16/01	BTEX				
36-1	RFI-36-44(01-03)	1/24/02	x			As	
36-1	RFI-36-44(07-09)	1/24/02	x			As	
36-1	RFI-36-44(09-11)	1/24/02	x			As	
36-1	RFI-36-45(00-02)	1/24/02	x			As	
36-1	RFI-36-45(08-10)	1/24/02	x			As	
36-1	RFI-36-45(10-12)	1/24/02	x			As	
36-1	RFI-36-46(00-02)	1/10/02	x	x	x	x	
36-1	RFI-36-46(08-10)	1/10/02	x	x	x	x	
36-1	RFI-36-46(10-12)	1/10/02	x	x	x	x	
36-1	RFI-36-DUP-02	12/20/00	x	x		x	Duplicate of RFI-36-03(14-16)
36-1	DUP-02	3/26/01	x	x	x	x	Duplicate of RFI-36-24(10-12)
36-1	36-22 (10-12)DUP	3/27/01	x	x	x	x	Duplicate of RFI-36-22(10-12)
36-1	RFI-DUP-01	3/27/01	x	x	x	x	Unknown parent
36-1	DUP-05	3/28/01	x	x	x	x	Duplicate of RFI-36-32(16-18)
36-1	RFI-DUP-03	3/28/01	x	x	x	x	Duplicate of RFI-36-29(10-12)
36-1	DUP-06	3/29/01	x	x	x	x	Duplicate of RFI-36-28(08-10)
36-1	RFI-36-DUP-47	8/21/01	x	x	x	x	Duplicate of RFI-36-01(8.5-10.5)
36-1	RFI-36-DUP-52	8/29/01	x				Duplicate of RFI-36-17(08-10)
36-1	RFI-81-DUP-60	9/17/01	x				Duplicate of RFI-36-02(09-11)
36-1	RFI-36-BTEX-DUP-1	12/16/01	BTEX				Duplicate of RFI-36-38(10.5-12.5)
36-1	RFI-36-DUP1	12/19/01	x	x		x	Duplicate of RFI-36-04(18-20)
36-1	RFI-36-DUP-209	1/10/02	x	x	x	x	Duplicate of RFI-36-46(08-10)
36-2	RFI-36-19(00-02)	8/28/01	x				
36-2	RFI-36-19(08-10)	8/28/01	x				
36-2	RFI-36-19(10-12)	8/28/01	x				
36-2	RFI-36-34(0.9-2.9)	6/28/01	x	x	x	x	
36-2	RFI-36-34(6.9-8.9)	6/28/01	x	x	x	x	
36-2	RFI-36-36(01-03)	6/29/01	x	x	x	x	

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SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
36-2	RFI-36-36(05-07)	6/29/01	x	x	x	x	
36-2	RFI-36-36R(01-03)	11/29/01				Cr(VI,total)	
36-2	RFI-36-37(00-02)	9/4/01	x	x			
36-2	RFI-36-37(06-08)	9/4/01	x	x			
36-2	RFI-36-37(08-10)	9/4/01	x	x	x		
36-2	RFI-36-37(14-16)	9/4/01	x	x			
36-2	RFI-36-41(01-03)	11/29/01				Cr(VI,total)	
36-2	RFI-36-42(0.1-1.5)	11/29/01				Cr(VI,total)	
36-3	RFI-36-08(01-03)	7/17/01	x	x	x	x	
36-3	RFI-36-08(6.5-8.5)	7/17/01	x	x	x	x	
36-3	RFI-36-09(01-03)	7/17/01	x	x	x	x	
36-3	RFI-36-09(05-07)	7/17/01	x	x	x	x	
36-3	RFI-36-10(01-03)	7/18/01	x	x	x	x	
36-3	RFI-36-10(07-09)	7/18/01	x	x	x	x	
36-3	RFI-36-20(00-02)	8/28/01	x	x			
36-3	RFI-36-20(08-10)	8/28/01	x	x			
36-3	RFI-36-20(10-12)	8/28/01	x	x			
36-3	RFI-36-43(0.9-2.9)	12/15/01	x	x	x	x	
36-3	RFI-36-43(10.9-12.9)	12/15/01	x	x	x	x	
36-3	RFI-36-43(6.9-8.9)	12/15/01	x	x	x	x	
36-3	RFI-36-Dup-36	7/17/01	x	x	x	x	Duplicate of RFI-36-09(05-07)
36-4	RFI-36-11(0.8-02)	12/21/00	x	x		x	
36-4	RFI-36-11(08-10)	12/21/00	x	x		x	
36-4	RFI-36-11(10-12)	12/21/00	x	x		x	
36-4	RFI-36-12(0.8-02)	12/20/00	x	x		x	
36-4	RFI-36-12(08-10)	12/20/00	x	x		x	
36-5	RFI-36-13(01-03)	7/27/01	x	x	x	x	
36-5	RFI-36-13(05-07)	7/27/01	x	x	x	x	
36-5	RFI-36-13(09-11)	7/27/01	x	x	x	x	
36-5	RFI-36-14(00-02)	7/16/01	x	x	x	x	
36-5	RFI-36-14(06-08)	7/16/01	x	x	x	x	
55-1	WWTP-1(00-02)	3/15/01	x	x	x	x	
55-1	WWTP-1(02-04)	3/15/01	x	x	x	x	
55-1	WWTP-2(00-02)	3/15/01	x	x	x	x	
55-1	WWTP-2(02-04)	3/15/01	x	x	x	x	
55-1	WWTP-2(08-10)	3/15/01	x	x	x	x	
55-1	WWTP-3(00-02)	3/15/01	x	x	x	x	
55-1	WWTP-3(02-04)	3/15/01	x	x	x	x	
55-1	WWTP-DUP	3/15/01	x	x	x	x	
55-1	RFI-55-01(01-03)	8/3/01	x	x	x	x	
55-1	RFI-55-01(05-07)	8/3/01	x	x	x	x	
55-1	RFI-55-02(01-03)	7/27/01	x	x	x	x	
55-1	RFI-55-02(08-10)	7/27/01	x	x	x	x	
55-1	RFI-55-03(00-02)	7/26/01	x	x	x	x	
55-1	RFI-55-04(00-02)	7/26/01	x	x	x	x	
55-1	RFI-55-04(06-08)	7/26/01	x	x	x	x	
55-1	RFI-55-05(00-02)	7/26/01	x	x	x	x	
55-1	RFI-55-05(08-10)	7/26/01	x	x	x	x	

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SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
55-1	RFI-55-06(00-02)	7/26/01	x	x	x	x	
55-1	RFI-55-09(01-03)	6/27/01	x	x	x	x	
55-1	RFI-55-09(09-11)	6/27/01	x	x	x	x	
55-1	RFI-55-10(01-03)	1/23/02	x	x	x	x	
55-1	RFI-55-10(07-09)	1/23/02	x	x	x	x	
55-1	RFI-55-DUP-35	6/27/01	x	x	x	x	Duplicate of RFI-55-09(09-11)
55-1	RFI-55-Dup-41	7/26/01	x	x	x	x	Duplicate of RFI-55-04(00-02)
10-1	RFI-10-01(0.7-2.5)	7/20/01	x	x	x	x	
10-1	RFI-10-01(01-03)	7/26/01	x	x	x	x	
10-1	RFI-10-01(05-07)	7/26/01	x	x	x	x	
10-1	RFI-10-01(09-11)	7/26/01	x	x	x	x	
10-1	RFI-10-16(1.9-3.9)	12/11/01				Pb	
10-1	RFI-10-16(3.9-5.9)	12/11/01				Pb	
10-1	RFI-10-17(01-03)	11/30/01				Pb	
10-1	RFI-10-17(03-05)	11/30/01				Pb	
10-1	RFI-10-18(1.3-3.3)	11/30/01	x	x	x	x	
10-1	RFI-10-18(3.3-5.3)	11/30/01	x	x	x	x	
10-1	RFI-10-19(02-04)	11/30/01				Pb	
10-1	RFI-10-19(04-06)	11/30/01				Pb	
10-1	RFI-10-27(01-03)	1/15/02	x	x	x	x	
10-1	RFI-10-27(07-09)	1/15/02	x	x	x	x	
10-1	RFI-10-27(09-11)	1/15/02	x	x	x	x	
10-1	RFI-10-Dup-41	7/26/01	x	x	x	x	Duplicate of RFI-10-01(01-03)
10-2	RFI-10-02(0.8-2.8)	6/27/01	x	x	x	x	
10-2	RFI-10-02(6.8-8.8)	6/27/01	x	x	x	x	
10-2	RFI-10-03(0.6-2.6)	6/27/01	x	x	x	x	
10-2	RFI-10-03(6.6-8.6)	6/27/01	x	x	x	x	
10-2	RFI-10-04(03-4.7)	7/19/01	x	x	x	x	
10-2	RFI-10-05(00-02)	8/27/01	x				
10-2	RFI-10-05(08-10)	8/27/01	x				
10-2	RFI-10-05(10-12)	8/27/01	x				
10-2	RFI-10-12(0.8-2.8)	6/27/01	x	x	x	x	
10-2	RFI-10-12(6.8-8.8)	6/27/01	x	x	x	x	
10-2	RFI-10-13(0.7-2.7)	7/24/01	x	x	x	x	
10-2	RFI-10-13(8.7-10.7)	7/24/01	x	x	x	x	
10-2	RFI-10-14(0.9-2.9)	6/27/01	x	x	x	x	
10-2	RFI-10-14(6.9-8.9)	6/27/01	x	x	x	x	
10-2	RFI-10-23(00-02)	11/30/01				Mn	
10-2	RFI-10-24(00-02)	1/23/02	x				
10-2	RFI-10-24(06-08)	1/23/02	x				
10-2	RFI-10-25(00-02)	1/23/02	x				
10-2	RFI-10-25(06-08)	1/23/02	x	x	x	x	
10-2	RFI-10-26(04-06)	1/12/02	x	x	x	x	
10-2	RFI-10-DUP-206	1/23/02	x				Duplicate of RFI-10-24(06-08)
10-2	RFI-10-DUP-51	8/27/01	x				Duplicate of RFI-10-05(08-10)
10-3	20-101R(00-1.2)	11/5/01	x	x	x	x	
10-3	20-101R(07-09)	11/5/01	x	x	x	x	
10-3	20-105R(01-03)	11/21/01	x	x	x	x	

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SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
10-3	20-105R(07-09)	11/21/01	x	x	x	x	
10-3	RFI-10-06(04-06)	7/20/01	x	x	x	x	
10-3	RFI-10-06(06-08)	7/20/01	x	x	x	x	
10-3	RFI-10-07(01-03)	11/9/01	x	x	x	x	
10-3	RFI-10-07(07-09)	11/9/01	x	x	x	x	
10-3	RFI-10-08(00-02)	6/28/01	x	x	x	x	
10-3	RFI-10-08(06-08)	6/28/01	x	x	x	x	
10-3	RFI-10-09(00-02)	6/18/01	x	x	x	x	
10-3	RFI-10-10(00-02)	6/18/01	x	x	x	x	
10-3	RFI-10-15(00-02)	8/27/01	x				
10-3	RFI-10-15(08-10)	8/27/01	x				
10-3	RFI-10-20(00-02)	11/29/01				Mn	
10-3	RFI-10-21(00-02)	11/29/01				Mn	
10-3	RFI-10-22(00-02)	11/29/01				Mn	
10-3	RFI-10-DUP-200	11/9/01	x	x	x	x	Duplicate of RFI-10-07(07-09)
10-3	RFI-10-DUP-202	11/21/01	x	x	x	x	Duplicate of 20-105R(07-09)
10-3	RFI-10-DUP-203	11/29/01				Mn	Duplicate of RFI-10-22(00-02)
10-3	RFI-10-Dup-38	7/20/01	x	x	x	x	Duplicate of RFI-10-06(06-08)
10-4	RFI-10-11(03-05)	7/19/01	x	x	x	x	
05-1	RFI-05-21(00-02)	6/26/01	x	x	x	x	
05-1	RFI-05-21(06-08)	6/26/01	x	x	x	x	
05-1	RFI-05-22(0.5-2.5)	11/26/01				Pb	
05-1	RFI-05-22(04-06)	11/26/01	x	x	x	x	
05-1	RFI-05-23(04-06)	11/26/01	x	x	x	x	
05-1	RFI-05-23(1.3-3.0)	11/26/01				Pb	
05-1	RFI-05-24(01-03)	11/26/01				Pb	
05-1	RFI-05-24(03-05)	11/26/01				Pb	
05-1	RFI-05-25(00-02)	11/30/01	x	x	x	x	
05-2	RFI-05-01(01-03)	6/26/01	x	x	x	x	
05-2	RFI-05-01(07-09)	6/26/01	x	x	x	x	
05-2	RFI-05-02(00-02)	1/26/01	x	x	x	x	
05-2	RFI-05-02(08-10)	1/23/01	x	x		x	
05-2	RFI-05-02(10-12)	1/23/01	x	x		x	
05-2	RFI-DUP-3	1/26/01	x	x		x	Duplicate of RFI-05-02(08-10)
05-3	43-101R(0.5-02)	11/5/01	x	x	x	x	
05-3	43-101R(08-10)	11/5/01	x	x	x	x	
05-3	RFI-05-03(0.6-2.6)	6/26/01	x	x	x	x	
05-3	RFI-05-03(8.6-10.6)	6/26/01	x	x	x	x	
05-3	RFI-05-04(00-02)	1/26/01	x	x		x	
05-3	RFI-05-04(08-10)	1/24/01	x	x		x	
05-3	RFI-05-05(00-02)	1/26/01	x	x		x	
05-3	RFI-05-05(08-10)	1/23/01	x	x	x	x	
05-3	RFI-05-05(10-12)	1/23/01	x	x	x	x	
05-3	RFI-05-06(00-02)	7/25/01	x	x	x	x	
05-3	RFI-05-06(08-10)	7/25/01	x	x	x	x	
05-4	RFI-05-07(00-02)	1/26/01	x	x		x	
05-4	RFI-05-07(08-10)	1/24/01	x	x		x	
05-4	RFI-05-07(10-12)	1/24/01	x	x		x	

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SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
05-5	RFI-05-08(0.7-2.7)	6/27/01	x	x	x	x	
05-5	RFI-05-08(2.7-4.7)	6/27/01	x	x	x	x	
05-5	RFI-05-10(00-02)	1/26/01	x	x	x	x	
05-5	RFI-05-10(08-10)	1/23/01	x	x	x	x	
05-5	RFI-05-10(10-12)	1/23/01	x	x	x	x	
05-5	RFI-05-11(00-02)	1/26/01	x	x	x	x	
05-5	RFI-05-11(08-10)	1/23/01	x	x	x	x	
05-5	RFI-05-11(10-12)	1/23/01	x	x	x	x	
05-5	RFI-05-12(00-02)	1/26/01	x	x	x	x	
05-5	RFI-05-12(08-10)	1/24/01	x	x	x	x	
05-5	RFI-05-12(10-12)	1/24/01	x	x	x	x	
05-5	RFI-05-15(0.9-2.9)	9/8/01	x	x	x	x	
05-5	RFI-05-15(6.9-8.9)	9/8/01	x	x	x	x	
05-5	RFI-05-DUP-34	6/27/01	x	x	x	x	Duplicate of RFI-05-08(2.7-4.7)
05-5	RFI-05-DUP-55	9/8/01	x	x	x	x	Duplicate of RFI-05-15(0.9-2.9)
05-5	RFI-DUP-1	1/23/01	x	x	x	x	Duplicate of RFI-05-10(10-12)
05-6	RFI-05-09(0.2-2.2)	6/27/01	x	x	x	x	
05-6	RFI-05-09(6.2-8.2)	6/27/01	x	x	x	x	
05-6	RFI-05-13(00-02)	1/26/01	x	x	x	x	
05-6	RFI-05-13(08-10)	1/22/01	x	x	x	x	
05-6	RFI-05-13(10-12)	1/22/01	x	x	x	x	
05-6	RFI-05-14(00-02)	1/26/01	x	x	x	x	
05-6	RFI-05-14(08-10)	1/22/01	x	x	x	x	
05-6	RFI-05-14(10-12)	1/22/01	x	x	x	x	
05-6	RFI-05-16(0.8-2.8)	9/8/01	x	x	x	x	
05-6	RFI-05-16(10.8-12.8)	9/8/01	x	x	x	x	
05-6	RFI-05-16(8.8-10.8)	9/8/01	x	x	x	x	
05-6	RFI-05-17(0.9-2.9)	9/8/01	x	x	x	x	
05-6	RFI-05-17(10.9-12.9)	9/8/01	x	x	x	x	
05-6	RFI-05-17(8.9-10.9)	9/8/01	x	x	x	x	
05-6	RFI-05-18(0.9-2.9)	9/8/01	x	x	x	x	
05-6	RFI-05-18(6.9-8.9)	9/8/01	x	x	x	x	
05-6	RFI-05-18(8.9-10.9)	9/8/01	x	x	x	x	
05-6	RFI-05-19S(0.8-2.8)	6/26/01	x	x	x	x	
05-6	RFI-05-19S(6.8-8.8)	6/26/01	x	x	x	x	
05-6	RFI-05-20(0.7-2.7)	6/22/01	x	x	x	x	
05-6	RFI-05-20(6.7-8.6)	6/22/01	x	x	x	x	
05-6	RFI-05-27(07-09)	12/10/01				Pb	
05-6	RFI-05-29(07-09)	12/10/01				Pb	
05-6	RFI-05-30(00-02)	1/10/02	x	x	x	x	
05-6	RFI-05-30(06-08)	1/10/02	x	x	x	x	
05-6	RFI-05-DUP-56	9/8/01	x	x	x	x	Duplicate of RFI-05-17(10.9-12.9)
03-1	RFI-03-01(02-04)	8/2/01	x	x	x	x	
03-1	RFI-03-01(08-10)	8/2/01	x	x	x	x	
03-1	RFI-03-01(10-12)	8/2/01	x	x	x	x	
03-1	RFI-03-02(01-03)	6/25/01	x	x	x	x	
03-1	RFI-03-02(03-05)	6/25/01	x	x	x	x	
03-1	RFI-03-02(05-07)	6/25/01	x	x	x	x	

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SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
03-1	RFI-03-03(00-02)	6/22/01	x	x	x	x	
03-1	RFI-03-04(0.5-2.5)	7/23/01	x	x	x	x	
03-1	RFI-03-04(4.5-6.5)	7/23/01	x	x	x	x	
03-1	RFI-03-05(0.5-2.5)	11/29/01				Mn	
03-1	RFI-03-06(0.5-2.5)	11/29/01				Mn	
03-1	RFI-03-07(01-03)	11/29/01				Mn	
03-1	RFI-03-08(0.5-2.5)	11/29/01				Mn	
03-1	RFI-03-DUP-33	6/25/01	x	x	x	x	Duplicate of RFI-03-02(05-07)
81-1	RFI-81-01(2.5-4.5)	9/9/01	x	x	x	x	
81-1	RFI-81-02(04-06)	9/9/01	x	x	x	x	
81-1	RFI-81-02(08-10)	9/9/01	x	x	x	x	
81-1	RFI-81-02(12-14)	9/9/01	x	x	x	x	
81-1	RFI-81-23(0.9-1.7)	9/7/01	x	x	x	x	
81-1	RFI-81-25(0.8-2.8)	12/3/01				Pb	
81-1	RFI-81-25(8-10)	12/3/01				Pb	
81-1	RFI-81-35(0.8-2.8)	1/22/02	x	x	x	x	
81-1	RFI-81-35(08-10)	1/22/02	x	x	x	x	
81-1	RFI-81-35(12-14)	1/22/02	x	x	x	x	
81-2	RFI-81-03(00-02)	6/21/01	x	x	x	x	
81-2	RFI-81-03(08-10)	6/21/01	x	x	x	x	
81-2	RFI-81-03(10-12)	6/21/01	x	x	x	x	
81-2	RFI-81-04(8-10)	1/25/01	x	x		x	
81-2	RFI-81-05(03-05)	8/4/01	x	x	x	x	
81-2	RFI-81-05(09-11)	8/4/01	x	x	x	x	
81-2	RFI-81-13(00-02)	8/27/01	x	x	x	x	
81-2	RFI-81-13(06-08)	8/27/01	x	x	x	x	
81-2	RFI-81-13(10-12)	8/27/01		x	x	x	
81-2	RFI-81-14(00-02)	6/18/01	x	x	x	x	
81-2	RFI-81-15(00-02)	6/18/01	x	x	x	x	
81-2	RFI-81-16(00-02)	6/18/01	x	x	x	x	
81-2	RFI-81-17(00-02)	6/18/01	x	x	x	x	
81-2	RFI-81-18(00-02)	6/18/01	x	x	x	x	
81-2	RFI-81-19(00-02)	9/17/01	x	x	x	x	
81-2	RFI-81-20(01-03)	8/4/01	x	x	x	x	
81-2	RFI-81-20(03-05)	8/4/01	x	x	x	x	
81-2	RFI-81-20(07-09)	8/4/01	x	x	x	x	
81-2	RFI-81-21(00-02)	9/17/01	x	x	x	x	
81-2	RFI-81-21(08-10)	9/17/01	x	x	x	x	
81-2	RFI-81-22(00-02)	6/21/01	x	x	x	x	
81-2	RFI-81-28(0.5-2.5)	12/11/01				Cr(VI,total)	
81-2	RFI-81-30(1.2-3.2)	12/13/01				Pb, Mn	
81-2	RFI-81-30(3.2-5.2)	12/13/01				Pb, Mn	
81-2	RFI-81-32(01-03)	12/13/01				Pb, Mn	
81-2	RFI-81-32(03-05)	12/13/01				Pb, Mn	
81-2	RFI-81-Dup-50	8/4/01	x	x	x	x	Duplicate of RFI-81-05(03-05)
81-3	RFI-81-06(0.8-2.8)	8/4/01	x	x	x	x	
81-3	RFI-81-06(12.8-14.8)	8/4/01	x	x	x	x	
81-3	RFI-81-06(2.8-4.8)	8/4/01	x	x	x	x	

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GENERAL MOTORS CORPORATION
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RFI PHASE I REPORT

SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
81-3	RFI-81-06(8.8-10.8)	8/4/01	x	x	x	x	
81-3	RFI-81-07(0.3-2.3)	7/27/01	x	x	x	x	
81-3	RFI-81-07(4.3-6.3)	7/27/01	x	x	x	x	
81-3	RFI-81-08(00-02)	6/21/01	x	x	x	x	
81-3	RFI-81-08(06-08)	6/21/01	x	x	x	x	
81-3	RFI-81-11(00-02)	6/20/01	x	x	x	x	
81-3	RFI-81-11(02-04)	6/20/01	x	x	x	x	
81-3	RFI-81-11(04-06)	6/20/01	x	x	x	x	
81-3	RFI-81-33(00-02)	1/18/02	x	x	x	x	
81-3	RFI-81-33(08-10)	1/18/02	x	x	x	x	
81-3	RFI-81-33(10-12)	1/18/02	x	x	x	x	
81-3	RFI-81-DUP-28	6/20/01	x	x	x	x	Duplicate of RFI-81-11(00-02)
81-4	RFI-81-09(00-02)	6/25/01	x	x	x	x	
81-4	RFI-81-09(08-10)	6/25/01	x	x	x	x	
81-4	RFI-81-09(10-12)	6/25/01	x	x	x	x	
81-5	RFI-81-10(0.3-2.3)	6/21/01	x	x	x	x	
81-5	RFI-81-10(10.3-12.3)	6/21/01	x	x	x	x	
81-5	RFI-81-10(8.3-10.3)	6/21/01	x	x	x	x	
21-1	RFI-21-01(0.9-2.9)	6/25/01	x	x	x	x	
21-1	RFI-21-01(6.9-8.9)	6/25/01	x	x	x	x	
21-1	RFI-21-02(0.7-2.7)	6/25/01	x	x	x	x	
21-1	RFI-21-02(6.7-8.7)	6/25/01	x	x	x	x	
21-1	RFI-21-03(01-03)	6/21/01	x	x	x	x	
21-1	RFI-21-03(09-11)	6/21/01	x	x	x	x	
21-1	RFI-21-04(0.7-2.7)	11/6/01	x	x	x	x	
21-1	RFI-21-04(10.7-12.7)	11/6/01	x	x	x	x	
21-1	RFI-21-04(6.7-8.7)	11/6/01	x	x	x	x	
65-1	RFI-65-01(0.7-2.7)	7/27/01	x	x	x	x	
65-1	RFI-65-01(4.7-6.7)	7/27/01	x	x	x	x	
83/84-1	RFI-83/84-01(02-3.7)	6/18/01	x	x	x	x	
83/84-1	RFI-83/84-02(02-04)	6/18/01	x	x	x	x	
83/84-1	RFI-83/84-02(04-06)	6/18/01	x	x	x	x	
83/84-1	RFI-83/84-03(00-02)	1/29/01	x	x		x	
83/84-1	RFI-83/84-03(08-10)	1/29/01	x	x		x	
83/84-1	RFI-83/84-03(10-12)	1/29/01	x	x		x	
83/84-1	RFI-83/84-DUP-26	6/18/01	x	x	x	x	Duplicate of RFI-83/84-02(04-06)
83/84-1	RFI-DUP-5	1/29/01	x	x		x	Duplicate of RFI-83/84-03(10-12)
83/84-2	RFI-83/84-04(00-02)	1/29/01	x	x		x	
83/84-2	RFI-83/84-04(08-10)	1/29/01	x	x		x	
83/84-2	RFI-83/84-04(12-14)	1/29/01	x	x		x	
83/84-2	RFI-83/84-06(01-03)	9/12/01	x	x	x	x	
83/84-2	RFI-83/84-06(07-09)	9/12/01	x	x	x	x	
83/84-2	RFI-83/84-06(09-11)	9/12/01	x	x	x	x	
83/84-2	RFI-83/84-12(0.7-2.7)	12/7/01	x	x	x	x	
83/84-2	RFI-83/84-12(2.7-4.7)	12/7/01	x	x	x	x	
83/84-2	RFI-83/84-13(1.1-3.1)	12/7/01				Pb	
83/84-2	RFI-83/84-13(3.1-5.1)	12/7/01				Pb	
83/84-2	RFI-83/84-14(0.8-1.0)	12/10/01				Pb	

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SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
83/84-2	RFI-83/84-15(1.2-3.0)	12/10/01				Pb	
83/84-2	RFI-83/84-21(0.7-2.7)	12/7/01	x	x	x	x	
83/84-2	RFI-83/84-21(6.7-8.7)	12/7/01	x	x	x	x	
83/84-2	RFI-83/84-22(1.1-3.1)	12/7/01	x	x	x	x	
83/84-2	RFI-83/84-22(3.1-5.1)	12/7/01	x	x	x	x	
83/84-2	RFI-83/84-22(7.1-9.1)	12/7/01	x	x	x	x	
83/84-2	RFI-83/84-23(01-03)	12/7/01	x	x	x	x	
83/84-2	RFI-83/84-23(05-07)	12/7/01	x	x	x	x	
83/84-2	RFI-83/84-24(0.8-2.8)	12/7/01	x	x	x	x	
83/84-2	RFI-83/84-24(4.8-6.8)	12/7/01	x	x	x	x	
83/84-2	RFI-83/84-24(6.8-8.8)	12/7/01	x	x	x	x	
83/84-2	RFI-83/84-25(0.7-2.7)	12/5/01	x	x	x	x	
83/84-2	RFI-83/84-25(10.7-12.7)	12/5/01	x	x	x	x	
83/84-2	RFI-83/84-25(8.7-10.7)	12/5/01	x	x	x	x	
83/84-2	RFI-83/84-27(0.7-2.7)	12/13/01	x	x	x	x	
83/84-2	RFI-83/84-27(6.7-8.7)	12/13/01	x	x	x	x	
83/84-2	RFI-83/84-27(8.7-10.7)	12/13/01	x	x	x	x	
83/84-2	RFI-83/84-28(0.7-2.7)	12/13/01	x	x	x	x	
83/84-2	RFI-83/84-28(2.7-4.7)	12/13/01	x	x	x	x	
83/84-2	RFI-83/84-29(01-03)	1/17/02	x	x	x	x	
83/84-2	RFI-83/84-29(09-11)	1/17/02	x	x	x	x	
83/84-2	RFI-83/84-DUP-205	12/7/01	x	x	x	x	Duplicate of RFI-83/84-24(0.8-2.8)
83/84-2	RFI-83/84-DUP-206	12/7/01	x	x	x	x	Duplicate of RFI-83/84-23(01-03)
83/84-2	RFI-83/84-DUP-207	12/10/01				Pb	Duplicate of RFI-83/84-16(0.8-2.8)
83/84-2	RFI-83/84-DUP-208	12/13/01	x	x	x	x	Duplicate of RFI-83/84-27(8.7-10.7)
83/84-3	RFI-83/84-05(0.7-2.7)	7/24/01	x	x	x	x	
83/84-3	RFI-83/84-05(6.7-8.7)	7/24/01	x	x	x	x	
83/84-3	RFI-83/84-16(0.8-2.8)	12/10/01				Pb	
83/84-3	RFI-83/84-16(2.8-4.8)	12/10/01				Pb	
83/84-3	RFI-83/84-18(0.8-2.8)	12/10/01				Pb	
83/84-3	RFI-83/84-18(2.8-4.8)	12/10/01				Pb	
83/84-3	RFI-83/84-19(0.8-2.8)	12/10/01				Pb	
83/84-3	RFI-83/84-19(2.8-3.4)	12/10/01				Pb	
83/84-4	RFI-83/84-07(0.9-2.9)	7/25/01	x	x	x	x	
83/84-4	RFI-83/84-07(8.9-10.9)	7/25/01	x	x	x	x	
83/84-4	RFI-83/84-08(0.7-2.7)	7/24/01	x	x	x	x	
83/84-4	RFI-83/84-08(8.7-10.7)	7/24/01	x	x	x	x	
83/84-4	RFI-83/84-26(0.8-2.8)	12/7/01	x	x	x	x	
83/84-4	RFI-83/84-26(6.8-8.8)	12/7/01	x	x	x	x	
83/84-5	RFI-83/84-09(0.8-2.8)	7/23/01	x	x	x	x	
83/84-5	RFI-83/84-09(6.8-8.8)	7/23/01	x	x	x	x	
83/84-6	RFI-83/84-10(00-02)	1/29/01	x	x		x	
83/84-6	RFI-83/84-10(08-10)	1/29/01	x	x		x	
83/84-6	RFI-83/84-10(10-12)	1/29/01	x	x		x	
83/84-6	RFI-DUP4	1/29/01	x	x		x	Duplicate of RFI-83/84-10(10-12)
83/84-7	RFI-83/84-11(00-02)	6/25/01	x	x	x	x	
83/84-7	RFI-83/84-11(04-06)	6/25/01	x	x	x	x	
85-1	RFI-85-02(1.3-3.3)	6/22/01	x	x	x	x	

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SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
85-1	RFI-85-02(7.3-9.3)	6/22/01	x	x	x	x	
85-1	RFI-85-02(9.3-11.3)	6/22/01	x	x	x	x	
85-1	RFI-85-03(01-03)	6/20/01	x	x	x	x	
85-1	RFI-85-03(05-07)	6/20/01	x	x	x	x	
85-1	RFI-85-04(0.5-2.5)	7/30/01	x	x	x	x	
85-1	RFI-85-04(12.5-14.5)	7/30/01	x	x	x	x	
85-1	RFI-85-04(8.5-10.5)	7/30/01	x	x	x	x	
85-1	RFI-85-05(01-03)	7/24/01	x	x	x	x	
85-1	RFI-85-05(05-07)	7/24/01	x	x	x	x	
85-1	RFI-85-05(09-11)	7/24/01	x	x	x	x	
85-1	RFI-85-05(17-19)	7/24/01	x	x	x	x	
85-1	RFI-85-06(0.7-2.7)	6/22/01	x	x	x	x	
85-1	RFI-85-06(8.7-10.7)	6/22/01	x	x	x	x	
85-1	RFI-85-06(10.7-12.7)	6/22/01	x	x	x	x	
85-1	RFI-85-07(0.5-2.5)	11/7/01	x	x	x	x	
85-1	RFI-85-07(08-10)	11/7/01	x	x	x	x	
85-1	RFI-85-07(11-13)	11/7/01	x	x	x	x	
85-1	RFI-85-Dup-40	7/24/01	x	x	x	x	Duplicate of RFI-85-05(01-03)
85-1	RFI-85-Dup-42	7/30/01	x	x	x	x	Duplicate of RFI-85-04(8.5-10.5)
86-1	RFI-02-08(0.7-02)	5/21/01	x	x	x	x	
86-1	RFI-02-08(04-06)	5/21/01	x	x	x	x	
86-1	RFI-86-01(0.5-2.5)	5/23/01	x	x	x	x	
86-1	RFI-86-01(4.5-6.5)	5/23/01	x	x	x	x	
86-1	RFI-86-01(8.5-10.5)	5/23/01	x	x	x	x	
86-1	RFI-86-02(01-03)	7/31/01	x	x	x	x	
86-1	RFI-86-02(07-09)	7/31/01	x	x	x	x	
86-1	RFI-86-03(02-04)	6/20/01	x	x	x	x	
86-1	RFI-86-03(04-06)	6/20/01	x	x	x	x	
86-1	RFI-86-04(01-03)	7/24/01	x	x	x	x	
86-1	RFI-86-04(03-05)	7/24/01	x	x	x	x	
86-1	RFI-86-05(01-03)	6/20/01	x	x	x	x	
86-1	RFI-86-05(03-05)	6/20/01	x	x	x	x	
86-1	RFI-86-05(05-07)	6/20/01	x	x	x	x	
86-1	RFI-86-06D(02-04)	6/15/01	x	x	x	x	
86-1	RFI-86-06D(06-08)	6/15/01	x	x	x	x	
86-1	RFI-86-07(0.7-2.7)	5/23/01	x	x	x	x	
86-1	RFI-86-07(8.7-10.7)	5/23/01	x	x	x	x	
86-1	RFI-86-08(0.6-2.6)	7/20/01	x	x	x	x	
86-1	RFI-86-08(10.6-12.6)	7/20/01	x	x	x	x	
86-1	RFI-86-08(8.6-10.6)	7/20/01	x	x	x	x	
86-1	RFI-86-10(6.5-8.5)	11/21/01				Mn	
86-1	RFI-86-11(0.7-2.7)	11/21/01				As	
86-1	RFI-86-11(2.7-4.7)	11/21/01				As	
86-1	RFI-86-12(0.8-2.8)	11/21/01				As	
86-1	RFI-86-12(2.8-4.8)	11/21/01				As	
86-1	RFI-86-13(0.8-2.8)	11/21/01				As	
86-1	RFI-86-13(2.8-4.8)	11/21/01				As	
86-1	RFI-86-14(0.5-2.5)	1/9/02	x	x	x	x	

TABLE 2-3

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SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
86-1	RFI-86-14(4.5-6.5)	1/9/02	x	x	x	x	
86-1	RFI-86-15(0.3-2.3)	1/14/02	x	x	x	x	
86-1	RFI-86-DUP-14	5/23/01	x	x	x	x	Duplicate of RFI-86-07(0.7-2.7)
86-1	RFI-86-DUP-15S	5/23/01	x	x	x	x	Duplicate of RFI-86-01(8.5-10.5)
86-1	RFI-86-Dup-43	7/31/01	x	x	x	x	Duplicate of RFI-86-02(07-09)
07-1	RFI-07-01(0.3-2.3)	6/13/01	x	x	x	x	
07-1	RFI-07-01(2.3-4.3)	6/13/01	x	x	x	x	
07-1	RFI-07-02(0.8-2.8)	6/13/01	x	x	x	x	
07-1	RFI-07-02(2.8-4.8)	6/13/01	x	x	x	x	
07-1	RFI-07-03(00-02)	6/14/01	x	x	x	x	
07-1	RFI-07-04(00-02)	6/14/01	x	x	x	x	
07-1	RFI-07-04(04-06)	6/14/01	x	x	x	x	
07-1	RFI-07-09(00-02)	6/14/01	x	x	x	x	
07-2	RFI-07-05(01-03)	6/14/01	x	x	x	x	
07-2	RFI-07-05(05-07)	6/14/01	x	x	x	x	
07-2	RFI-07-05(09-11)	6/14/01	x	x	x	x	
07-2	RFI-07-DUP-25	6/14/01	x	x	x	x	Duplicate of RFI-07-05(05-07)
07-3	RFI-07-06(0.5-2.5)	7/20/01	x	x	x	x	
07-3	RFI-07-06(6.5-8.5)	7/20/01	x	x	x	x	
07-3	RFI-07-07(0.5-2.5)	7/20/01	x	x	x	x	
07-3	RFI-07-07(14.5-16.5)	7/20/01	x	x	x	x	
07-3	RFI-07-07(8.5-10.5)	7/20/01	x	x	x	x	
07-3	RFI-07-08(00-02)	7/30/01	x	x	x	x	
07-3	RFI-07-08(08-10)	7/30/01	x	x	x	x	
07-3	RFI-07-08(10-12)	7/30/01	x	x	x	x	
94-A	RFI-94-01(0.5-02)	5/16/01	x	x	x	x	
94-A	RFI-94-01(02-04)	5/16/01	x	x	x	x	
94-B	RFI-94-02(00-02)	8/30/01	x	x	x	x	
94-B	RFI-94-02(08-10)	8/30/01	x	x	x	x	
94-B	RFI-94-02(12-14)	8/30/01	x	x	x	x	
94-C	RFI-94-03(0.8-02)	5/8/01	x	x	x	x	
94-C	RFI-94-03(02-04)	5/8/01	x	x	x	x	
94-C	RFI-94-04(0.4-02)	5/8/01	x	x	x	x	
94-C	RFI-94-04(08-10)	5/8/01	x	x	x	x	
94-C	RFI-94-DUP-02	5/8/01	x	x	x	x	Duplicate of RFI-94-04(0.4-02)
94-D	RFI-94-05(0.5-02)	5/9/01	x	x	x	x	
94-D	RFI-94-05(08-10)	5/9/01	x	x	x	x	
94-D	RFI-94-05(18-20)	5/9/01	x	x	x	x	
94-D	RFI-94 Dup-4	5/9/01	x	x	x	x	Duplicate of RFI-94-05(18-20)
94-E	RFI-94-06(0.7-02)	5/9/01	x	x	x	x	
94-E	RFI-94-06(08-10)	5/9/01	x	x	x	x	
94-E	RFI-94-DUP-03	5/9/01	x	x	x	x	Duplicate of RFI-94-06(08-10)
84-A	RFI-84-01(0.5-02)	5/7/01	x	x	x	x	
84-A	RFI-84-01(08-10)	5/7/01	x	x	x	x	
84-A	RFI-84-01(16-17.5)	5/7/01	x	x	x	x	
84-A	RFI-84-02(0.8-02)	5/7/01	x	x	x	x	
84-A	RFI-84-02(08-10)	5/7/01	x	x	x	x	
84-A	RFI-84-06(0.9-02)	5/21/01	x	x	x	x	

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GENERAL MOTORS CORPORATION
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SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
84-A	RFI-84-06(04-06)	5/21/01	x	x	x	x	
84-B	RFI-84-03(0.8-02)	5/8/01	x	x	x	x	
84-B	RFI-84-03(08-10)	5/8/01	x	x	x	x	
84-B	RFI-84-03(12-14)	5/8/01	x	x	x	x	
84-C	RFI-84-04(0.8-02)	5/8/01	x	x	x	x	
84-C	RFI-84-04(08-10)	5/8/01	x	x	x	x	
84-C	RFI-84-04(12-14)	5/8/01	x	x	x	x	
84-D	RFI-84-05(0.8-2.8)	5/24/01	x	x	x	x	
84-D	RFI-84-05(6.8-8.8)	5/24/01	x	x	x	x	
17-A	RFI-17-01(0.7-02)	5/16/01	x	x	x	x	
17-A	RFI-17-01(02-04)	5/16/01	x	x	x	x	
17-A	RFI-17-02(0.3-02)	5/14/01	x	x	x	x	
17-A	RFI-17-02(04-06)	5/14/01	x	x	x	x	
02-A	RFI-02-01(01-02)	5/9/01	x	x	x	x	
02-A	RFI-02-01(08-10)	5/9/01	x	x	x	x	
02-B	RFI-02-02(0.5-02)	5/9/01	x	x	x	x	
02-B	RFI-02-02(08-10)	5/9/01	x	x	x	x	
02-C	RFI-02-03(0.9-02)	5/9/01	x	x	x	x	
02-C	RFI-02-03(08-10)	5/9/01	x	x	x	x	
02-C	RFI-02-09(1.7-3.7)	9/7/01				Pb	
02-C	RFI-02-10(1.3-3.3)	9/7/01				Pb	
02-C	RFI-02-11(1.7-3.7)	9/7/01				Pb	
02-D	RFI-02-04(06-08)	5/10/01	x	x	x	x	
02-D	RFI-02-04(08-10)	5/10/01	x	x	x	x	
02-D	RFI-02-04(1.1-02)	5/10/01	x	x	x	x	
02-E	RFI-02-05(0.7-02)	5/18/01	x	x	x	x	
02-E	RFI-02-05(02-04)	5/18/01	x	x	x	x	
02-F	RFI-02-06(0.7-02)	5/10/01	x	x	x	x	
02-F	RFI-02-06(02-04)	5/10/01	x	x	x	x	
02-F	RFI-02-06(08-10)	5/11/01	x	x	x	x	
02-F	RFI-02-06(10-12)	5/11/01	x	x	x	x	
02-F	RFI-02-07(0.9-02)	5/18/01	x	x	x	x	
02-F	RFI-02-07(04-06)	5/18/01	x	x	x	x	
02-F	RFI-02-07(06-08)	5/18/01	x	x	x	x	
02-F	RFI-02-DUP-05	5/11/01	x	x	x	x	Duplicate of RFI-02-06(10-12)
02-F	RFI-02-DUP-13	5/18/01	x	x	x	x	Duplicate of RFI-02-07(04-06)
23-A	RFI-23-01(00-02)	5/22/01	x	x	x	x	
23-A	RFI-23-01(02-04)	5/22/01	x	x	x	x	
23-A	RFI-23-02(03-3.8)	5/22/01	x	x	x	x	
29-A	RFI-29-01(0.6-02)	5/15/01	x	x	x	x	
29-A	RFI-29-01(02-04)	5/15/01	x	x	x	x	
29-A	RFI-29-02(01-03)	9/5/01				Pb	
29-A	RFI-29-03(01-03)	9/5/01				Pb	
12-A	RFI-12-01(06-08)	5/15/01	x	x	x	x	
12-A	RFI-12-01(1.2-02)	5/15/01	x	x	x	x	
12-A	RFI-12-02(0.7-02)	5/15/01	x	x	x	x	
12-A	RFI-12-02(06-08)	5/15/01	x	x	x	x	
12-A	RFI-12-02(08-10)	5/15/01	x	x	x	x	

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SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
12-A	RFI-12-02(14-16)	5/15/01	x	x	x	x	
12-A	RFI-12-03(00-02)	5/23/01	x	x	x	x	
12-A	RFI-12-03(04-5.1)	5/23/01	x	x	x	x	
12-A	RFI-12-07(0.9-02)	5/10/01	x	x	x	x	
12-A	RFI-12-07(08-10)	5/10/01	x	x	x	x	
12-A	RFI-12-07(12-14)	5/10/01	x	x	x	x	
12-A	RFI-12-08(0.9-02)	5/11/01	x	x	x	x	
12-A	RFI-12-08(06-08)	5/11/01	x	x	x	x	
12-A	RFI-12-08(08-10)	5/11/01	x	x	x	x	
12-A	RFI-12-08(16-18)	5/11/01	x	x	x	x	
12-A	RFI-12-10(04-06)	5/25/01	x	x	x	x	
12-A	RFI-12-10(06-08)	5/25/01	x	x	x	x	
12-A	RFI-12-15(01-03)	6/8/01	x	x	x	x	
12-A	RFI-12-16(01-03)	9/10/01				Pb	
12-A	RFI-12-16(06-08)	9/10/01				Pb	
12-A	RFI-12-16(08-10)	9/10/01				Pb	
12-A	RFI-12-17(01-03)	9/7/01				Pb	
12-A	RFI-12-17(06-08)	9/10/01				Pb	
12-A	RFI-12-17(08-10)	9/10/01				Pb	
12-A	RFI-12-18(01-03)	9/10/01				Pb	
12-A	RFI-12-18(06-08)	9/10/01				Pb	
12-A	RFI-12-18(08-10)	9/10/01				Pb	
12-A	RFI-12-21(01-03)	11/28/01	x	x	x	x	
12-A	RFI-12-21(09-11)	11/28/01	x	x	x	x	
12-A	RFI-12-22(1.1-3.1)	1/30/02	x	x	x	x	
12-A	RFI-12-22(13.1-15.1)	1/30/02	x	x	x	x	
12-A	RFI-12-22(9.1-11.1)	1/30/02	x	x	x	x	
12-A	RFI-12-DUP-11	5/15/01	x	x	x	x	Duplicate of RFI-12-02(08-10)
12-A	RFI-12-DUP-12	5/15/01	x	x	x	x	Duplicate of RFI-12-02(06-08)
12-A	RFI-12-DUP-57	9/10/01				Pb	Duplicate of RFI-12-16(01-03)
12-B	RFI-12-05(02-04)	5/15/01	x	x	x	x	
12-B	RFI-12-11D(1.1-3.1)	6/5/01	x	x	x	x	
12-B	RFI-12-11D(5.1-7.1)	6/5/01	x	x	x	x	
12-B	RFI-12-14(07-09)	6/7/01	x	x	x	x	
12-B	RFI-12-14(09-11)	6/7/01	x	x	x	x	
12-C	RFI-12-06(1.2-3.2)	5/24/01	x	x	x	x	
12-C	RFI-12-06(7.2-9.2)	5/24/01	x	x	x	x	
12-D	RFI-12-04(00-02)	5/15/01	x	x	x	x	
12-D	RFI-12-04(08-10)	5/15/01	x	x	x	x	
04-A	RFI-04-01(01-03)	6/4/01	x	x	x	x	
04-A	RFI-04-01(09-11)	6/4/01	x	x	x	x	
04-B	RFI-04-02(0.7-2.7)	6/4/01	x	x	x	x	
04-B	RFI-04-02(8.7-10.7)	6/4/01	x	x	x	x	
04-B	RFI-04-03(0.8-2.8)	6/1/01	x	x	x	x	
04-B	RFI-04-03(07-09)	6/4/01	x	x	x	x	
04-B	RFI-04-03(09-11)	6/4/01	x	x	x	x	
04-B	RFI-04-DUP-18	6/4/01	x	x	x	x	Duplicate of RFI-04-03(07-09)
04-C	RFI-04-04(1.3-2.1)	6/1/01	x	x	x	x	

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SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
04-C	RFI-04-04(3.1-5.1)	6/1/01	x	x	x	x	
04-C	RFI-04-04(5.1-7.1)	6/1/01	x	x	x	x	
04-C	RFI-04-DUP-17	6/1/01	x	x	x	x	Duplicate of RFI-04-04(5.1-7.1)
16-A	RFI-16-01(01-03)	5/31/01	x	x	x	x	
16-A	RFI-16-01(05-07)	5/31/01	x	x	x	x	
16-A	RFI-16-01(08-10)	5/31/01	x	x	x	x	
16-B	RFI-16-02(0.4-02)	5/14/01	x	x	x	x	
16-B	RFI-16-02(08-10)	5/14/01	x	x	x	x	
16-B	RFI-16-02(14-16)	5/15/01	x	x	x	x	
16-C	RFI-16-03(0.5-02)	5/15/01	x	x	x	x	
16-C	RFI-16-03(04-06)	5/15/01	x	x	x	x	
16-C	RFI-16-03(04-06)DUP	5/15/01	x	x	x	x	
16-C	RFI-16-04(0.7-02)	5/15/01	x	x	x	x	
16-C	RFI-16-04(04-06)	5/15/01	x	x	x	x	
16-C	RFI-16-05(0.5-02)	5/15/01	x	x	x	x	
16-C	RFI-16-05(02-04)	5/15/01	x	x	x	x	
16-C	RFI-16-07(0.5-2.5)	6/6/01	x	x	x	x	
16-C	RFI-16-07(4.5-6.5)	6/6/01	x	x	x	x	
16-C	RFI-16-08(1.5-3.5)	6/7/01	x	x	x	x	
16-C	RFI-16-08(7.5-9.5)	6/7/01	x	x	x	x	
16-C	RFI-16-09(0.7-2.7)	6/7/01	x	x	x	x	
16-C	RFI-16-09(4.7-6.6)	6/7/01	x	x	x	x	
16-C	RFI-16-10(1.2-3.2)	6/8/01	x	x	x	x	
16-C	RFI-16-10(3.2-5.2)	6/8/01	x	x	x	x	
16-C	RFI-16-11(01-03)	6/12/01	x	x	x	x	
16-C	RFI-16-11(05-07)	6/12/01	x	x	x	x	
16-C	RFI-16-12(0.9-2.9)	1/31/01	x	x	x	x	
16-C	RFI-16-12(8.9-10.9)	1/31/01	x	x	x	x	
16-C	RFI-16-13(01-03)	12/4/01	x	x	x	x	
16-C	RFI-16-13(09-11)	12/4/01	x	x	x	x	
16-C	RFI-16-20(01-03)	12/4/01	x	x	x	x	
16-C	RFI-16-20(04-06)	12/4/01	x	x	x	x	
16-C	RFI-16-DUP-19	6/6/01	x	x	x	x	Duplicate of RFI-16-07(4.5-6.5)
16-C	RFI-16-DUP-20	6/7/01	x	x	x	x	Duplicate of RFI-16-09(4.7-6.6)
16-D	RFI-16-06(0.7-02)	5/14/01	x	x	x	x	
16-D	RFI-16-06(04-06)	5/14/01	x	x	x	x	
16-D	RFI-16-DUP-06	5/14/01	x	x	x	x	
40-A	40-4R(01-03)	11/13/01	x	x	x	x	
40-A	40-4R(08-10)	11/13/01	x	x	x	x	
40-A	40-4R(13-15)	11/13/01	x	x	x	x	
40-A	40-4R(15-17)	11/13/01	x	x	x	x	
40-A	40-7R(00-02)	11/20/01	x	x	x	x	
40-A	40-7R(02-04)	11/20/01	x	x	x	x	
40-A	40-7R(08-10)	11/20/01	x	x	x	x	
40-A	40-7R(12-14)	11/20/01	x	x	x	x	
40-A	RFI-40-01(0.3-2.3)	5/24/01	x	x	x	x	
40-A	RFI-40-05(0.8-2.8)	1/17/02	x	x	x	x	
40-A	RFI-40-05(8.8-10.8)	1/17/02	x	x	x	x	

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SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
40-A	RFI-40-05(10.8-12.8)	1/17/02	x	x	x	x	
40-A	RFI-40-06(01-03)	1/17/02	x	x	x	x	
40-A	RFI-40-06(09-11)	1/17/02	x	x	x	x	
40-A	RFI-40-06(11-13)	1/17/02	x	x	x	x	
40-A	RFI-40-06(15-17)	1/17/02	x	x	x	x	
40-A	RFI-40-07(0.7-2.7)	1/18/01	x	x	x	x	
40-A	RFI-40-07(8.7-10.7)	1/18/01	x	x	x	x	
40-A	RFI-40-08(01-03)	1/24/01	x	x	x	x	
40-A	RFI-40-08(09-11)	1/24/01	x	x	x	x	
40-A	RFI-40-08(13-15)	1/25/01	x	x	x	x	
40-A	RFI-40-09(0.7-2.7)	1/25/01	x	x	x	x	
40-A	RFI-40-09(8.7-10.7)	1/25/01	x	x	x	x	
40-A	RFI-40-DUP-201	11/13/01	x	x	x	x	Duplicate of 40-4R(01-03)
40-A	RFI-40-DUP-204	1/18/02	x	x	x	x	Duplicate of RFI-40-07(0.7-2.7)
40-B	RFI-40-02(0.9-2.9)	1/25/02	x	x	x	x	
40-B	RFI-40-02(8.9-10.9)	1/25/02	x	x	x	x	
40-B	RFI-40-10(0.7-2.7)	1/30/02	x	x	x	x	
40-B	RFI-40-10(4.7-6.7)	1/30/02	x	x	x	x	
40-C	RFI-40-03(0.7-2.7)	1/30/02	x	x	x	x	
40-C	RFI-40-03(6.7-8.7)	1/30/02	x	x	x	x	
40-C	RFI-40-DUP-207	1/30/02	x	x	x	x	
40-D	40-303R(01-03)	11/12/01	x	x	x	x	
40-D	40-303R(08-10)	11/12/01	x	x	x	x	
40-D	40-303R(27-29)	11/12/01	x	x	x	x	
40-D	RFI-40-04(0.5-2.5)	1/16/02	x	x	x	x	
40-D	RFI-40-04(22.5-24.5)	1/16/02	x	x	x	x	
40-D	RFI-40-04(8.5-10.5)	1/16/02	x	x	x	x	
44-A	RFI-44-01(0.7-02)	5/17/01	x	x	x	x	
44-A	RFI-44-01(04-06)	5/17/01	x	x	x	x	
44-A	RFI-44-02(0.7-02)	5/17/01	x	x	x	x	
44-A	RFI-44-02(02-04)	5/17/01	x	x	x	x	
44-A	RFI-44-02(04-06)	5/17/01	x	x	x	x	
44-A	RFI-44-03(0.9-02)	5/17/01	x	x	x	x	
44-A	RFI-44-03(06-08)	5/17/01	x	x	x	x	
44-A	RFI-44-04(0.9-02)	5/16/01	x	x	x	x	
44-A	RFI-44-04(02-04)	5/16/01	x	x	x	x	
44-A	RFI-44-05(0.9-02)	5/16/01	x	x	x	x	
44-A	RFI-44-05(02-04)	5/16/01	x	x	x	x	
44-A	RFI-44-05(08-10)	5/16/01	x	x	x	x	
44-A	RFI-44-05(10-12)	5/16/01	x	x	x	x	
44-A	RFI-44-06(1.3-3.3)	9/5/01	x	x	x	x	
44-A	RFI-44-06(5.3-7.3)	9/5/01	x	x	x	x	
44-A	RFI-44-06(7.3-9.3)	9/5/01	x	x	x	x	
44-A	RFI-44-07(0.7-2.7)	9/5/01				Mn	
44-A	RFI-44-09(02-3.5)	9/5/01				Mn	
44-A	RFI-44-09(0.9-2.9)	11/21/01				Mn	
44-A	RFI-44-DUP-12	5/17/01	x	x	x	x	Duplicate of RFI-44-01(04-06)
44-A	RFI-44-DUP-14	5/16/01	x	x	x	x	Duplicate of RFI-44-05(08-10)

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SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
09-A	RFI-09-01(01-03)	5/29/01	x	x	x	x	
09-A	RFI-09-02(0.4-02)	5/16/01	x	x	x	x	
09-A	RFI-09-02(02-04)	5/16/01	x	x	x	x	
09-A	RFI-09-03(0.4-02)	5/16/01	x	x	x	x	
09-A	RFI-09-03(02-04)	5/16/01	x	x	x	x	
09-A	RFI-09-04(00-02)	5/30/01	x	x	x	x	
09-A	RFI-09-04(02-04)	5/30/01	x	x	x	x	
09-A	RFI-09-15(0.5-1.5)	9/4/01	x	x	x	Pb	
09-A	RFI-09-15(1.9-3.9)	9/4/01	x	x	x	Pb	
09-A	RFI-09-16(01-03)	9/4/01			x	Pb	
09-A	RFI-09-18(01-03)	9/4/01			x	Pb	
09-A	RFI-09-19(0.5-2.5)	9/4/01		x			
09-A	RFI-09-20(0.5-2.5)	9/4/01		x			
09-A	RFI-09-21(0.5-2.5)	9/4/01		x			
09-A	RFI-09-22(00-02)	9/4/01				Mn	
09-A	RFI-09-22(02-04)	9/4/01				Mn	
09-A	RFI-09-23(00-02)	9/4/01				Mn	
09-A	RFI-09-23(02-04)	9/4/01	x	x	x	Mn	
09-A	RFI-09-24(00-02)	9/4/01				Mn	
09-A	RFI-09-24(02-04)	9/4/01				Mn	
09-A	RFI-09-25(00-02)	9/4/01				Mn	
09-A	RFI-09-25(02-04)	9/4/01				Mn	
09-A	RFI-09-DUP-53	9/4/01				Mn	Duplicate of RFI-09-24(02-04)
09-A	RFI-09-DUP-59	9/13/01	x			Ba, Pb	Duplicate of RFI-09-14(02-04)
09-B	RFI-09-05(0.5-02)	5/16/01	x	x	x	x	
09-B	RFI-09-05(06-08)	5/16/01	x	x	x	x	
09-B	RFI-09-06(0.5-2.5)	5/30/01	x	x	x	x	
09-B	RFI-09-06(2.5-4.5)	5/30/01	x	x	x	x	
09-B	RFI-09-07(01-03)	5/29/01	x	x	x	x	
09-B	RFI-09-07(03-05)	5/29/01	x	x	x	x	
09-B	RFI-09-08(01-03)	5/29/01	x	x	x	x	
09-B	RFI-09-08(05-07)	5/29/01	x	x	x	x	
09-B	RFI-09-09(0.7-2.7)	5/29/01	x	x	x	x	
09-B	RFI-09-09(4.7-6.7)	5/29/01	x	x	x	x	
09-B	RFI-09-10(0.8-02)	6/15/01	x	x	x	x	
09-B	RFI-09-11(0.5-2.5)	6/11/01	x	x	x	x	
09-B	RFI-09-11(2.5-4.5)	6/11/01	x	x	x	x	
09-B	RFI-09-12(0.6-2.6)	6/11/01	x	x	x	x	
09-B	RFI-09-12(06-08)	6/11/01	x	x	x	x	
09-B	RFI-09-13(00-02)	9/13/01	x			Ba, Pb	
09-B	RFI-09-13(04-06)	9/13/01	x			Ba, Pb	
09-B	RFI-09-13(06-08)	9/13/01	x			Ba, Pb	
09-B	RFI-09-14(00-02)	9/13/01	x			Ba, Pb	
09-B	RFI-09-14(02-04)	9/13/01	x			Ba, Pb	
09-B	RFI-09-14(06-08)	9/13/01	x			Ba, Pb	
09-B	RFI-09-26(0.7-2.7)	9/5/01			x		
09-B	RFI-09-27(0.7-2.7)	9/4/01			x		
09-B	RFI-09-28(0.5-2.5)	9/5/01	x	x	x		

TABLE 2-3

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
09-B	RFI-09-29(0.3-1.7)	9/5/01			x		
09-B	RFI-09-DUP-13	5/16/01	x	x	x	x	Duplicate of RFI-09-05(0.5-02)
09-B	RFI-09-DUP-16	5/29/01	x	x	x	x	Duplicate of RFI-09-07(03-05)
09-B	RFI-09-DUP-22	6/11/01	x	x	x	x	Duplicate of RFI-09-12(06-08)
ACSP	ACSP-B1(14-16)	10/26/00	x			x	
ACSP	ACSP-B2(14-16)	10/26/00	x	x		x	
ACSP	ACSP-B3(10-12)	10/26/00	x	x		x	
ACSP	ACSP-B4(8-10)	10/26/00	x			x	
ACSP	ACSP-B5(12-14)	10/27/00	x			x	
ACSP	ACSP-B6(2-4)	10/27/00	x			x	
ACSP	ACSP-B2A(00-02)	5/8/01			x		
ACSP	ACSP-B2A(02-04)	5/8/01			x		
ACSP	ACSP-B2A(04-06)	5/8/01			x		
ACSP	ACSP-B2A(06-08)	5/8/01			x		
ACSP	ACSP-B2A(08-10)	5/8/01			x		
ACSP	ACSP-B2A(10-12)	5/9/01	x	x			
ACSP	ACSP-B2B(12-14)	5/9/01	x	x			
ACSP	ACSP-B2C(08-10)	5/9/01	x	x			
ACSP	ACSP-B2D(00-02)	8/17/01	x	x			
ACSP	ACSP-B2D(02-04)	8/17/01	x	x			
ACSP	ACSP-B2D(04-06)	8/17/01	x	x			
ACSP	ACSP-B2D(14-16)	8/17/01	x	x			
ACSP	ACSP-B2D(24-26)	8/17/01	x	x			
ACSP	ACSP-B2E(00-02)	8/20/01	x	x			
ACSP	ACSP-B2E(08-10)	8/20/01	x	x			
ACSP	ACSP-B2E(22-24)	8/20/01	x	x			
ACSP	ACSP-B3A(00-0.5)	5/8/01			x		
ACSP	ACSP-B3A(04-06)	5/8/01			x		
ACSP	ACSP-B3A(06-08)	5/8/01			x		
ACSP	ACSP-B3A(10-12)	5/8/01			x		
ACSP	ACSP-B3A(12-14)	5/8/01			x		
ACSP	ACSP-B3D(00-02)	8/17/01			x		
ACSP	ACSP-B3D(05-07)	8/17/01			x		
ACSP	ACSP-B3D(07-09)	8/17/01			x		
ACSP	ACSP-B3D(10-12)	8/17/01			x		
ACSP	ACSP-B3D(12-14)	8/17/01			x		
ACSP	ACSP-B3E(00-02)	8/6/01			x		
ACSP	ACSP-B3E(02-04)	8/6/01			x		
ACSP	ACSP-B3E(04-06)	8/6/01			x		
ACSP	ACSP-B3K(00-02)	8/6/01			x		
ACSP	ACSP-B3K(02-04)	8/6/01			x		
ACSP	ACSP-B3K(04-06)	8/6/01			x		
ACSP	ACSP-B4A(00-02)	5/9/01			x		
ACSP	ACSP-B4A(02-04)	5/9/01			x		
ACSP	ACSP-B4A(04-06)	5/9/01			x		
ACSP	ACSP-B4A(06-08)	5/9/01			x		
ACSP	ACSP-B4A(08-10)	5/9/01			x		
ACSP	ACSP-B4A(10-12)	5/9/01			x		

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GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
ACSP	ACSP-B4A(12-14)	5/9/01			x		
ACSP	ACSP-B4B(00-02)	5/9/01			x		
ACSP	ACSP-B4B(02-04)	5/9/01			x		
ACSP	ACSP-B4B(04-06)	5/9/01			x		
ACSP	ACSP-B4B(06-08)	5/9/01			x		
ACSP	ACSP-B4B(08-10)	5/9/01			x		
ACSP	ACSP-B4B(10-12)	5/9/01			x		
ACSP	ACSP-DUP1	10/26/00	x	x		x	Duplicate of ACSP-B2(14-16) for VOCs, SVOCs; ACSP-B3(10-12) for Inorganics
ACSP	ACSP-DUP-01	5/8/01			x		Duplicate of ACSP-B1A(02-04)
ACSP	ACSP-DUP-02	5/9/01			x		Duplicate of ACSP-B2A(10-12)
ACSP	ACSP-DUP-03	5/9/01			x		Duplicate of ACSP-B4B(02-04)
ACSP	ACSP-DUP-05	8/6/01			x		Duplicate of ACSP-B3K(02-04)
ACSP	ACSP-B3D-DUP-44	8/6/01			x		Duplicate of ACSP-B3D(12-14)
ACSP	ACSP-B3D-DUP-45	8/20/01	x	x			Duplicate of ACSP-B2E(06-08)
ACSP	ACSP-B3D-DUP-46	8/20/01	x	x			Duplicate of ACSP-B2E(14-16)
BD01	BD01-02(00-02)	11/30/01	x	x	x	x	
BD01	BD01-02(08-10)	11/30/01	x	x	x	x	
BD01	BD01-02(12-14)	11/30/01	x	x	x	x	
EP	BD 94 EP-01(0.5-02)	5/7/01	x	x	x	x	
EP	BD 94 EP-01(08-10)	5/7/01	x	x	x	x	
EP	BD 94 EP-01(14-16)	5/7/01	x	x	x	x	
EP	BD 94 EP-02(0.33-02)	5/7/01	x	x	x	x	
EP	BD 94 EP-02(08-10)	5/7/01	x	x	x	x	
EP	BD 94 EP-02(16-18)	5/7/01	x	x	x	x	
EP	BD 94 EP-03(0.5-02)	5/7/01	x	x	x	x	
EP	BD 94 EP-03(08-10)	5/7/01	x	x	x	x	
EP	BD 94 EP-03(16-18)	5/7/01	x	x	x	x	
EP	BD 94 EP-DUP-01	5/7/01	x	x	x	x	Duplicate of BD 94 EP-03(16-18)
EP	EP94-02A(2.5-4.5)	8/17/01	x	x	x		
EP	EP94-02A(4.5-6.5)	8/17/01	x	x	x		
EP	EP94-02B(0.5-2.5)	8/17/01	x	x	x		
EP	EP94-02B(2.5-4.5)	8/17/01	x	x	x		
WL	WL-B1(8-10)	10/27/00	x	x		x	
WL	WL-B2(2-4)	10/30/00	x	x		x	
WL	WL-B3(10-12)	10/30/00	x	x		x	
WL	WL-B4(2-4)	10/30/00	x	x		x	
WL	WL-B5(10-12)	10/31/00	x	x		x	
WL	WL-B6(10-12)	10/31/00	x	x		x	
WL	WL-B1A(0.5-02)	5/14/01			x		
WL	WL-B1A(00-0.5)	5/14/01			x		
WL	WL-B1A(02-04)	5/14/01			x		
WL	WL-B1A(04-06)	5/14/01			x		
WL	WL-B1A(06-08)	5/14/01			x		
WL	WL-B1A(08-10)	5/14/01			x		
WL	WL-B1A(10-12)	5/14/01			x		
WL	WL-B1A(12-14)	5/14/01			x		
WL	WL-B1A(14-16)	5/14/01			x		

TABLE 2-3

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

SOIL SAMPLE COLLECTION SUMMARY

AOI_ID	Sample ID	Date Collected	Analyzed Parameters*				Notes
			VOC	SVOC	PCB	Inorg	
WL	WL-B2A(0.5-02)	5/14/01			x		
WL	WL-B2A(00-0.5)	5/14/01			x		
WL	WL-B2A(02-04)	5/14/01			x		
WL	WL-B2A(04-06)	5/14/01			x		
WL	WL-B2A(06-08)	5/14/01			x		
WL	WL-B2A(08-10)	5/14/01			x		
WL	WL-B3A(0.5-02)	5/14/01			x		
WL	WL-B3A(00-0.5)	5/14/01			x		
WL	WL-B3A(04-06)	5/14/01			x		
WL	WL-B3A(06-08)	5/14/01			x		
WL	WL-B3A(08-10)	5/14/01			x		
WL	WL-B4A(0.5-02)	5/14/01			x		
WL	WL-B4A(00-0.5)	5/14/01			x		
WL	WL-B5A(0.5-02)	5/14/01			x		
WL	WL-B5A(00-0.5)	5/14/01			x		
WL	WL-B5A(02-04)	5/14/01			x		
WL	WL-B6A(00-0.5)	5/10/01			x		
WL	WL-B6A(00-02)	5/10/01			x		
WL	WL-B6A(02-04)	5/10/01			x		
WL	WL-B6A(04-06)	5/10/01			x		
WL	WL-B6A(06-08)	5/10/01			x		
WL	WL-B6A(08-10)	5/10/01			x		
WL	WL-DUP-01	5/10/01			x		Duplicate of WL-B6A(09-10)
WL	WL-B5A-DUP-07	5/14/01			x		Duplicate of WL-B5A(00-0.5)
WL	WL-B2A-DUP-08	5/14/01			x		Duplicate of WL-B2A(08-10)
WL	WL-B1A-DUP-09	5/14/01			x		Duplicate of WL-B1A(06-08)

Notes:

1. AOI = area of interest
2. VOC = volatile organic compounds
3. SVOC = semivolatile organic compounds
4. PCB = polychlorinated biphenyls
5. Inorg = inorganic constituents
6. * Analyses were completed for the VOC, SVOC, PCB, and/or Inorganic suite of compounds/constituents included in ths QAPP defined project analyte list.

TABLE 2-4

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

WATER SAMPLE COLLECTION SUMMARY

			Total (unfiltered)					Dissolved (filtered)		
Sample Type	AOI_ID	Sample ID	VOC	SVOC	PCB	Inorg	Inorg (ultra low flow)	PCB	Inorg	Notes
Monitoring Well	38-1	RFI-38-04(092701)	x	x	x	x		x	x	
Monitoring Well	38-1	RFI-38-05(092801)	x	x	x	x		x	x	
Monitoring Well	38-1	RFI-38-06(092801)	x	x	x	x		x	x	
Monitoring Well	38-1	RFI-38-06(022102)							Tl	
Monitoring Well	38-1	36-101(092801)	x	x	x	x		x	x	
Monitoring Well	38-1	38-120(092701)	x	x	x	x		x	x	
Monitoring Well	38-1	RFI-38-DUP-111	x	x	x	x		x	x	Duplicate of RFI-38-06(092801)
Monitoring Well	36-1	RFI-36-02(100401)	x	x	x	x		x	x	
Monitoring Well	36-1	RFI-36-03(092701)	x	x	x	x		x	x	
Monitoring Well	36-1	RFI-36-04(092801)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-1	RFI-36-05(092101)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-1	RFI-36-17(092801)	x							
Monitoring Well	36-1	RFI-36-18(092801)	x							
Monitoring Well	36-1	RFI-36-23(022002)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-1	RFI-36-24(100501)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-1	RFI-36-25R(022602)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-1	RFI-36-27(022002)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-1	RFI-36-29(100301)	x							
Monitoring Well	36-1	RFI-36-29R(022602)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-1	RFI-36-31(100501)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-1	RFI-36-32(092801)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-1	RFI-36-35(092701)	x	x	x	x		x	x	
Monitoring Well	36-1	RFI-36-44(022002)	x						x	
Monitoring Well	36-1	RFI-36-45(022002)	x						x	
Monitoring Well	36-1	RFI-36-46(022502)	x							
Monitoring Well	36-1	36-100(092701)	x	x	x	x		x	x	
Monitoring Well	36-1	36-120(092701)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-1	36-121(092701)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-1	36-FP1(092701)	x	x	x	x		x	x	
Monitoring Well	36-1	RFI-36-DUP-106	x	x	x	x		x	x	Duplicate of RFI-36-05(092101)
Monitoring Well	36-1	RFI-36-DUP-109	x	x	x	CN, Hg		x	x	Duplicate of 36-FP1(092701)
Monitoring Well	36-1	RFI-36-DUP-301	x	x	x	CN, Hg		x	x	Duplicate of RFI-36-29R(022602)
Monitoring Well	36-2	RFI-36-19(092801)	x							
Monitoring Well	36-2	RFI-36-37(092801)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-2	36-FP2(092801)	x	x	x	x		x	x	
Monitoring Well	36-2	36-FP5(092801)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-3	RFI-36-08(092701)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-3	RFI-36-09(092701)	x	x	x	x		x	x	
Monitoring Well	36-3	RFI-36-10(092801)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-3	RFI-36-20(092801)	x	x						
Monitoring Well	36-3	RFI-36-43(022602)	x							
Monitoring Well	36-3	36-FP8(092701)	x	x	x	x		x	x	
Grab Sample	36-3	36-Basement-072301	x	x	x	CN, Hg		x	x	
Grab Sample	36-3	36-Basement(072601)	x	x	x			x	x	
Monitoring Well	36-4	RFI-36-11(092101)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-4	RFI-36-12(092801)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-5	RFI-36-13(110901)	x	x	x	x		x	x	
Monitoring Well	36-5	RFI-36-14(100201)	x	x	x	x	x	x	x	
Monitoring Well	36-5	RFI-36-14(022002)				Mn, Ni			Mn, Ni	
Monitoring Well	36-5	20-100(092101)	x	x	x	x		x	x	
Monitoring Well	36-5	20-102(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-5	20-500(092101)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-5	37-01(092601)	x	x	x	CN, Hg		x	x	
Monitoring Well	36-5	RFI-36-DUP-110	x	x	x	x		x	x	Duplicate of RFI-36-14(100201)
Monitoring Well	55-1	RFI-55-01(092601)	x	x	x	CN, Hg		x	x	
Monitoring Well	55-1	RFI-55-02(092701)	x	x	x	CN, Hg		x	x	
Monitoring Well	55-1	RFI-55-09(092701)	x	x	x	CN, Hg		x	x	
Monitoring Well	55-1	RFI-55-10(022602)	x							
Monitoring Well	55-1	20-120(092101)	x	x	x	CN, Hg		x	x	

TABLE 2-4

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

WATER SAMPLE COLLECTION SUMMARY

			Total (unfiltered)					Dissolved (filtered)		
Sample Type	AOI_ID	Sample ID	VOC	SVOC	PCB	Inorg	Inorg (ultra low flow)	PCB	Inorg	Notes
Monitoring Well	55-1	55-1(092601)	x	x	x	CN, Hg		x	x	
Monitoring Well	55-1	55-2(092601)	x	x	x	CN, Hg		x	x	
Monitoring Well	55-1	55-3(092601)	x	x	x	CN, Hg		x	x	
Monitoring Well	55-1	55-4(092601)	x	x	x	CN, Hg		x	x	
Monitoring Well	55-1	55-5(092601)	x	x	x	CN, Hg		x	x	
Monitoring Well	10-1	RFI-10-01(092401)	x	x	x	CN, Hg		x	x	
Monitoring Well	10-1	RFI-10-01(022202)							Ba	
Monitoring Well	10-1	20-121(092101)	x	x	x	CN, Hg		x	x	
Monitoring Well	10-1	20-144(022202)	x							
Monitoring Well	10-1	20-145(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	10-1	43-167(092601)	x	x	x	CN, Hg		x	x	
Monitoring Well	10-2	RFI-10-02(092401)	x	x	x	CN, Hg		x	x	
Monitoring Well	10-2	RFI-10-03(092601)	x	x	x	CN, Hg		x	x	
Monitoring Well	10-2	RFI-10-04(092601)	x	x	x	x		x	x	
Monitoring Well	10-2	RFI-10-05(092401)	x							
Monitoring Well	10-2	RFI-10-12(092601)	x	x	x	CN, Hg		x	x	
Monitoring Well	10-2	RFI-10-24(022002)	x							
Monitoring Well	10-2	RFI-10-25(022002)	x							
Monitoring Well	10-2	RFI-10-26(022102)	x						Mn	
Monitoring Well	10-3	RFI-10-06(092401)	x	x	x	x		x	x	
Monitoring Well	10-3	RFI-10-07(112001)	x	x	x	x		x	x	
Monitoring Well	10-3	RFI-10-08(092601)	x	x	x	CN, Hg		x	x	
Monitoring Well	10-3	RFI-10-15(092401)	x							
Monitoring Well	10-3	20-101R(111501)	x	x	x	x		x	x	
Monitoring Well	10-3	20-103N(092101)	x	x	x	x		x	x	
Monitoring Well	10-3	20-105R(120601)	x	x	x	x		x	x	
Monitoring Well	10-4	RFI-10-11(100101)	x	x	x	x	x	x	x	x
Monitoring Well	10-4	RFI-10-11(100301)					CN			CN
Monitoring Well	10-4	20-504(092101)	x	x	x	CN, Hg		x	x	
Monitoring Well	10-4	20-FP6(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	10-4	20-FP10(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	10-4	20-FP11(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	10-4	30-100(092101)	x	x	x	CN, Hg		x	x	
Monitoring Well	10-4	20-FP6(022002)	x							
Monitoring Well	10-4	20-FP10(022202)	x							
Monitoring Well	05-1	RFI-05-21(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-1	30-120(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-1	43-166(092601)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-1	43-168(092701)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-1	RFI-05-DUP-107	x	x	x	CN, Hg		x	x	Duplicate of RFI-05-21(092501)
Monitoring Well	05-2	RFI-05-01(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-2	RFI-05-02(092001)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-2	20-140(022202)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-2	RFI-05-DUP-105	x	x	x	CN, Hg		x	x	Duplicate of RFI-05-02(092001)
Monitoring Well	05-3	RFI-05-03(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-3	RFI-05-04(091901)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-3	RFI-05-05(091901)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-3	RFI-05-06(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-3	43-100(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-3	43-101R(111501)	x	x	x	x		x	x	
Monitoring Well	05-4	43-103(092501)	x	x	x			x	x	
Monitoring Well	05-4	RFI-05-07(092001)	x	x	x			x	x	
Monitoring Well	05-5	43-220(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-5	RFI-05-10(091901)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-5	RFI-05-12(092001)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-6	RFI-05-19S(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-6	RFI-05-19DR(121101)	x	x	x	x		x	x	
Monitoring Well	05-6	RFI-05-20(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-6	RFI-05-30(021902)	x							

TABLE 2-4

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

WATER SAMPLE COLLECTION SUMMARY

			Total (unfiltered)					Dissolved (filtered)		
Sample Type	AOI_ID	Sample ID	VOC	SVOC	PCB	Inorg	Inorg (ultra low flow)	PCB	Inorg	Notes
Monitoring Well	05-6	30-140(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-6	43-140(092601)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-6	43-141(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	05-6	43-242(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	03-1	RFI-03-01(091901)	x	x	x	CN, Hg		x	x	
Monitoring Well	03-1	RFI-03-02(022602)	x	x	x	CN, Hg		x	x	
Monitoring Well	03-1	RFI-03-03(092101)	x	x	x	CN, Hg		x	x	
Monitoring Well	03-1	RFI-03-04(092101)	x	x	x	CN, Hg		x	x	
Monitoring Well	03-1	03-02(092001)	x	x	x	CN, Hg		x	x	
Monitoring Well	03-1	03-101(092701)	x	x	x	CN, Hg		x	x	
Monitoring Well	03-1	03-109(092601)	x	x	x	CN, Hg		x	x	
Monitoring Well	03-1	03-111(092101)	x	x	x	CN, Hg		x	x	
Monitoring Well	03-1	03-114(092101)	x	x	x	CN, Hg		x	x	
Monitoring Well	03-1	70-100(092401)	x	x	x	CN, Hg		x	x	
Monitoring Well	03-1	70-109(092401)	x	x	x	CN, Hg		x	x	
Monitoring Well	81-1	RFI-81-02(101301)	x	x	x	CN, Hg		x	x	
Monitoring Well	81-1	RFI-81-35(021902)	x							
Temporary Well	81-1	RFI-81-23(090701)	x	x	x			x	x	
Temporary Well	81-1	RFI-81-24(090701)	x	x	x			x	x	
Monitoring Well	81-2	RFI-81-03(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	81-2	RFI-81-13(092401)	x	x	x	CN, Hg		x	x	
Monitoring Well	81-2	RFI-81-21(100401)	x							
Temporary Well	81-2	RFI-81-05(091901)	x	x	x	CN, Hg		x		
Temporary Well	81-2	RFI-81-20(091901)	x	x	x	CN, Hg		x		
Monitoring Well	81-2	70-102(092701)	x	x	x	x		x	x	
Monitoring Well	81-2	70-160(092601)	x	x	x	CN, Hg		x	x	
Monitoring Well	81-2	70-163(092801)	x	x	x	x		x	x	
Monitoring Well	81-2	70-165(092601)	x	x	x	CN, Hg		x	x	
Temporary Well	81-3	RFI-81-07(072701)	x	x	x			x	x	
Monitoring Well	81-3	RFI-81-08(092401)	x	x	x	CN, Hg		x	x	
Monitoring Well	81-3	RFI-81-11(092401)	x	x	x	CN, Hg		x	x	
Monitoring Well	81-3	RFI-81-12R(120701)	x	x	x	x		x	x	
Monitoring Well	81-3	RFI-81-33(021902)	x							
Monitoring Well	81-3	86-100(092401)	x	x	x	CN, Hg		x	x	
Monitoring Well	81-4	RFI-81-09(022202)	x							
Monitoring Well	81-4	RFI-81-09(092401)	x	x	x	CN, Hg		x	x	
Temporary Well	81-5	RFI-81-10(062201)	x	x	x			x	x	
Temporary Well	21-1	RFI-21-01(062501)	x	x	x			x	x	
Temporary Well	21-1	RFI-21-02(062701)	x	x	x			x	x	
Temporary Well	21-1	RFI-21-03(062101)	x	x	x			x	x	
Monitoring Well	21-1	RFI-21-04(111901)	x	x	x	x		x	x	
Monitoring Well	65-1	RFI-65-01(092401)	x	x	x	CN, Hg		x	x	
Monitoring Well	83/84-1	RFI-83/84-01(092101)	x	x	x	CN, Hg		x	x	
Monitoring Well	83/84-1	RFI-83/84-02(100101)	x	x	x	CN, Hg	CN	x	x	
Monitoring Well	83/84-2	RFI-83/84-25(121301)	x	x	x	x		x	x	
Monitoring Well	83/84-2	RFI-83/84-27(022102)	x	x	x	CN, Hg		x	x	
Monitoring Well	83/84-2	RFI-83/84-29(022102)	x	x	x	CN, Hg		x	x	
Monitoring Well	83/84-3	RFI-83/84-20(022202)	x	x	x	CN, Hg		x	x	
Temporary Well	83/84-3	RFI-83/84-05(073101)	x	x	x			x	x	
Monitoring Well	83/84-3	11-140(092801)	x	x	x	CN, Hg		x	x	
Temporary Well	83/84-4	RFI-83/84-08(073101)	x	x	x			x	x	
Temporary Well	83/84-5	RFI-83/84-09(073101)	x	x	x			x	x	
Monitoring Well	83/84-5	11-120(092501)	x	x	x	CN, Hg		x	x	
Monitoring Well	83/84-5	RFI-83/84-DUP-108	x	x	x	CN, Hg		x	x	Duplicate of 11-120(092501)
Monitoring Well	83/84-7	RFI-83/84-11(092401)	x	x	x	CN, Hg		x	x	
Monitoring Well	83/84-7	88-2(092001)	x	x	x	CN, Hg		x	x	
Monitoring Well	83/84-7	88-7(092001)	x	x	x	CN, Hg		x	x	
Monitoring Well	83/84-7	88-8(092001)	x	x	x	CN, Hg		x	x	
Monitoring Well	83/84-7	88-9(092001)	x	x	x	CN, Hg		x	x	

TABLE 2-4

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

WATER SAMPLE COLLECTION SUMMARY

			Total (unfiltered)					Dissolved (filtered)		
Sample Type	AOI_ID	Sample ID	VOC	SVOC	PCB	Inorg	Inorg (ultra low flow)	PCB	Inorg	Notes
Temporary Well	85-1	RFI-85-02(062201)	x	x	x			x	x	
Monitoring Well	85-1	RFI-85-02R(121301)	x	x	x	x		x	x	
Monitoring Well	85-1	RFI-85-03(092601)	x	x	x	CN, Hg		x	x	
Monitoring Well	85-1	RFI-85-04R(022802)	x	x	x	CN, Hg		x	x	
Monitoring Well	85-1	RFI-85-05(101801)	x	x	x	CN, Hg		x	x	
Monitoring Well	85-1	RFI-85-06(092401)	x	x	x	CN, Hg		x	x	
Monitoring Well	85-1	RFI-85-07(111901)	x	x	x	x		x	x	
Monitoring Well	86-1	RFI-02-08(091901)	x	x	x	x		x	x	
Monitoring Well	86-1	RFI-86-01(092001)	x	x	x	x		x	x	
Monitoring Well	86-1	RFI-86-03(092001)	x	x	x	CN, Hg		x	x	
Monitoring Well	86-1	RFI-86-04(092701)	x	x	x	CN, Hg		x	x	
Monitoring Well	86-1	RFI-86-05(092701)	x	x	x	CN, Hg		x	x	
Monitoring Well	86-1	RFI-86-06D(092801)	x	x	x	x		x	x	
Monitoring Well	86-1	RFI-86-06S(100201)	x	x	x	CN, Hg		x	x	
Temporary Well	86-1	RFI-86-07(052401)	x	x	x			x	x	
Temporary Well	86-1	RFI-86-08(072001)	x	x	x			x	x	
Monitoring Well	86-1	RFI-86-08R(022102)	x	x	x	CN, Hg		x	x	
Monitoring Well	86-1	RFI-86-15(021902)	x							
Monitoring Well	86-1	86-3(092601)	x	x	x	CN, Hg		x	x	
Monitoring Well	86-1	87-FP2(092401)	x	x	x	CN, Hg		x	x	
Monitoring Well	86-1	87-FP3(092701)	x	x	x	CN, Hg		x	x	
Monitoring Well	86-1	87-FP5(092601)	x	x	x	CN, Hg		x	x	
Temporary Well	86-1	RFI-86-DUP-15W	x	x	x			x	x	Duplicate of RFI-86-07(052401)
Monitoring Well	86-1	RFI-86-DUP-300(022102)	x	x	x	CN, Hg		x	x	Duplicate of RFI-86-08R(022102)
Temporary Well	07-1	RFI-07-02(061901)	x	x	x			x	x	
Monitoring Well	07-1	RFI-07-03(092501)	x	x	x	CN, Hg		x	x	
Temporary Well	07-1	RFI-07-04(061401)	x	x	x			x	x	
Monitoring Well	07-1	07-02(092001)	x	x	x	CN, Hg		x	x	
Temporary Well	07-3	RFI-07-07(080101)	x	x	x			x	x	
Monitoring Well	07-3	RFI-07-08(092001)	x	x	x	x		x	x	
Monitoring Well	07-3	07-01(092001)	x	x	x	CN, Hg		x	x	
Temporary Well	07-3	RFI-07-DUP-21	x	x	x			x	x	Duplicate of RFI-07-07(080101)
Monitoring Well	07-3	RFI-07-DUP-104	x	x	x	x		x	x	Duplicate of RFI-07-08(092001)
Temporary Well	94-A	RFI-94-01(052201)	x	x	x			x	x	
Temporary Well	94-C	RFI-94-03(052101)	x	x	x			x	x	
Temporary Well	94-C	RFI-94-04(052201)	x	x	x			x	x	
Temporary Well	94-E	RFI-94-06(052101)	x	x	x			x	x	
Temporary Well	84-A	RFI-84-01(052301)	x	x	x			x	x	
Temporary Well	84-A	RFI-84-02(052401)	x	x	x			x	x	
Temporary Well	84-B	RFI-84-03(052201)	x	x	x			x	x	
Temporary Well	84-B	RFI-84-DUP-14	x	x	x			x	x	Duplicate of RFI-84-03(052201)
Temporary Well	84-C	RFI-84-04(052301)	x	x	x			x	x	
Monitoring Well	84-D	RFI-84-05(100201)	x	x	x	CN, Hg		x	x	
Monitoring Well	84-D	84-2(101701)	x	x	x	CN, Hg		x	x	
Monitoring Well	84-D	84-6(101701)	x	x	x	CN, Hg		x	x	
Monitoring Well	84-D	RFI-84-DUP-112	x	x	x	CN, Hg		x	x	Duplicate of 84-2(101701)
Monitoring Well	17-A	RFI-17-02(100301)	x	x	x	CN, Hg	x	x	x	
Temporary Well	17-A	RFI-17-01(052201)	x	x	x			x	x	
Temporary Well	02-A	RFI-02-01(051801)	x	x	x			x	x	
Temporary Well	02-B	RFI-02-02(051801)	x	x	x			x	x	
Temporary Well	02-B	RFI-02-DUP-15	x	x	x			x	x	Duplicate of RFI-02-02(051801)
Temporary Well	02-C	RFI-02-03(051801)	x	x	x				x	
Temporary Well	02-C	RFI-02-03(052501)						x		
Temporary Well	02-D	RFI-02-04(051801)	x	x	x			x	x	
Monitoring Well	02-E	RFI-02-05(091801)	x	x	x	x		x	x	
Monitoring Well	02-E	RFI-02-DUP-103	x	x	x	x		x	x	Duplicate of RFI-02-05(091801)
Monitoring Well	02-F	RFI-02-07(091801)	x	x	x	x		x	x	
Monitoring Well	23-A	RFI-23-01(091801)	x	x	x	CN, Hg		x	x	
Monitoring Well	23-A	RFI-23-02(091801)	x	x	x	CN, Hg		x	x	

TABLE 2-4

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

WATER SAMPLE COLLECTION SUMMARY

			Total (unfiltered)					Dissolved (filtered)		
Sample Type	AOI_ID	Sample ID	VOC	SVOC	PCB	Inorg	Inorg (ultra low flow)	PCB	Inorg	Notes
Temporary Well	29-A	RFI-29-01(052301)	x	x	x			x	x	
Temporary Well	12-A	RFI-12-01(051601)	x	x	x			x	x	
Temporary Well	12-A	RFI-12-03(052401)	x	x	x			x	x	
Temporary Well	12-A	RFI-12-07(051601)	x	x	x			x	x	
Temporary Well	12-A	RFI-12-08(051601)	x	x	x			x	x	
Temporary Well	12-A	RFI-12-10(053101)	x	x	x			x	x	
Monitoring Well	12-A	RFI-12-15(091801)	x	x	x	CN, Hg		x	x	
Monitoring Well	12-A	RFI-12-21(120601)	x	x	x	x		x	x	
Monitoring Well	12-A	04-121(092801)	x	x	x	CN, Hg		x	x	
Grab Sample	12-A	Basement Water(091801)	x	x	x	CN, Hg		x	x	
Grab Sample	12-A	RFI-12-DUP-102	x	x	x	CN, Hg		x	x	Duplicate of Basement Water(091801)
Temporary Well	12-B	RFI-12-05(051601)	x	x	x			x	x	
Monitoring Well	12-B	RFI-12-11S(091901)	x	x	x	CN, Hg		x	x	
Temporary Well	12-C	RFI-12-06(052501)	x	x	x			x	x	
Temporary Well	12-D	RFI-12-04(052301)	x	x	x			x	x	
Temporary Well	04-A	RFI-04-01(061101)	x	x	x			x	x	
Temporary Well	04-B	RFI-04-02(071601)	x	x	x			x	x	
Temporary Well	04-B	RFI-04-03(060801)	x	x	x			x	x	
Temporary Well	04-C	RFI-04-04(060801)	x	x	x			x	x	
Monitoring Well	04-D	04-1(091401)	x	x	x			x	x	
Monitoring Well	04-D	04-2(091701)	x	x	x	CN, Hg		x	x	
Monitoring Well	04-D	04-3(091701)	x	x	x	CN, Hg		x	x	
Monitoring Well	04-D	04-4(091701)	x	x	x	CN, Hg		x	x	
Monitoring Well	04-D	04-5(091801)	x	x	x	CN, Hg		x	x	
Monitoring Well	04-D	04-DUP-100	x	x	x	CN, Hg		x	x	Duplicate of 04-2(091701)
Monitoring Well	16-A	RFI-16-01(081401)	x	x	x			x	x	
Monitoring Well	16-A	RFI-16-01(092001)				CN, Hg				
Temporary Well	16-B	RFI-16-02(051801)	x	x	x			x	x	
Temporary Well	16-C	RFI-16-03(051701)	x	x	x			x	x	
Monitoring Well	16-C	RFI-16-04(081001)	x	x	x			x	x	
Monitoring Well	16-C	RFI-16-04(091801)				CN, Hg				
Temporary Well	16-C	RFI-16-05(051701)	x	x	x			x	x	
Monitoring Well	16-C	RFI-16-07(081001)	x	x	x			x	x	
Monitoring Well	16-C	RFI-16-07(091801)				CN, Hg				
Monitoring Well	16-C	RFI-16-09(081001)	x	x	x			x	x	
Monitoring Well	16-C	RFI-16-09(091801)				CN, Hg				
Monitoring Well	16-C	RFI-16-11(081301)	x	x	x			x	x	
Monitoring Well	16-C	RFI-16-11(091801)				CN, Hg				
Monitoring Well	16-C	RFI-16-12(022802)	x	x	x	CN, Hg		x	x	
Monitoring Well	16-C	RFI-16-20(121201)	x	x	x	x		x	x	
Monitoring Well	16-C	RFI-16-DUP-30	x	x	x			x	x	Duplicate of RFI-16-07(081001)
Temporary Well	16-D	RFI-16-06(051701)	x	x	x	x				
Temporary Well	40-A	RFI-40-01(052901)	x	x	x			x	x	
Monitoring Well	40-A	RFI-40-07(022502)	x	x	x	CN, Hg		x	x	
Monitoring Well	40-A	RFI-40-09(022602)	x	x	x	CN, Hg		x	x	
Monitoring Well	40-A	40-2(092001)	x	x	x	CN, Hg		x	x	
Monitoring Well	40-A	40-3(091801)	x	x	x	CN, Hg		x	x	
Monitoring Well	40-A	40-4R(112101)	x	x	x	x		x	x	
Monitoring Well	40-A	40-5(091801)	x	x	x	CN, Hg		x	x	
Monitoring Well	40-A	40-6(091801)	x	x	x	CN, Hg		x	x	
Monitoring Well	40-B	RFI-40-10(022102)	x	x	x	CN, Hg		x	x	
Monitoring Well	40-C	RFI-40-03(022502)	x	x	x	CN, Hg		x	x	
Monitoring Well	40-D	RFI-40-04(022502)	x							
Monitoring Well	40-D	40-301(091701)	x	x	x	CN, Hg		x	x	
Monitoring Well	40-D	40-302(091701)	x	x	x	CN, Hg		x	x	
Monitoring Well	40-D	40-303R(120701)	x	x	x	x		x	x	
Monitoring Well	40-D	40-304(091401)	x	x	x			x	x	
Monitoring Well	40-D	40-305(091701)	x	x	x	CN, Hg		x	x	
Grab Sample	40-D	TW(091801)	x	x	x	CN, Hg		x	x	

TABLE 2-4

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

WATER SAMPLE COLLECTION SUMMARY

			Total (unfiltered)					Dissolved (filtered)		
Sample Type	AOI_ID	Sample ID	VOC	SVOC	PCB	Inorg	Inorg (ultra low flow)	PCB	Inorg	Notes
Temporary Well	44-A	RFI-44-01(052201)	x	x	x			x	x	
Temporary Well	44-A	RFI-44-02(052101)	x	x	x			x	x	
Temporary Well	44-A	RFI-44-03(052501)	x	x	x			x	x	
Monitoring Well	44-A	RFI-44-04(091801)	x	x	x	CN, Hg		x	x	
Monitoring Well	44-A	RFI-44-05(091401)	x	x	x			x	x	
Monitoring Well	44-A	04-120(091701)	x	x	x	CN, Hg		x	x	
Monitoring Well	44-A	04-140(100101)	x	x	x	CN, Hg	x	x	x	
Monitoring Well	44-A	04-160(092101)	x	x	x	CN, Hg		x	x	
Monitoring Well	09-A	RFI-09-01(091401)	x	x	x			x	x	
Temporary Well	09-A	RFI-09-02(053001)	x	x	x			x	x	
Temporary Well	09-A	RFI-09-03(052901)	x	x	x			x	x	
Monitoring Well	09-A	RFI-09-04R(112801)	x	x	x	x		x	x	
Monitoring Well	09-A	RFI-09-DUP-113	x	x	x	x		x	x	Duplicate of RFI-09-04R(112801)
Temporary Well	09-B	RFI-09-05(052901)	x	x	x			x	x	
Monitoring Well	09-B	RFI-09-06(091301)	x	x	x	x		x	x	
Monitoring Well	09-B	RFI-09-08(091401)	x	x	x			x	x	
Monitoring Well	09-B	RFI-09-09(091701)	x	x	x	CN, Hg		x	x	
Monitoring Well	09-B	RFI-09-10(091301)	x	x	x	x		x	x	
Monitoring Well	09-B	RFI-09-11(091701)	x	x	x	CN, Hg		x	x	
Monitoring Well	09-B	RFI-09-12(121301)	x	x	x	x		x	x	
Monitoring Well	09-B	RFI-09-13(100301)	x						Ba, pb	
Monitoring Well	09-B	RFI-09-14(100301)	x						Ba, pb	
Monitoring Well	09-B	31-5(091701)	x	x	x	CN, Hg		x	x	
Monitoring Well	09-B	31-6(091701)	x	x	x	CN, Hg		x	x	
Monitoring Well	09-B	31-8(091701)	x	x	x	CN, Hg		x	x	
Monitoring Well	09-B	MW-22(022702)	x							
Monitoring Well	09-B	MW-23(022702)	x							
Monitoring Well	09-B	MW-24(022802)	x							
Monitoring Well	09-B	RFI-09-DUP-101	x	x	x	CN, Hg		x	x	Duplicate of RFI-09-11(091701)
Monitoring Well	ACSP	ACSP-TW1(102700)	x	x					x	
Monitoring Well	ACSP	ACSP-TW3(102700)	x	x					x	
Monitoring Well	ACSP	ACSP-B2A(071601)	x	x						
Monitoring Well	ACSP	ACSP-B2B(071601)	x	x						
Monitoring Well	ACSP	ACSP-TW-DUP1(102700)	x	x					x	Duplicate of ACSP-TW1(102701)
Temporary Well	BD01	BD01-02(113001)	x	x	x	x		x	x	
Temporary Well	WL	WL-TW1(103100)	x	x	x				x	
Temporary Well	WL	WL-TW2(103100)	x	x	x				x	
Temporary Well	WL	WL-TW3(103100)	x	x	x				x	
Monitoring Well	WL	GM-1(110800)	x	x				x	x	
Monitoring Well	WL	GM-4(110800)	x	x				x	x	
Monitoring Well	WL	GM-11(110800)	x	x				x	x	
Monitoring Well	WL	GM-12(110800)	x	x				x	x	
Temporary Well	WL	WL-TW-DUP(103100)	x	x	x				x	Duplicate of WL-TW-3(103100)
Monitoring Well	EP	BD 94 EP-02(053101)	x	x	x			x	x	
Monitoring Well	EP	BD 94 EP-03(053101)	x	x	x			x	x	
Monitoring Well	EP	BD 94 EP-DUP-16	x	x	x			x	x	Duplicate of BD 94 EP-02(053101)
Monitoring Well	EP	94-100	x							Sampled for formaldehyde only

Notes:

1. AOI = area of interest
2. VOC = volatile organic compounds
3. SVOC = semivolatile organic compounds
4. PCB = polychlorinated biphenyls
5. Inorg = inorganic constituents
6. * Analyses were completed for the VOC, SVOC, PCB, and/or Inorganic suite of compounds/constituents included in ths QAPP defined project analyte list.

TABLE 2-5

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

LNAPL SAMPLE COLLECTION SUMMARY

Sample Type	AOI_ID	Sample ID	Date Collected	VOC	SVOC	PCB	Inorg	TPH	Viscosity	Density	Interfacial Tension	Notes
LNAPL	36-1	RFI-36-06-OIL	12/21/00	x	x			x	x	x	x	
LNAPL	36-1	RFI-36-07 OIL	21/21/00									Physical description only
LNAPL	36-1	RFI-36-15-OIL	12/21/00	x	x			x	x	x	x	
LNAPL	36-1	RFI-36-16-OIL	12/21/00	x	x			x	x	x	x	
LNAPL	36-5	Tank 37 North(022702)NL	2/27/02	x	x				x	x	x	
LNAPL	05-5	RFI-05-11 OIL	2/6/01	x	x	x		x	x	x	x	
LNAPL	05-6	RFI-05-13 OIL	2/6/01	x	x	x		x	x	x	x	
LNAPL	05-6	RFI-05-14 OIL	2/6/01	x	x	x		x	x	x	x	
LNAPL	03-1	03-03(022702)NL	2/27/02	x	x				x	x	x	
LNAPL	81-2	70-101(022702)NL	2/27/02	x	x				x	x	x	
LNAPL	85-1	RFI-85-02(082101)NL	8/21/01	x	x	x	x		x	x	x	
LNAPL	83/84-2	RFI-83/84-06(101601)NL	10/16/01	x	x	x	x		x	x	x	
LNAPL	83/84-4	RFI-83/84-07(092001)NL	9/20/01	x	x	.x	x		x	x	x	
LNAPL	12-A	RFI-12-02(051601)NL	5/16/01	x	x	x	x		x	x	x	
LNAPL	12-B	RFI-12-09(061301)NL	6/13/01	x	x	x	x		x	x	x	
LNAPL	16-C	Tank	5/18/01	x	x	x	x		x	x	x	Tank 113 Contents
LNAPL	16-C	RFI-16-04(052901)NL	5/29/01	x	x	x	x					Analyzed as an aqueous sample
LNAPL	16-C	RFI-16-10(072701)NL	7/27/01	x	x	x	x		x	x	x	

1. AOI = area of interest
2. VOC = volatile organic compounds
3. SVOC = semivolatile organic compounds
4. PCB = polychlorinated biphenyls
5. Inorg = inorganic constituents
6. TPH = total petroleum hydrocarbons
7. * Analyses were completed for the VOC, SVOC, PCB, and/or Inorganic suite of compounds/constituents included in ths QAPP defined project analyte list.

TABLE 2-6

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

MEASURED NAPL THICKNESS SUMMARY

Well	Maximum LNAPL Thickness (Feet)	Minimum LNAPL Thickness (Feet)
Factory 03 Area (April 2001 - March 2002)		
03-03	2.07	0.01
Building 87/Leith Street Overpass (October 2001 - March 2002)		
RFI-86-03	0.13	0.00
MW-FP7	0.00	0.00
Former Tank Farm 37 (July 2001 - March 2002)		
20-502	2.57	0.39
20-503	1.77	0.12
20-RW-North	0.05	0.01
20-RW-South	0.06	0.01
RFI-36-13	0.00	0.00
Factory 10 Area (January 2001 - March 2002)		
20-162	0.47	0.23
20-FP3	1.27	1.27
20-FP4	1.72	0.01
20-FP6	0.70	0.00
20-FP7	0.99	0.10
20-FP8	2.37	0.19
RW1-P1	2.93	0.06
RW1-P2	5.54	0.09
Factory 05 Area (April 2001 - March 2002)		
43-160	1.60	0.01
43-161	4.82	0.01
43-162	7.96	0.00
43-163	3.36	0.33
43-164	1.34	0.01
43-165	7.96	0.38
43-RW-East	4.02	1.30
43-RW-West	2.77	0.54
43-RW-South	0.00	0.00
RFI-05-11	3.37	0.00
RFI-05-13	3.90	3.64
RFI-05-14	2.18	1.13
RFI-05-21	0.01	0.00
Factory 81 Area (April 2001 - March 2002)		
70-101	3.37	0.01
70-103	1.66	0.01
70-108	1.39	0.01
Factory 36 Area (January 2001 - March 2002)		
36-160	1.50	0.01
36-FP3	2.78	0.09
36-FP4	0.30	0.00
36-FP6	8.75	0.17
36-FP7	3.44	0.30
RFI-36-06	3.84	0.72
RFI-36-07	2.29	0.68

TABLE 2-6

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

MEASURED NAPL THICKNESS SUMMARY

Well	Maximum LNAPL Thickness (Feet)	Minimum LNAPL Thickness (Feet)
RFI-36-15	4.72	4.72
RFI-36-16	5.35	1.75
RFI-36-21	3.02	0.18
RFI-36-22	3.19	0.39
RFI-36-23	0.00	0.00
RFI-36-26	0.00	0.00
RFI-36-27	0.00	0.00
RFI-36-29	0.00	0.00
Hamilton Avenue Tank Farm Area (April 2001 - March 2002)		
31-7	5.26	0.00
Building 12 (August 2001 - October 2001)		
RFI-12-02	1.70	1.02
RFI-12-05	1.50	0.00
RFI-12-11D	0.42	0.00
RFI-12-11S	0.00	0.00
RFI-12-14	0.03	0.01
RFI-12-15	0.23	0.23
Factory 83/84 (October 2001 - March 2002)		
RFI-83/84-03	2.13	1.39
RFI-83/84-06	1.98	0.95
RFI-83/84-07	1.91	0.32
Building 16/40 (October 2001 - March 2002)		
RFI-16-01	0.00	0.00
RFI-16-04	0.00	0.00
RFI-16-07	0.01	0.00
RFI-16-08	0.74	0.00
RFI-16-09	0.01	0.00
RFI-16-10	1.33	0.00
RFI-16-11	0.00	0.00
RFI-16-21	0.00	0.00

Table 3-1

General Motors Corporation
NAO Flint Operations Site - Flint, Michigan
RFI Phase I Investigation Report

Geotechnical Data Summary

Sample Section ID Interval Sampled Date of Collection	Material Description	Type of Sample	USCS Code	Moisture Content %	Dry Density PCF	Organic Content %	Hydraulic Conductivity cm/sec
RFI-05-09(9-13) 9-11 8/2/01	Poorly graded SAND with Silt	Bagged	SP-SM	25.9	142.8	1.8	NA
RFI-05-09(9-13) 11-13 8/2/01	Poorly graded SAND	Bagged	SP	25.1	108.1	1.3	NA
RFI-05-09(27-33) 27-29 8/2/01	Sandy, Silty CLAY	Jarred	CL-ML	9.9	117.4	7.1	NA
RFI-05-09(27-33) 31-33 8/2/01	Sandy, Silty CLAY	Jarred	CL-ML	8.9	136.0	5.2	NA
RFI-07-08(22-26) 21.5-23.5[1] 7/30/01	Lean CLAY with Sand	Bagged	CL	11.4	111.8	8.3	NA
RFI-07-08(22-26) 23.5-25.5[2] 7/30/01	Silty SAND	Jarred	SM	10.5	64.6	5.9	NA
RFI-36-01(20-24) 20-22 8/21/01	Lean CLAY with Sand	Shelby Tube	CL-ML	20.1	NA	7.2	NA see Note 3
RFI-36-01(20-24) 22.2-23 8/21/01	Poorly graded SAND with Silt	Bagged	SP-SM	19.6	80.9	4.4	NA
RFI-36-01(20-24) 23-24 8/21/01	Poorly graded SAND with Silt	Bagged	SP-SM	23.7	125.1	3.9	NA
RFI-36-01(39-42) 38.5-39.5 8/21/01	Silty SAND	Bagged	SM	9.1	119.5	5.7	NA
RFI-36-01(39-42) 40.0-40.5 8/21/01	Silty CLAY with Sand	Shelby Tube	CL-ML	13.1	126.5	8.4	7.9×10^{-8}
RFI-36-01(39-42) 41-42 8/21/01	Silty, Clayey SAND	Bagged	SC-SM	11.7	111.5	3.7	NA
RFI-55-01(10-14) 8.5-10.5 8/3/01	Silty SAND	Shelby Tube	SM	17.0	NA	6.9	NA see Note 3
RFI-55-01(10-14) 12.5-14.5 8/3/01	Silty SAND	Bagged	SM	21.7	96.5	3.0	NA
RFI-55-01(35-37) 35-36 8/3/01	Silty CLAY with Sand	Jarred	CL-ML	8.1	83.3	4.6	NA
RFI-55-01(35-37) 36-37 8/3/01	Silty CLAY with Sand	Shelby Tube	CL-ML	8.2	106.7	5.3	NA see Note 3
RFI-55-01(35-37) 36-37 8/3/01	Sandy lean CLAY	Jarred	CL-ML	10.3	NA	6.0	NA

Table 3-1

General Motors Corporation
NAO Flint Operations Site - Flint, Michigan
RFI Phase I Investigation Report

Geotechnical Data Summary

Sample Section ID Interval Sampled Date of Collection	Material Description	Type of Sample	USCS Code	Moisture Content %	Dry Density PCF	Organic Content %	Hydraulic Conductivity cm/sec
RFI-94-02(14-17) 14-16 8/30/01	Silty, Clayey SAND	Bagged	SM	8.6	138.1	7.9	NA
RFI-94-02(14-17) 15.5-17.5 8/30/01	Silty SAND	Bagged	SM	7.6	146.7	8.0	NA
RFI-94-02(18-20) 17.5-17.8 8/30/01	Silty, Clayey SAND	Shelby Tube	SC-SM	10.6	NA	7.4	NA see Note 3
RFI-94-02(18-20) 17.5-18.5 8/30/01	Silty SAND	Bagged	SM	6.4	102.9	4.4	NA
RFI-94-02(18-20) 18-20 8/30/01	Silty, Clayey SAND	Bagged	SC-SM	7.3	166.6	5.2	NA

Notes:

1. Sample was split from original and submitted separately in a bag.
2. Sample was split from original sample interval and submitted seperately in a jar.
3. Sample recovery from Shelby Tube locations RFI-36-01 (20-24), RFI-55-01 (10-14), RFI-55-01 (35-37), and RFI-94-02 (18-20) were not sufficient to allow laboratory hydraulic conductivity analysis.

CL=Clays (mineral), low plasticity; ML=Mineral Silts, low plasticity; SC=Sands, clayey plastic, fines; SP=Sands, poorly graded; SM=Sands, mixed-plastic, fines.

PCF=pounds per cubic foot

NA=Not Analyzed

USCS=Unified Soil Classification System

TABLE 3-2

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

GROUNDWATER AND LNAPL ELEVATION DATA

Well ID	Reference Point Elevation (feet)	LNAPL Density (assumed)	April 3-4, 2001					September 10-11, 2001				
			LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL
03-02	743.24			4.28	738.96				4.15	739.09		
03-3	747.01	0.92	0.96	12.81	734.20	11.85	735.08	0.05	11.99	735.02	11.94	735.07
03-101	--								10.17	NA		
03-109	747.40			10.21	737.19				10.43	736.97		
03-110	746.95			7.70	739.25							
03-111	744.70			4.91	739.79				5.46	739.24		
03-112	747.21			6.02	741.19							
03-114	746.49			11.98	734.51				11.94	734.55		
04-1	731.03								4.88	726.15		
04-2	730.37			6.45	723.92				6.55	723.82		
04-3	730.19			7.62	722.57				7.58	722.61		
04-4	--								7.78	NA		
04-5	730.69			8.43	722.26				8.64	722.05		
04-120	750.52			10.59	739.93				11.47	739.05		
04-121	752.12			18.99	733.13				19.44	732.68		
04-140	751.06			17.07	733.99				17.16	733.90		
04-160	729.13			14.16	714.97				14.00	715.13		
07-01	--			16.10	NA				16.08	NA		
07-02	727.47			8.40	719.07				8.93	718.54		
11-120	747.44			9.15	738.29							
11-140	741.78			15.35	726.43				14.88	726.90		
20-100	750.80			8.91	741.89				9.70	741.10		
20-102	752.30								10.52	741.78		
20-103N	751.69			9.94	741.75				11.10	740.59		
20-103S	751.67			9.91	741.76							
20-105R	--											
20-120	749.45			8.00	741.45				8.02	741.43		

See Notes on Page 10.

TABLE 3-2

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

GROUNDWATER AND LNAPL ELEVATION DATA

Well ID	Reference Point Elevation (feet)	LNAPL Density (assumed)	April 3-4, 2001					September 10-11, 2001				
			LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL
20-121	753.25			11.93	741.32				11.87	741.38		
20-122	752.40			12.34	740.06				11.97	740.43		
20-141	753.25			8.75	744.50							
20-143	749.25			9.36	739.89							
20-144	749.90											
20-145	749.34			9.90	739.44				9.49	739.85		
20-160	752.81			11.47	741.34				11.78	741.03		
20-162	753.48	0.94	0.45	12.71	740.77	12.26	741.19	0.47	12.68	740.80	12.21	741.24
20-163	750.44	0.94	0.00	10.32	740.12	10.32	740.12					
20-164	751.14	0.94	0.01	12.61	738.53	12.60	738.54		9.37	741.77		
20-165	749.97			12.40	737.57							
20-167	753.34			12.79	740.55							
20-168	753.44	0.94		13.41	740.03			0.01	13.14	740.30	13.13	740.31
20-169	--	0.94		13.42	NA	7.43	NA		13.14	NA		
20-170	748.22			7.44	740.78				9.02	739.20		
20-500	750.63			8.97	741.66				9.65	740.98		
20-501	750.63			8.75	741.88							
20-504	749.74			8.59	741.15				9.41	740.33		
20-505S	750.54			10.46	740.08							
20-FP-1	752.17	0.94	0.01	11.30	740.87	11.29	740.88		11.49	740.68		
20-FP-10	747.25			5.58	741.67				7.60	739.65		
20-FP-11	743.97			3.50	740.47				4.63	739.34		
20-FP-12	742.51			2.51	740.00							
20-FP-2	--								9.62	NA		
20-FP-5	748.82			7.20	741.62				8.00	740.82		
20-FP-6	747.91			7.75	740.16				8.69	739.22		

See Notes on Page 10.

TABLE 3-2

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

GROUNDWATER AND LNAPL ELEVATION DATA

Well ID	Reference Point Elevation (feet)	LNAPL Density (assumed)	April 3-4, 2001					September 10-11, 2001				
			LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL
20-FP-7	748.53	0.94	0.35	9.15	739.38	8.80	739.71	0.44	9.09	739.44	8.65	739.85
20-FP-8	748.73	0.94	0.69	8.54	740.19	7.85	740.84	0.67	9.65	739.08	8.98	739.71
20-FP-9	749.45			8.57	740.88				9.11	740.34		
30-100	747.24			10.66	736.58				10.32	736.92		
30-120	747.48			6.34	741.14				6.58	740.90		
30-140	745.88			9.04	736.84				6.28	739.60		
31-1	735.19			8.91	726.28							
31-2	733.97			7.51	726.46							
31-3	734.44			8.49	725.95							
31-4D	733.87	0.92	0.05	8.66	725.21	8.61	725.26					
31-4S	733.90	0.92	0.02	7.13	726.77	7.11	726.79					
31-5	736.12			10.44	725.68				10.57	725.55		
31-6	734.54			8.30	726.24				8.09	726.45		
31-7	729.75	0.92	3.92	10.63	719.12	6.71	722.73					
31-8	730.26			8.53	721.73				8.67	721.59		
36 FP1	--								12.52	NA		
36 FP2	750.30			12.69	737.61				12.64	737.66		
36 FP3	749.41	0.88	0.80	12.35	737.06	11.55	737.76					
36 FP5	--			16.18	NA				16.09	NA		
36 FP6	749.51	0.88	3.77	13.30	736.21	9.53	739.53	3.02	12.24	737.27	9.22	739.93
36 FP7	750.02	0.88	3.30	15.60	734.42	12.30	737.32					
36 FP8	748.83			8.10	740.73				8.35	740.48		
36-100	750.54			13.34	737.20				13.34	737.20		
36-101	750.11			14.11	736.00				14.33	735.78		
36-120	754.47			12.62	741.85				13.33	741.14		
36-121	753.79			17.04	736.75				16.88	736.91		
36-160	750.12	0.88	5.12	16.78	733.34	11.66	737.85					

See Notes on Page 10.

TABLE 3-2

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

GROUNDWATER AND LNAPL ELEVATION DATA

Well ID	Reference Point Elevation (feet)	LNAPL Density (assumed)	April 3-4, 2001					September 10-11, 2001				
			LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL
37-01	750.37			9.33	741.04				10.85	739.52		
38-120	748.43			14.01	734.42				14.10	734.33		
40-1	733.43			4.14	729.29				3.40	730.03		
40-2	736.47			7.38	729.09				7.88	728.59		
40-3	737.01			18.25	718.76				18.23	718.78		
40-301	732.05			8.20	723.85				8.72	723.33		
40-302	732.96			7.51	725.45				7.35	725.61		
40-303	729.41			4.09	725.32							
40-304	731.11			2.81	728.30				2.72	728.39		
40-305	731.24			5.02	726.22				4.31	726.93		
40-4R	--											
40-5	735.84	0.92	0.02	6.16	729.68	6.14	729.70		9.28	726.56		
40-6	735.53			6.45	729.08				7.17	728.36		
40-07	733.63											
43-100	753.07			11.84	741.23				11.63	741.44		
43-101R	--											
43-102	752.63			10.15	742.48							
43-103	752.10			8.89	743.21				8.91	743.19		
43-140	750.14			9.70	740.44				9.80	740.34		
43-141	752.78			12.30	740.48				12.60	740.18		
43-160	750.43	0.92	1.95	11.34	739.09	9.39	740.88	0.38	9.82	740.61	9.44	740.96
43-161	750.19	0.92	1.92	11.20	738.99	9.28	740.76	0.25	9.56	740.63	9.31	740.86
43-162	749.90	0.92	2.24	11.14	738.76	8.90	740.82	1.95	10.76	739.14	8.81	740.93
43-163	749.65	0.92	3.59	11.84	737.81	8.25	741.11	0.48	9.08	740.57	8.60	741.01
43-164	749.59	0.92	0.75	9.12	740.47	8.37	741.16	0.06	8.62	740.97	8.56	741.03
43-165	749.41	0.92	5.55	13.33	736.08	7.78	741.19	3.48	11.74	737.67	8.26	740.87

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TABLE 3-2

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

GROUNDWATER AND LNAPL ELEVATION DATA

Well ID	Reference Point Elevation (feet)	LNAPL Density (assumed)	April 3-4, 2001					September 10-11, 2001				
			LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL
43-166	747.97			7.15	740.82				7.10	740.87		
43-167	748.43			7.90	740.53				7.71	740.72		
43-168	750.10			9.63	740.47				9.38	740.72		
43-169	750.32			9.56	740.76				9.39	740.93		
43-220	--								11.91	NA		
43-242	--			12.28	NA				12.54	NA		
55-1	753.43			10.66	742.77				11.80	741.63		
55-2	753.06			11.22	741.84				11.71	741.35		
55-3	753.52			11.44	742.08				11.39	742.13		
55-4	753.59			10.49	743.10				10.59	743.00		
55-5	753.94			12.34	741.60				12.31	741.63		
70-100	742.36			5.86	736.50				7.52	734.84		
70-101	742.68	0.92	1.58	4.80	737.88	3.22	739.33	0.95	5.83	736.85	4.88	737.72
70-102	742.75			3.90	738.85							
70-103	743.78	0.92	0.89	4.98	738.80	4.09	739.62	0.43	6.02	737.76	5.59	738.16
70-105	--								7.04	NA		
70-106	743.60								6.83	736.77		
70-107	742.58			6.86	735.72				7.45	735.13		
70-108	744.06	0.92	1.64	6.25	737.81	4.61	739.32	0.08	6.13	737.93	6.05	738.00
70-109	741.60			2.95	738.65				4.14	737.46		
70-160	739.41			9.83	729.58				9.98	729.43		
70-162	743.45			3.67	739.78							
70-163	742.59			3.92	738.67				5.18	737.41		
70-165	741.26			3.59	737.67				5.28	735.98		
84-4	727.25			7.53	719.72							
84-5	727.87			9.27	718.60							
84-6	726.49			11.78	714.71							

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GENERAL MOTORS CORPORATION
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GROUNDWATER AND LNAPL ELEVATION DATA

Well ID	Reference Point Elevation (feet)	LNAPL Density (assumed)	April 3-4, 2001					September 10-11, 2001				
			LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL
86-1	743.20			8.93	734.27							
86-100	740.05			6.38	733.67				17.34	722.71		
86-3	746.31								15.33	730.98		
87-FP1	715.79			2.20	713.59							
87-FP2	742.24								13.34	728.90		
87-FP3	739.07			10.49	728.58				10.83	728.24		
87-FP4	742.11			21.04	721.07							
87-FP5	741.01			11.27	729.74				11.57	729.44		
87-FPD3	742.05			13.05	729.00							
88-1	741.09			6.00	735.09							
88-2	741.37			7.10	734.27							
88-4	741.37			7.33	734.04							
88-5	742.01			7.75	734.26							
88-6	741.60			7.70	733.90							
88-7	742.20			6.35	735.85							
88-8	741.53			7.24	734.29							
88-9	741.86			8.18	733.68							
GM-1	724.64			11.42	713.22							
GM-10	725.79			12.55	713.24							
GM-12	738.62			22.50	716.12							
GM-2	725.40			11.28	714.12							
GM-3	725.54			12.28	713.26							
GM-4	738.12			24.45	713.67							
GM-5	737.05			23.35	713.70							
GM-7	739.81			25.70	714.11							
GM-8	738.71			22.47	716.24							
GM-9	724.39			11.16	713.23							

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GENERAL MOTORS CORPORATION
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RFI PHASE I REPORT

GROUNDWATER AND LNAPL ELEVATION DATA

Well ID	Reference Point Elevation (feet)	LNAPL Density (assumed)	April 3-4, 2001					September 10-11, 2001				
			LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL
MW-00-FP7	740.73			17.51	723.22							
MW-00-FP8	741.43			17.69	723.74							
OW-5	725.32			8.56	716.76							
P-1	751.11	0.92	3.50	14.80	736.31	11.30	739.53	0.65	11.01	740.10	10.36	740.70
P-2	751.30	0.92	4.66	15.55	735.75	10.89	740.04	5.51	15.20	736.10	9.69	741.17
RFI-02-05	738.88								4.97	733.91		
RFI-02-07	735.06								6.58	728.48		
RFI-02-08	735.82								8.61	727.21		
RFI-03-02	742.35								7.41	734.94		
RFI-03-03	742.01								2.45	739.56		
RFI-03-04	746.67								7.63	739.04		
RFI-05-01	750.38								9.72	740.66		
RFI-05-02	--								13.28	NA		
RFI-05-03	752.43								10.63	741.80		
RFI-05-04	--			11.95	NA				12.19	NA		
RFI-05-05	--			12.55	NA				12.70	NA		
RFI-05-06	752.13								11.63	740.50		
RFI-05-07	--			11.44	NA				11.85	NA		
RFI-05-10	--			13.23	NA				13.27	NA		
RFI-05-11	--	0.92						3.21	16.30	NA	13.09	NA
RFI-05-12	--			13.27	NA				12.83	NA		
RFI-05-13	--	0.92	3.84	16.25	NA	12.41	NA	0.05	12.73	NA	12.68	NA
RFI-05-14	--	0.92						2.05	14.95	NA	12.90	NA
RFI-05-19D	749.31								10.75	738.56		
RFI-05-19S	749.48								9.39	740.09		
RFI-05-20	750.41								9.90	740.51		

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TABLE 3-2

GENERAL MOTORS CORPORATION
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GROUNDWATER AND LNAPL ELEVATION DATA

Well ID	Reference Point Elevation (feet)	LNAPL Density (assumed)	April 3-4, 2001					September 10-11, 2001				
			LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL
RFI-05-21	748.73								8.06	740.67		
RFI-07-01	730.56								8.54	722.02		
RFI-07-03	726.74								5.59	721.15		
RFI-07-08	728.12								12.91	715.21		
RFI-09-06	727.66								6.33	721.33		
RFI-09-07	727.51								7.86	719.65		
RFI-09-08	728.45								9.34	719.11		
RFI-09-09	728.20								6.88	721.32		
RFI-10-01	749.11								8.34	740.77		
RFI-10-02	750.54								8.06	742.48		
RFI-10-03	751.79								10.46	741.33		
RFI-10-04	750.64								9.30	741.34		
RFI-10-05	751.59								10.73	740.86		
RFI-10-06	752.17								11.17	741.00		
RFI-10-08	750.79								9.57	741.22		
RFI-10-11	746.14								6.11	740.03		
RFI-10-12	750.35								8.70	741.65		
RFI-10-15	751.25								9.97	741.28		
RFI-12-11D	742.09	0.92						0.42	14.43	727.66	14.01	728.05
RFI-12-11S	742.17								7.07	735.10		
RFI-12-14	742.15								23.25	718.90		
RFI-12-15	742.13								10.15	731.98		
RFI-16-01	736.10								9.97	726.13		
RFI-16-04	732.27								7.82	724.45		
RFI-16-07	733.26								6.27	726.99		
RFI-23-01	742.19								6.76	735.43		
RFI-23-02	740.37								6.68	733.69		

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TABLE 3-2

GENERAL MOTORS CORPORATION
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GROUNDWATER AND LNAPL ELEVATION DATA

Well ID	Reference Point Elevation (feet)	LNAPL Density (assumed)	April 3-4, 2001					September 10-11, 2001				
			LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL
RFI-36-03	--			13.03	NA				13.63	NA		
RFI-36-04	756.14			18.80	737.34				18.64	737.50		
RFI-36-05	755.07			17.69	737.38				17.60	737.47		
RFI-36-07	753.94											
RFI-36-08	749.29								9.30	739.99		
RFI-36-09	750.78								10.33	740.45		
RFI-36-10	750.21								9.64	740.57		
RFI-36-11	752.89	0.88		12.55	740.34				12.59	740.30		
RFI-36-12	753.52	0.88		11.76	741.76				11.90	741.62		
RFI-36-15	754.47	0.88	4.58	19.07	735.40	14.49	739.43					
RFI-36-17	753.93								17.37	736.56		
RFI-36-18	753.12								16.27	736.85		
RFI-36-19	753.31								15.69	737.62		
RFI-36-20	757.01								19.11	737.90		
RFI-36-21	754.72	0.88		17.11	737.61			0.98	17.88	736.84	16.90	737.70
RFI-36-22	754.28	0.88		15.58	738.70			2.44	16.26	738.02	13.82	740.17
RFI-36-23	754.09	0.88						2.60	17.02	737.07	14.42	739.36
RFI-36-24	753.92	0.88						2.48	15.89	738.03	13.41	740.21
RFI-36-29	753.86								15.19	738.67		
RFI-36-31	753.51	0.88						2.99	16.37	737.14	13.38	739.77
RFI-36-32	756.28	0.88						3.74	22.60	733.68	18.86	736.97
RFI-38-04	751.58								19.15	732.43		
RFI-38-05	750.79								18.10	732.69		
RFI-38-06	749.43								15.41	734.02		
RFI-44-04	731.89								6.25	725.64		
RFI-44-05	731.97								9.61	722.36		
RFI-55-01	751.85								10.70	741.15		

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TABLE 3-2

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
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GROUNDWATER AND LNAPL ELEVATION DATA

Well ID	Reference Point Elevation (feet)	LNAPL Density (assumed)	April 3-4, 2001					September 10-11, 2001				
			LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation	Depth to LNAPL (feet)	Groundwater Elevation corrected for LNAPL
RFI-55-02	752.88								8.89	743.99		
RFI-55-09	753.75								12.27	741.48		
RFI-65-01	742.82								6.48	736.34		
RFI-81-02	745.92								15.43	730.49		
RFI-81-03	745.70								14.45	731.25		
RFI-81-08	741.43								10.72	730.71		
RFI-81-09	745.89								13.63	732.26		
RFI-81-11	740.34								6.73	733.61		
RFI-81-13	744.61								11.75	732.86		
RFI-81-22	--								6.28	NA		
RFI-83/84-01	741.34								4.55	736.79		
RFI-83/84-02	741.59								6.68	734.91		
RFI-83/84-11	741.61								7.64	733.97		
RFI-85-03	746.21								14.74	731.47		
RFI-85-05	745.95								21.80	724.15		
RFI-85-06	742.43	0.92						0.01	13.21	729.22	13.20	729.23
RFI-86-01	--								21.89	NA		
RFI-86-03	736.62								8.02	728.60		
RFI-86-04	737.29								3.99	733.30		
RFI-86-05	742.47								11.36	731.11		
RFI-86-06D	737.21								17.18	720.03		
RFI-86-06S	737.32								12.31	725.01		
RW-6-P1	--								12.51	NA		
RW-7-P1	753.23								12.69	740.54		
Dort Bridge	722.95								15.15	707.80		
Fifth Bridge	720.33								12.65	707.68		
Hamilton Bridge	722.61								14.90	707.71		

Notes:
Groundwater elevation relative to the NGVD of 1929.
-- = Not Available.
NA = Not Applicable - cannot be calculated without a reference point elevation.

TABLE 5-1

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

SUMMARY OF RFI ACTIVITIES, RESULTS, AND INVESTIGATION STATUS

AOI ID	AOI Description	Summary of Primary Materials Managed	RFI Activities	Analytical Results Exceeding Part 201 Screening Criteria				Additional Activities Proposed?	
				Soil (maximum concentration detected, mg/kg)	Screening Criteria (mg/kg)	Groundwater (maximum concentration detected, µg/L)	Screening Criteria (µg/L)	Soil	GW
Building 38 Area									
38-1	Northern portion of Building 38, including several process waste sumps, trenches, former car lifts, and a former 8,000-gallon fuel oil UST.	Hydraulic oils and process waste oils.	•Installed 6 soil borings •Installed 3 monitoring wells •Sampled 2 existing monitoring wells	No exceedences	--	Beryllium (34) Thallium (4.9)	IDW (4.0) IDW (2.0)	NFA	GW
Factory 36 Area									
36-1	Northern and central portions of Building 36, involving various active engine manufacturing process, including various "wet" (i.e., use of cutting and/or cooling oils) and "dry" (i.e., no use of cutting and/or cooling oils) metal machining operations. Due to the nature of the operations (i.e., full production), it is difficult to visually assess whether releases have occurred.	Hydraulic oils, cooling/cutting oils, and process waste oils.	•Installed 32 soil borings •Installed 19 monitoring wells •Sampled 4 existing monitoring wells •Collected 3 LNAPL samples	Benzene (240) Ethylbenzene (680) Toluene (4,100) Xylenes (total) (2,500)	IVSICI(45) ISVIA(8.4) IDC(140) ISVIA(140) IDC(250) IVSICI(3,300) ISVIA(250) IDC(150) ISVIA(150)	1,1,1-Trichloroethane (950) 1,1-Dichloroethene (120) cis-1,2-Dichloroethene (150) Trichloroethene (99) Benzene (6,000) Ethylbenzene (1,300) Toluene (20,000) Vinyl chloride (74) Arsenic (81) Beryllium (30) Chromium (220) Vanadium (210)	IDW(200) IDW(7.0) IDW(70) IDW(5.0) IDW(5.0) IDW(700) IDW(1,000) IDW(2.0) IDW(50) IDW(4.0) IDW(100) IDW(62)	BRA	GW
36-2	Basement area located along the east side of the central portion of Building 36, involving a former metal chip processing operation used to separate residual cutting and cooling oils from metal machining chips. Free-floating product is located immediately downgradient of this basement area.	Process waste oils.	•Installed 4 soil borings •Collected 3 surface soil samples •Installed 2 monitoring wells •Sampled 2 existing monitoring wells	Chromium (450)	IPSIC(240)	Benzene (4,000) Vinyl chloride (2.7) Arsenic (170)	IDW(5.0) IDW(2.0) IDW(50)	NFA	BRA IM
36-3	Basement area located beneath the southeastern corner of Building 36, involving a final engine assembly area, several ancillary, main process waste oil collection/processing operations, and several former USTs. The former USTs ranged in size from 300 to 12,000 gallons, and contained gasoline, diesel fuel, and/or process waste oils. Oil has been historically observed on the floor of the basement at various locations.	Process waste oils.	•Installed 5 soil borings •Installed 5 monitoring wells •Collected 2 grab water samples from basement area	No exceedences	--	1,1-Dichloroethene (10) cis-1,2-Dichloroethene (1,000) Benzene (590) Tetrachloroethene (150) Toluene (2,800) Trichloroethene (360) Vinyl chloride (140) Beryllium (8.1) Chromium (190) Vanadium (380)	IDW(7.0) IDW(70) IDW(5.0) IDW(5.0) IDW(1,000) IDW(5.0) IDW(2.0) IDW(4.0) IDW(100) IDW(62)	NFA	GW
36-4	Southcentral and southwestern portions of the Building 36, involving a former "wet" (i.e., use of cutting and/or cooling oils) metal machining operation and several active engine assembly operations. Trenches associated with these operations routinely contain standing oil, and the integrity of such trenches is unknown.	Cooling/cutting oils, and process waste oils.	•Installed 2 soil borings •Installed 2 monitoring wells	No exceedences	--	No exceedences	--	NFA	NFA

TABLE 5-1

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

SUMMARY OF RFI ACTIVITIES, RESULTS, AND INVESTIGATION STATUS

AOI ID	AOI Description	Summary of Primary Materials Managed	RFI Activities	Analytical Results Exceeding Part 201 Screening Criteria				Additional Activities Proposed?	
				Soil (maximum concentration detected, mg/kg)	Screening Criteria (mg/kg)	Groundwater (maximum concentration detected, µg/L)	Screening Criteria (µg/L)	Soil	GW
36-5	Area located immediately south of AOI 36-5 involving a former UST farm and active AST farm, as well as a 6' wide x 6' high subsurface tunnel which connected the former UST farm with Building 36. The ASTs and former USTs range(d) in size from 6,000 to 15,000 gallons, and contain(ed) gasoline, motor oil, hydraulic oil, mineral seal oil, naphtha, and various cooling/cutting oils. A prior release(s) from the UST farm in this area has been documented, and floor staining has been observed in the tunnel.	Gasoline, motor oil, hydraulic oils, and solvents.	•Installed 2 soil borings •Installed 2 monitoring wells •Sampled 4 existing monitoring wells •Collected 1 LNAPL sample	No exceedences	--	1,1,1-Trichloroethane (310) Trichloroethene (44) Vinyl chloride (6.2) Beryllium (6.9) Manganese (3,700) Nickel (170)	IDW(200) IDW(5.0) IDW(2.0) IDW(4.0) IDW(2,500) IDW(100)	NFA	GW IM
Buildings 55, 55A, and 55B Area									
55-1	Overall area of the Site's process wastewater treatment facilities, involving various waste oil storage facilities, clarifiers, mixing tanks, etc. Past investigations of this area have indicated impacts to underlying soil and groundwater, presumably resulting from a release(s) from these facilities.	Process waste oils.	•Installed 11 soil borings •Installed 4 monitoring wells •Sampled 6 existing monitoring wells	No exceedences	--	1,2-Dichloropropane (130) Benzene (10) Trichloroethene (44) Vinyl chloride (28) bis(2-chloroethyl)ether (23) Arsenic (58)	IDW(5.0) IDW(5.0) IDW(5.0) IDW(2.0) IDW(8.3) IDW(50)	NFA	GW
Factory 10 Area									
10-1	Overall area of Building 20, including its basement areas, manufacturing operations, external areas immediately surrounding the building, and several existing and former ASTs ranging in size from 1,000 to 20,000 gallons. The ASTs contain(ed) various lubricating oils, automatic transmission fluid, solvents, and process waste oils. Past investigations of the Building 20 Area have indicated impacts to underlying soil and groundwater resulting from releases from associated operations.	Hydraulic oils and process waste oils.	•Installed 6 soil borings •Installed 1 monitoring well •Sampled 6 existing monitoring wells	Chromium (750) Lead (2,200) Manganese (3,000)	IPSIC(240) IDC(900) IPSIC(1,500)	1,1,1-Trichloroethane (210) 1,1-Dichloroethene (13) cis-1,2-Dichloroethene (250) Vinyl chloride (3.2) Barium (28,000)	IDW(200) IDW(7.0) IDW(70) IDW(2.0) IDW(2,000)	BRA	GW IM BRA
10-2	Solid waste transfer station located east of Building 20 and south of Buildings 22 and 24. Two 200,000-gallon ASTs containing process waste oils and #2 fuel oil were formerly present in this area. Residual oil draining from solid waste stored in the solid waste transfer station occasionally collects on the concrete pavement of this area, which has numerous cracks and fissures. Residual oil is recovered via a centrally located pit that is routinely emptied.	Process waste oils.	•Installed 11 soil borings •Installed 8 monitoring wells	Manganese (1,800)	IPSIC(1,500)	1,1,1-Trichloroethane (580) 1,1-Dichloroethene (110) Benzene (17) Chloroethane (2,600) cis-1,2-Dichloroethene (150) Methylene chloride (24) Trichloroethene (150) Vinyl chloride (60) Arsenic (68) Manganese (3,400)	IDW(200) IDW(7.0) IDW(5.0) IDW(1,700) IDW(70) IDW(5.0) IDW(5.0) IDW(2.0) IDW(50) IDW(2,500)	BRA	BRA

TABLE 5-1

GENERAL MOTORS CORPORATION
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RFI PHASE I REPORT

SUMMARY OF RFI ACTIVITIES, RESULTS, AND INVESTIGATION STATUS

AOI ID	AOI Description	Summary of Primary Materials Managed	RFI Activities	Analytical Results Exceeding Part 201 Screening Criteria				Additional Activities Proposed?	
				Soil (maximum concentration detected, mg/kg)	Screening Criteria (mg/kg)	Groundwater (maximum concentration detected, µg/L)	Screening Criteria (µg/L)	Soil	GW
10-3	Basement area of Building 22, including a 200-gallon AST which contained diesel fuel and two process waste oil sumps which collect oil leaks from compressors via floor drains, and the area immediately north of Building 22 (formerly used to manufacture Liberty Aircraft engines and more recently to store scrap USTs and ASTs following removal).	Hydraulic oils and process waste oils.	•Installed 9 soil borings •Installed 4 monitoring wells •Reinstalled 2 existing monitoring wells •Sampled 3 existing monitoring wells	Manganese (2,500)	IPSIC(1,500)	1,1,1-Trichloroethane (1,800) 1,1-Dichloroethane (5,900) Vinyl chloride (280) Beryllium (4.2)	IDW(200) IDW(2,500) IDW(2.0) IDW(4.0)	BRA	GW
10-4	Scrapyard area located immediately south of Building 20 used since 1950 for scrap material storage, vehicle dismantling, and vehicle equipment storage. Past investigations of this area have indicated impacts to underlying soil and groundwater resulting from releases from associated operations.	Process waste oils, cooling/cutting oils, and transmission and hydraulic oils.	•Installed 1 soil boring •Installed 1 monitoring well •Sampled 5 existing monitoring wells	No exceedences	--	Benzene (6.1) Vinyl chloride (2.3)	IDW(5.0) IDW(2.0)	NFA	BRA IM
Factory 05 Area									
05-1	Basement area located along the southeast portion of Building 43, involving a metal machining chip processing operation and several process wastewater system sumps and tanks. Free-floating product is located immediately adjacent to this basement area.	Cooling/cutting oils, and other process waste oils.	•Installed 5 soil borings •Installed 1 monitoring well •Sampled 3 existing monitoring wells	Lead (3,100) Manganese (2,400)	IDC(900) IPSIC(1,500)	No exceedences	--	BRA	IM
05-2	Central east portion of Building 43, involving a "Filtration Room," an "Oil Room," a below-grade vault, and an elevator pit. Over 2 feet of oil material has been noted on occasion within the below-grade vault in this area. The source of this material is unknown; however, it may be associated with the adjacent Oil Room and/or Filtration Room.	Process waste oils.	•Installed 2 soil borings •Installed 2 monitoring wells •Sampled 1 existing monitoring well	No exceedences	--	Trichloroethene (95) Vinyl chloride (6.0) Beryllium (5.6)	IDW(5.0) IDW(2.0) IDW(4.0)	NFA	BRA
05-3	Basement area of Building 43 beneath transmission component heat treating operations, containing a relatively large process waste oil sump, various other smaller sumps and drains, and intermittent pooling of oil on floor surfaces. Several former and existing ASTs and USTs are/were located along the east side of the building adjacent to the basement area. These ASTs and USTs ranged in size from 275 to 12,000 gallons, and contained quench oils, hydraulic oils, lubricating oils, gasoline, and diesel fuel.	Process waste oils.	•Installed 4 soil borings •Installed 4 monitoring wells •Reinstalled 1 existing monitoring well •Sampled 2 existing monitoring wells	No exceedences	--	Trichloroethene (29) Arsenic (84)	IDW(5.0) IDW(50)	NFA	BRA

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AOI ID	AOI Description	Summary of Primary Materials Managed	RFI Activities	Analytical Results Exceeding Part 201 Screening Criteria				Additional Activities Proposed?	
				Soil (maximum concentration detected, mg/kg)	Screening Criteria (mg/kg)	Groundwater (maximum concentration detected, µg/L)	Screening Criteria (µg/L)	Soil	GW
05-4	"Cold Former Room," involving various metal forming operations utilizing various process oils and other fluids and recirculation trenches and sumps.	Process waste oils.	•Installed 1 soil boring •Installed 1 monitoring well •Sampled 1 existing monitoring well	No exceedences	--	No exceedences	--	NFA	NFA
05-5	Northern portion of Building 43, involving various active process machinery, collection trenches, and sumps (both "wet" and "dry" operations). Due to the nature of the operations (i.e., full production), it is difficult to visually assess whether releases have occurred.	Cooling/cutting oils, process waste oils, and solvents.	•Installed 5 soil borings •Installed 2 monitoring wells •Sampled 1 existing monitoring well •Collected 1 LNAPL sample	No exceedences	--	Arsenic (70)	IDW(50)	NFA	BRA IM
05-6	Southern portion of Building 43, involving various active process machinery, collection trenches, and sumps (both "wet" and "dry" operations). Due to the nature of the operations (i.e., full production), it is difficult to visually assess whether releases have occurred. This AOI also includes the area south of Building 43 in the vicinity of Building 99.	Cooling/cutting oils, process waste oils, and solvents.	•Installed 11 soil borings •Installed 4 monitoring wells •Sampled 4 existing monitoring wells •Collected 2 LNAPL samples	Lead (3,500)	IDC(900)	cis-1,2-Dichloroethene (81) Trichloroethene (230) Vinyl chloride (19)	IDW(70) IDW(5.0) IDW(2.0)	BRA	GW
Factory 03 Area									
03-1	Overall area of the Factory 03 building complex, including various quenching and cooling oil systems utilized for various metal forging, quenching, and cooling operations, as well as various ancillary process waste sumps, process trenches, elevator pits, and process material storage areas. Past investigations of this area have indicated impacts to underlying soil and groundwater resulting from releases from associated operations.	Hydraulic oils, quench oils, and process waste oils.	•Installed 8 soil borings •Installed 4 monitoring wells •Sampled 7 existing monitoring wells •Collected 1 LNAPL sample	Manganese (3,500)	IPSIC(1,500)	Trichloroethene (64) Beryllium (43) Selenium (190)	IDW(5.0) IDW(4.0) IDW(50)	S BRA	BRA
Factory 81 Area									
81-1	Basement area beneath the southern and central portions of Building 71B, involving former foundry operations and three metal machining chip/cooling and cutting oil filtration/processing operations, as well as an inactive hydraulic elevator, several process waste oil sumps and tanks, a drum storage area, and an inactive hazardous waste storage area. Oils intermittently pool throughout the basement area.	Hydraulic oils, cooling/cutting oils, and process waste oils.	•Installed 5 soil borings •Installed 2 monitoring wells •Sampled 2 temporary wells	Lead (69,000)	IDC(900)	Vinyl chloride (12) Arsenic (83)	IDW(2.0) IDW(50)	BRA	GW BRA

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AOI ID	AOI Description	Summary of Primary Materials Managed	RFI Activities	Analytical Results Exceeding Part 201 Screening Criteria				Additional Activities Proposed?	
				Soil (maximum concentration detected, mg/kg)	Screening Criteria (mg/kg)	Groundwater (maximum concentration detected, µg/L)	Screening Criteria (µg/L)	Soil	GW
81-2	Area of active metal welding and machining and torque converter assembly operations performed in Buildings 70, 70B, 71, 72, 73, 73A, 73B, and 74 (both "wet" and "dry" operations), as well as area of former foundry operations performed in northern portion of Building 70 and areas of former "pig iron" and scrap steel storage immediately east of Buildings 70 and 73, respectively. Free-floating product is located immediately adjacent to Building 73.	Hydraulic oils, cooling/cutting oils, process waste oils, and oil-impregnated foundry sand.	•Installed 16 soil borings •Installed 3 monitoring wells •Sampled 2 temporary wells •Sampled 4 existing monitoring wells •Collected 1 LNAPL sample	Chromium (270) Lead (3,100) Manganese (1,800)	IPSIC(240) IDC(900) IPSIC(1,500)	Lead (19) Manganese (3,200)	IDW(4.0) IDW(2,500)	BRA	GW
81-3	Basement area of Building 70, involving former foundry operations, as well as an elevator pit along the west side of Building 70A, areas of "wet" metal machining operations in eastern portion of Building 73, and a forklift battery charging area in the northwest portion of Building 69. Floor staining noted within basement area; the integrity of basement floor is unknown.	Hydraulic oils, cooling/cutting oils , process waste oils, and acids.	•Installed 5 soil borings •Installed 4 monitoring wells •Sampled 1 temporary well •Sampled 1 existing monitoring well	No exceedences	--	Trichloroethene (11) Vinyl chloride (6.7) Barium (2,500) Lead (6.7)	IDW(5.0) IDW(2.0) IDW(2,000) IDW(4.0)	NFA	BRA
81-4	Basement areas of Buildings 69A and 69B, involving facility air compressor operations. Past operations within this basement involved the draining of oils from compressors onto the floor; the integrity of basement floor is unknown.	Compressor oils.	•Installed 1 soil boring •Installed 1 monitoring well	No exceedences	--	Tetrachloroethene (11)	IDW(5.0)	NFA	GW
81-5	A containment area for several existing and former ASTs. The ASTs range(d) in size from 2,500 to 20,000 gallons, and contain(ed) diesel fuel and automatic transmission fluid. The concrete secondary containment area associated with these tanks contain standing transmission fluid, and the integrity of this containment is unknown.	Automatic transmission fluids, fuel oils.	•Installed 1 soil boring •Sampled 1 temporary well	No exceedences	--	No exceedences	--	NFA	NFA
Buildings 21 and 97 Area									
21-1	Overall area of Building 21 and area immediately to the southeast of Building 21, involving former metal machining chip briquetting operations and current metal welding and tool grinding operations and heat treatment laboratories. The former briquetting operations purportedly involved the release of oils to soil surfaces in this area.	Cooling/cutting oils.	•Installed 4 soil borings •Installed 1 monitoring well •Sampled 3 temporary wells	No exceedences	--	Trichloroethene (12) Vinyl chloride (3.2) Pentachlorophenol (2.1) Manganese (9,200)	IDW(5.0) IDW(2.0) IDW(1.0) IDW(2,500)	NFA	BRA

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SUMMARY OF RFI ACTIVITIES, RESULTS, AND INVESTIGATION STATUS

AOI ID	AOI Description	Summary of Primary Materials Managed	RFI Activities	Analytical Results Exceeding Part 201 Screening Criteria				Additional Activities Proposed?	
				Soil (maximum concentration detected, mg/kg)	Screening Criteria (mg/kg)	Groundwater (maximum concentration detected, µg/L)	Screening Criteria (µg/L)	Soil	GW
Building 65 Area									
65-1	Overall area of Building 65, involving a main process waste pump station (Waste Station #5) for the Site's process wastewater treatment system. Oil has been historically observed on the floor of the basement at various locations.	Process waste oils.	•Installed 1 soil boring •Installed 1 monitoring well	No exceedences	--	Trichloroethene (42)	IDW(5.0)	NFA	BRA
Factory 83/84 Area									
83/84-1	Areas of various former and existing machining operations in Buildings 11, 32 (including two basements), and 66A/66D (both "wet" and "dry" operations). A prior release within Building 32 has been documented.	Hydraulic oils, process waste oils.	•Installed 3 soil borings •Installed 2 monitoring wells	No exceedences	--	No exceedences	--	NFA	NFA
83/84-2	Areas of various former and existing machining operations in Buildings 11, 32 (including two basements), and 66A/66D (both "wet" and "dry" operations). A prior release within Building 32 has been documented.	Hydraulic oils, process waste oils.	•Installed 14 soil borings •Installed 3 monitoring wells •Collected 1 LNAPL sample	Benzo(a)pyrene (66) Chromium (270) Lead (6,500) Manganese (3,500)	IDC(10) IPSIC(240) IDC(900) IPSIC(1,500)	cis-1,2-Dichloroethene (75) Vinyl chloride (69) Arsenic (100) Beryllium (23)	IDW(70) IDW(2.0) IDW(50) IDW(4.0)	S BRA	BRA IM
83/84-3	Areas of various former and existing machining operations in Buildings 11, 32 (including two basements), and 66A/66D (both "wet" and "dry" operations). A prior release within Building 32 has been documented.	Hydraulic oils, process waste oils.	•Installed 4 soil borings •Installed 1 monitoring well •Sampled 1 temporary well •Sampled 1 existing monitoring well	Lead (42,000)	IDC(900)	Beryllium (11) Lead (20)	IDW(4.0) IDW(4.0)	S BRA	BRA
83/84-4	Former "wet" metal machining operation in central portion of Building 66, including three process oil collection/recirculation sumps, and an inactive rail loading area and associated floor sumps along the north side of Building 66C. The floor of the loading area is saturated with oil, and the associated floor sumps still contain oil (integrity unknown).	Process waste oils.	•Installed 3 soil borings •Sampled 1 temporary well •Collected 1 LNAPL sample	No exceedences	--	Arsenic (55)	IDW(50)	NFA	BRA IM
83/84-5	Various inactive or former process trenches and pits and an inactive heat treating tunnel, all in Building 66. Many of these units still contain various oils and/or other process fluids, and the integrity of these units is unknown.	Process waste oils.	•Installed 3 soil borings •Sampled 1 temporary well	No exceedences	--	No exceedences	--	NFA	NFA
83/84-6	Forklift battery charging area and associated trench and pit in central portion of Building 83A (contain oil) and drum storage area in the southern portion of Building 83 used for metal-working fluids and corrosion inhibitors (floor staining).	Cooling/cutting oils, process waste oils, and battery acid.	•Installed 1 soil boring	No exceedences	--	No samples collected	--	NFA	NFA

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AOI ID	AOI Description	Summary of Primary Materials Managed	RFI Activities	Analytical Results Exceeding Part 201 Screening Criteria				Additional Activities Proposed?	
				Soil (maximum concentration detected, mg/kg)	Screening Criteria (mg/kg)	Groundwater (maximum concentration detected, µg/L)	Screening Criteria (µg/L)	Soil	GW
83/84-7	An area of several former USTs ranging in size from 3,000 to 12,000 gallons that contained gasoline, various cooling/cutting oils, quench oils, and lubricating oils. A prior release(s) from these tanks has been documented.	Gasoline, lubricants, quench oil, thinners.	•Installed 1 soil boring •Installed 1 monitoring well •Sampled 4 existing monitoring wells	No exceedences	--	Benzene (40) cis-1,2-Dichloroethene (88) Trichloroethene (35) Vinyl chloride (150)	IDW(5.0) IDW(70) IDW(5.0) IDW(2.0)	NFA	BRA
Buildings 15, 61, 61A, and 85 Area									
85-1	Elevator pit along the north-central side of Building 85, trenches related to engine test area in the eastern portion of Building 85, and a basement/vault area toward the center of Building 85. The integrity of these units is unknown.	Hydraulic and process waste oils.	•Installed 6 soil borings •Installed 6 monitoring wells •Sampled 1 temporary well •Collected 1 LNAPL sample	No exceedences	--	Tetrachloroethene (22) Trichloroethene (45) Beryllium (7.0) Selenium (80) Vanadium (130)	IDW(5.0) IDW(5.0) IDW(4.0) IDW(50) IDW(62)	NFA	BRA LNAPL
Buildings 86 and 86A Area									
86-1	Overall area of Building 86 and areas immediately southeast and west of Building 86, collectively involving a hazardous waste drum storage area, a process waste oil pump station (integrity unknown), a waste transport vehicle storage area (pavement staining; integrity unknown), a former 6,000-gallon UST containing gasoline, and a former UST farm which contained tanks ranging in size from 2,000 gallons to 12,000 gallons. The former USTs contained diesel fuel, mineral seal, and various cooling/cutting, and lubricating oils.	Gasoline and process waste and other oils.	•Installed 15 soil borings •Installed 8 monitoring wells •Sampled 2 temporary wells •Sampled 4 existing monitoring wells	Arsenic (110) Manganese (3,200)	IDC(61) IPSIC(1,500)	1,1-Dichloroethene (27) 1,2-Dichloroethane (5.4) Benzene (7.9) Chloroethane (14,000) cis-1,2-Dichloroethene (450) Methylene chloride (9.3) Tetrachloroethene (41) Trichloroethene (2,000) Vinyl chloride (280) Beryllium (9.8) Lead (10) Manganese (2,800)	IDW(7.0) IDW(5.0) IDW(5.0) IDW(1,700) IDW(70) IDW(5.0) IDW(5.0) IDW(5.0) IDW(2.0) IDW(4.0) IDW(4.0) IDW(2,500)	BRA	GW BRA
Building 07 Area									
07-1	Former coal yard immediately north of Building 07 (unlined) and several other process facilities (e.g., waste sludge dump station and waste sludge storage tanks) along north side of Building 07 (integrity unknown).	Process waste oils and coal yard residuals.	•Installed 5 soil borings •Installed 1 monitoring well •Sampled 2 temporary wells •Sampled 1 existing monitoring well	No exceedences	--	Vinyl chloride (3.3)	IDW(2.0)	NFA	GW BRA
07-2	Inactive lime "Slaker House" and adjacent inactive lime slurry tank adjacent to the southwest corner of Building 07 (integrity unknown).	Caustics.	•Installed 1 soil boring	No exceedences	--	No sample collecetd	--	NFA	NFA
07-3	Two elevator pits in the northcentral and southcentral portions of Building 07 and bulk sulfuric acid storage area in the southeast corner of Building 07 (integrity unknown).	Hydraulic oils and caustics.	•Installed 3 soil borings •Installed 1 monitoring well •Reinstalled 1 existing monitoring well •Sampled 1 temporary well	No exceedences	--	Beryllium (16)	IDW(4.0)	NFA	BRA

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				Soil (maximum concentration detected, mg/kg)	Screening Criteria (mg/kg)	Groundwater (maximum concentration detected, µg/L)	Screening Criteria (µg/L)	Soil	GW
Buildings 03, 17, 28, 84, and 94 Area									
94-A	Building 94 (southeast) sumps and trenches	Process waste oils	•Installed 1 soil boring •Sampled 1 temporary well	No exceedences	--	di-n-Butylphthalate (13)	GSI(9.7)	NFA	GW BRA
94-B	Building 94 (northeast) sump and trench	Process waste oils and battery acids	•Installed 1 soil boring	No exceedences	--	No sample collecetd	--	NFA	GW
94-C	Building 94 (central) sumps, trenches, lifts	Hydraulic oils and process waste oils	•Installed 2 soil borings •Sampled 2 temporary wells	No exceedences	--	Arsenic (52)	IDW(50)	NFA	BRA
94-D	Building 94A elevator pit	Hydraulic oils	•Installed 1 soil boring •Installed 1 monitoring well	No exceedences	--	No sample collected	--	NFA	GW
94-E	Building 03 car loading area	Hydraulic oils	•Installed 1 soil boring •Sampled 1 temporary well	No exceedences	--	No exceedences	--	NFA	NFA
84-A	Building 84 (south) pits, sumps, and lifts	Hydraulic oils, process waste oils,	•Installed 3 soil borings •Installed 1 monitoring well •Sampled 2 temporary wells	No exceedences	--	No exceedences (missing one sample)	--	NFA	GW
84-B	Building 84 (central) pits, sumps, basement	Hydraulic oils and process waste oils	•Installed 1 soil boring •Sampled 1 temporary well	No exceedences	--	No exceedences	--	NFA	NFA
84-C	Building 84 (north) pits, sumps, trenches	Process waste oils, waste gasoline, and	•Installed 1 soil boring •Sampled 1 temporary well	No exceedences	--	No exceedences	--	NFA	NFA
84-D	Former Building 84 Tank Farm	New and waste product gasoline,	•Installed 1 soil boring •Installed 1 monitoring well •Sampled 2 existing monitoring wells	No exceedences	--	Vinyl chloride (2.1) Chromium (450) Nickel (910)	IDW(2.0) IDW(100) IDW(100)	NFA	BRA
17-A	Building 17 elevator pit	Hydraulic oils	•Installed 2 soil borings •Installed 2 monitoring wells	No exceedences	--	Selenium (11) Silver (0.45)	GSI(5.0) GSI(0.20)	NFA	GW
Buildings 02, 12, 23, and 29 Area									
02-A	Building 02 sump	Process waste oils	•Installed 1 soil boring •Sampled 1 temporary well	No exceedences	--	No exceedences	--	NFA	NFA
02-B	Building 02 elevator pit	Hydraulic oils	•Installed 1 soil boring •Sampled 1 temporary well	No exceedences	--	Manganese (3,000)	IDW(2,500)	NFA	GW
02-C	Building 02 sump	Laboratory chemicals	•Installed 4 soil borings •Sampled 1 temporary well	Lead (2,000) Chromium (390)	IDC(900) IPSIC(270)	No exceedences	--	BRA	NFA
02-D	Building 02 machine pit	Hydraulic oils	•Installed 1 soil boring •Sampled 1 temporary well	No exceedences	--	No exceedences	--	NFA	NFA

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				Soil (maximum concentration detected, mg/kg)	Screening Criteria (mg/kg)	Groundwater (maximum concentration detected, µg/L)	Screening Criteria (µg/L)	Soil	GW
02-E	Former Tank 66	Gasoline	•Installed 1 soil boring •Installed 1 monitoring well	No exceedences	--	No exceedences	--	NFA	NFA
02-F	Building 02 hydraulic oil AST	Hydraulic oils	•Installed 2 soil borings •Installed 1 monitoring well	No exceedences	--	Manganese (3,700)	IDW(2,500)	NFA	GW
23-A	Building 23 basement process waste station	Process waste oils	•Installed 2 soil borings •Installed 2 monitoring wells	No exceedences	--	No exceedences	--	NFA	NFA
29-A	Elevator pit, floor staining	Hydraulic oils and cooling/cutting oils	•Installed 3 soil borings •Sampled 1 temporary well	Lead (1,500)	IDC(900)	No exceedences	--	BRA	NFA
12-A	Building 12 basement	Process waste oils and hydraulic oils	•Installed 12 soil borings •Sampled 6 temporary wells •Installed 2 monitoring wells •Collected 1 LNAPL sample	Lead (11,000)	IDC(900)	Tetrachloroethene (5.7) Vinyl chloride (40) Lead (7.9)	IDW(5.0) IDW(2.0) IDW(4.0)	BRA	GW BRA
12-B	Building 12 truck well sump	Process waste oils and grease	•Installed 4 soil borings •Sampled 1 temporary well •Installed 2 monitoring wells •Collected 1 LNAPL sample	Manganese (1,900)	IPSIC(1,500)	No exceedences	--	BRA	NFA LNAPL
12-C	Building 12 fork truck charging area	Process waste oils and battery acids	•Installed 1 soil boring •Sampled 1 temporary well	No exceedences	--	Vanadium (76)	IDW(62)	NFA	BRA
12-D	Building 12 abandoned utility tunnel	Process waste oils	•Installed 1 soil boring •Sampled 1 temporary well	No exceedences	--	No exceedences	--	NFA	NFA
Buildings 04, 08, 16, 40, and 44 Area									
04-A	Process waste room	Process waste oils and other fluids	•Installed 1 soil boring •Sampled 1 temporary well	No exceedences	--	cis-1,2-Dichloroethene (130) Trichloroethene (59)	IDW(70) IDW(5.0)	NFA	BRA
04-B	Elevator pits	Hydraulic oils	•Installed 2 soil borings •Sampled 2 temporary wells	No exceedences	--	No exceedences	--	NFA	NFA
04-C	Elevator pit	Hydraulic oils	•Installed 1 soil boring •Sampled 1 temporary well	No exceedences	--	No exceedences	--	NFA	NFA
04-D	Waste thinner tanks	Solvents and thinners	•Sampled 5 existing monitoring wells	No samples collected	--	No exceedences	--	NFA	NFA
16-A	Fluid filling station	Gasoline, transmission fluid, and other oils	•Installed 1 soil boring •Installed 1 monitoring well	No exceedences	--	No exceedences	--	NFA	NFA
16-B	Elevator pit	Hydraulic oils	•Installed 1 soil boring •Sampled 1 temporary well	No exceedences	--	No exceedences	--	NFA	NFA

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16-C	Former USTs	Fuel, hydraulic, and transmission oils	•Installed 19 soil borings •Installed 6 monitoring wells •Sampled 2 temporary wells •Collected 3 LNAPL samples	Vinyl chloride (0.16)	ISVIA(0.15)	Benzene (18) Trichloroethene (5.1) Beryllium (44) Lead (100) Selenium (180)	IDW(5.0) IDW(5.0) IDW(4.0) IDW(4.0) IDW(50)	NFA	GW BRA
16-D	UST and sump	Gasoline, process waste oils	•Installed 1 soil boring •Sampled 1 temporary well	No exceedences	--	No exceedences	--	NFA	NFA
40-A	USTs 67 through 74	Gasoline	•Installed 8 soil borings •Installed 2 monitoring wells •Reinstalled 2 existing monitoring wells •Sampled 1 temporary well •Sampled 2 monitoring wells •Sampled 4 existing monitoring wells	No exceedences	--	Benzene (1,900) Ethylbenzene (800) Arsenic (410) Beryllium (19) Cyanide (440)	IDW(5.0) IDW(700) IDW(50) IDW(4.0) IDW(200)	NFA	BRA LNAPL
40-B	Elevator pit	Hydraulic oils	•Installed 2 soil borings •Installed 1 monitoring well	No exceedences	--	Trichloroethene (18)	IDW(5.0)	NFA	GW BRA
40-C	Elevator pit	Hydraulic oils	•Installed 1 soil boring •Sampled 1 temporary well	No exceedences	--	Trichloroethene (52) Beryllium (18)	IDW(5.0) IDW(4.0)	NFA	GW BRA
40-D	Building 40 tunnel	Process waste and hydraulic oils	•Installed 2 soil borings •Installed 1 monitoring well •Reinstalled 1 existing monitoring well •Sampled 1 monitoring well •Sampled 5 existing monitoring wells •Collected grab sample from tunnel	No exceedences	--	Vinyl chloride (5.8) Lead (6.6)	IDW(2.0) IDW(4.0)	NFA	GW BRA
44-A	Building 44	Acids, caustics, hydraulic oils, paints and thinners, solvents, and process waste oils	•Installed 9 soil borings •Installed 3 monitoring wells •Sampled 3 temporary wells •Sampled 3 existing monitoring wells	Manganese (5,000)	IPSIC(1,500)	Benzo(a)anthracene (14) Benzo(a)pyrene (15) Benzo(b)fluoranthene (16) Benzo(g,h,i)perylene (7.9) Benzo(k)fluoranthene (14) Chrysene (16) Indeno(1,2,3-cd)pyrene (7.9) Total PCBs (1.1) Selenium (52)	IDW(8.5) GCC(9.4) IDW(5.0) GCC(5.0) IDW(5.0) GCC(5.0) IDW(5.0) GCC(5.0) IDW(5.0) GCC(5.0) IDW(5.0) GCC(5.0) IDW(5.0) GCC(5.0) IDW(0.50) IDW(50)	BRA	GW BRA

TABLE 5-1

GENERAL MOTORS CORPORATION
NAO FLINT OPERATIONS SITE - FLINT, MICHIGAN
RFI PHASE I REPORT

SUMMARY OF RFI ACTIVITIES, RESULTS, AND INVESTIGATION STATUS

AOI ID	AOI Description	Summary of Primary Materials Managed	RFI Activities	Analytical Results Exceeding Part 201 Screening Criteria				Additional Activities Proposed?	
				Soil (maximum concentration detected, mg/kg)	Screening Criteria (mg/kg)	Groundwater (maximum concentration detected, µg/L)	Screening Criteria (µg/L)	Soil	GW
Building 09 Area									
09-A	Building 09 area	Waste oils and other run-off materials from vehicle and equipment maintenance; fuel oils	•Installed 15 soil borings •Installed 3 monitoring wells •Sampled 2 temporary wells	Benzo(a)pyrene (57) Dibenzo(a,h)anthracene (11) Lead (120,000) Manganese (8,300)	IDC(10) IDC(10) IDC(900) IPSIC(1,500)	Trichloroethene (9.3) Vinyl chloride (3.8) Lead (26)	IDW(9.3) IDW(2.0) IDW(4.0)	S BRA	GW BRA
09-B	Former Building 31/Hamilton Avenue Tank Farm	Gasoline, solvents, and fuel oils	•Installed 14 soil borings •Installed 9 monitoring wells •Sampled 1 temporary well	No exceedences	--	Benzene (930) Total PCBs (1.7) Antimony (6.8) Arsenic (61) Lead (5.8) Selenium (52)	IDW(5.0) IDW(0.50) IDW(6.0) IDW(50) IDW(4.0) IDW(50)	NFA	GW BRA LNAPL
Aeration Lagoons Area									
WL	Former Aeration Lagoons Area		•Installed 6 soil borings •Sampled 3 temporary wells •Sampled 4 existing monitoring wells	No exceedences	--	No exceedences	--	NFA	NFA
Building 01 Area									
ACSP	Harriet Street Property Area		•Installed 17 soil borings •Sampled 4 temporary wells	No exceedences	--	Benzene (44)	IDW(5.0)	NFA	NFA
BD01	Building 01 (Administration Building) Area		•Installed 3 soil borings •Sampled 1 temporary well	No exceedences	--	Benzene (7.8)	IDW(5.0)	NFA	GW
Building 94 Employee Parking Lot Area									
BD01	Building 94 Employee Parking Lot		•Installed 5 soil borings •Sampled 2 temporary wells •Sampled 1 existing monitoring well	Total PCBs (6.9)	RDC(4.0)	No exceedences	--	S	NFA

Notes:

NFA - no further action
S - soil investigation
GW - groundwater sampling
BRA - baseline risk assessment
IM - LNAPL interim measure
LNAPL - LNAPL investigation