Office of Environmental Compliance
City of Saginaw Wastewater Treatment Facility
2406 Veterans Memorial Parkway
Saginaw, Michigan 48601-1268

City of Saginaw/Northwest Utilities Authority Sewer District
Discharge Permit Application/Comprehensive Industrial Wastewater Survey

The information provided in this survey/permit application will enable the City of Saginaw Wastewater Treatment Industrial Pretreatment Program to update files related to non-domestic sewer users in the City of Saginaw and Northwest Utilities Authority service area.

Please complete the Permit Application and return it within ninety (90) days to the Environmental Compliance Office. This survey/permit application is in accordance with the City of Saginaw Code of Ordinances Title V, Chapter 51:Sewer, Michigan Department of Environmental Quality (MDEQ) and the United States Environmental Protection Agency (USEPA) Industrial Pretreatment rules and regulations.

If you have any questions please contact the Environmental Compliance Office at (989) 759-1523.

The following websites contain information that may be helpful in filling out this permit.
City of Saginaw Code of Ordinances Title V, Chapter 51: Sewer
www.amlegal.com/library/mi/index.shtml

DEQ –Industrial Pretreatment web site
www.michigan.gov/deq
(Go to Department/ Water)

General Industrial Pretreatment Regulations, (40CFR403)
www.gpoaccess.gov/cfr/index.html

List of Standard Industrial Classification Codes (SIC)
www.sec.gov/info/edgar/siccodes.html

List of North American Industry Classification System (NAICS)
www.naics.com

Reference material included with this application:
1. Local limits
2. List of pollutants for analysis

SECTION A - GENERAL INFORMATION

1. Facility Name: GM Powertrain - Saginaw Malleable Iron

2. Facility Address:

Address	77 West Center
City, State & Zip	Saginaw, MI, 48605
Phone and Fax #	NA

3. Business Mailing Address: GM Remediation Team

Address	Engineering West, Mail Code 480-111-W60
City, State & Zip	30200 Mound Rd., Warren, MI, 48090
Phone and Fax #	Phone: 313-510-4328, Fax: 586-986-2281

4. Designated signatory authority of the facility: (Attach similar information for each authorized representative)

Name	William J. McFarland
Title	Director - Remediation Services
Address	Engineering West, Mail Code 480-111-W60
City, State & Zip	30200 Mound Rd., Warren, MI, 48090
Phone and Fax #	Phone: 313-506-9462, Fax: 586-986-2281, Cell:313-506-9462
E-mail	william.j.mcfarland@gm.com

5. Designated environmental facility contact: (if different from #4 above)

Name	Cheryl Hiatt
Title	Project Manager
City, State & Zip	30200 Mound Rd., Warren, MI, 48090
Phone and Fax	Phone: 313-510-4328, Fax: 586-986-2281, Cell:313-510-4328
E-mail	cheryl.r.hiatt@gm.com

SECTION B - BUSINESS ACTIVITY

1. If the facility employs or will be employing processes in any of the industrial categories or business activities listed below (regardless of whether they generate wastewater, waste sludge, or hazardous wastes), place a check beside the category of business activity
(Check all that apply).

EPA Industrial Categories

☐	Aluminum Forming
☐	Asbestos Manufacturing
☐	Battery Manufacturing
☐	Canned and Preserved Fruits and Vegetable Processing
☐	Canned and Preserved Seafood Processing
☐	Carbon Black Manufacturing
☐	Cement Manufacturing
☐	Centralized Waste Treatment

	Chemicals with Pesticides
	Coal Mining
	Coil Coating
	Copper Forming
	Dairy Products Processing
	Electrical and Electronic Components
	Electroplating
	Explosives Manufacturing
	Ferroalloy Manufacturing
	Fertilizer Manufacturing
	Foundries (Metal Molding and Casting)
	Glass Manufacturing
	Gum and Wood Chemicals Manufacturing
	Hospital
	Ink Formulating
	Inorganic Chemicals Manufacturing
	Iron and Steel Manufacturing
	Meat and Poultry Products
	Leather Tanning and Finishing
	Meat and Poultry Products
	Metal Finishing (electroplating, electrolyses plating, anodizing, coating, chemical Etching and milling, and printed circuit board manufacture)
	Metal Molding and Casting Formerly
	Metal Powders
	Metal Products and Machinery
	Nonferrous Metal Forming and Metal Powders
	Nonferrous Metal Manufacturing
	Organic Chemicals, Plastics, and Synthetic Fibers Manufacturing
	Paint Formulating
	Paving and Roofing Materials (Tars and Asphalt)
	Pesticide Chemicals
	Pharmaceutical Manufacturing
	Photographic
	Phosphate Manufacturing
	Plastic and Synthetic Materials Manufacturing
	Plastics Molding and Forming
	Porcelain Enameling
	Pulp, Paper, and Paperboard Manufacturing
	Rubber Manufacturing
	Soap and Detergent Manufacturing
	Steam Electric Power Generating
	Sugar Processing
	Timber Processing
	Transportation Equipment Cleaning
	Waste Combustors
X	Former Malleable Iron Plant (to be demolished)

2. Indicate applicable Standard Industrial Classification (SIC) or list the North American Industry Classification System (NAICS) for all processes (If more than one applies, list in descending order of importance.) A list of SIC and NAICS Codes can be found (World Wide Web address is on the first page of this permit).

No current SIC code. Former SIC code. 3322 (Malleable Iron Foundaries)

3. Give a brief description of all processes or operations at the facility including primary products or services (attach additional sheets as necessary):

The groundwater treatment system is a remedial system that recovers and treats impacted groundwater. Treated groundwater is discharged to the City sewer system via permitted outfalls CFD-01 and CFD-02. During operation, GM monitors monthly the groundwater treatment system influent, effluent, and between the carbon vessels. In addition, two compliance monitoring points (CFD-01 and CFD-02) are monitored in accordance with the current Industrial Wastewater Discharge Permit, Permit # 2004-10 (see Figure 1), which expires on August 26, 2009.

The plant is closed. Plant operations ceased on April 20, 2007, processes no longer exist, and the plant is scheduled for demolition.

4. PRODUCT VOLUME: (Attachments such as product lists are acceptable)

Product (Brand name)	Amounts Per Day (Daily Units) Past Calendar Year		Estimate This Year	
	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM
None	0	0	0	0
Plant is closed.				

SECTION C - WATER CONSUMPTION AND LOSS

List average water usage at the facility: no water use

Type	Average Water Usage (GPD)
Contact cooling water	
Non-contact cooling water	
Boiler, tower blow down	
Contained in product	
Process Wastewater	
Domestic (bathrooms, kitchen, household)	
Air pollution control unit	
Irrigation and lawn watering	
Facility & equipment wash down	
Other (Discharge from Groundwater Treatment)	
TOTAL	

SECTION D - SEWER and WASTEWATER DISCHARGE INFORMATION

1. In business since: The plant operated from 1917 to April 2007. Plant is closed. The groundwater treatment system has been operating since 1998.

2. Is the building presently connected to the public sanitary sewer system? (Yes/No) Yes

   If yes, what is the sanitary sewer account number? 40271-38710 and 40271-40204

   If no, have you applied for a sanitary sewer hookup? (Yes/No)

3. Does (or will) this facility discharge any wastewater other than domestic (bathrooms, kitchen, household) to the City (POTW)? (Yes/No) Yes

4. List size, descriptive location, and flow of each facility sewer, that connects to the City's sewer system (POTW). (Attach additional sheets as needed)

Sewer Size Inches	Descriptive Location of Sewer Connection and Discharge Point	Flow Avg/Max (GPD)
48	To City Sewer on W. Center St. (compliance point CFD-02) - see attached Figure 1.	850/1200
	Stormwater and infiltration	varies

5. Provide the following information on wastewater flow rates.
Hours/Day Wastewater is discharged:

	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Hours	24	24	24	24	24	24	24

Peak hourly flow rate	(GPD)	NA
Maximum daily flow rate	(GPD)	1200
Annual daily average	(GPD)	850

6. If batch discharge(s) occur or will occur, indicate the number of batch discharges per day

Average volume of batch discharge	NA	Gallons
Average flow rate	NA	Gallons/ Minutes
Percent of facilities total discharge	NA	%

7. List the average wastewater discharge**,** maximum discharge, and type of discharge (batch, continuous, or variable) for each plant process. Include the reference number from the process schematic that corresponds to each process.

No.	Process Description	Average Flow (Gallons per day)	Maximum Flow (Gallons per day)	Type of Discharge (Batch, continuous, variable)
1.	Groundwater Treatment System	850	1200	continous

8. Schematic Flow Diagram - For each activity in which wastewater is or will be generated,
   - Draw a diagram of unit processes from the start of the activity to its completion. Indicate which processes use water and which generate waste streams.
   - Include the average daily volume and maximum daily volume of each waste stream.
   - Apply the same numbers previously used in the above charts for each unit process having wastewater discharges to the City of Saginaw, POTW.
   - Indicate the present or future location of Automatic Sampling equipment or continuous flow metering equipment on the sewer schematic and describe the equipment below:

Figure 1 presents the location of the Groundwater Treatment System and the location of the monitoring points. Plan 1 presents a zoom in of the location of the Groundwater Treatment System and Plan 2 presents the Groundwater Treatment System process diagrams.

9. Sewer Layout – For the entire property, provide a sewer layout blueprint which includes all sanitary, storm and combined sewer sizes, connections, manholes and orientation. The drawing must be signed and certified by a State Registered Professional Engineer. Please refer to Figure 1 for the sewer layout.

10. Are any process changes or expansions planned during the next three years that could alter wastewater volumes or characteristics? (Consider production processes as well as air or water pollution treatment processes that may affect the discharge.)

(Yes/No)

Yes

If yes, describe these changes and their effects on the wastewater Volume and characteristics: (Attach additional sheets if necessary)

During demolition activities, additional water (for cleaning or dust control) may be temporarily directed to the sewer. At this time the volume and characteristics are unknown

11. Are any materials or remediation systems in use or planned?

(Yes/No)

Yes

If yes, describe the reclamation process, substance reclaimed, percent reclaimed, and the pollutant concentration in the spent solution. Submit a flow diagram for each process: (Attach additional sheets if Necessary)

The Groundwater Treatment System treats on average 850 GPD of groundwater, recovering approximately 1 GPD of oil. After oil/water separation, the water is treated by the addition of hydrogen peroxide followed by, filter bags, and a Granular Activated Carbon (GAC) system (2 vessels in series). The treated water is discharged to sanitary sewer. Any recovered oil and spent carbon are disposed off-site. The Groundwater Treatment System will continue to operate until insufficient oil can be recovered.

12. Are any of the following located on the property? (Check all that apply)

Yes	Abandoned Wells	Yes	Monitoring Wells
	Dry Wells	Yes	Storm Sewer

SECTION E – CHARACTERISTICS OF DISCHARGE

Analytical data reports shall be provided for all pollutants listed below and shall conform to 40 CRF Part 136. Samples must be representative of normal work cycles and expected pollutant discharges to the WWTP. Reports must also contain the sampling location, flow rate, time and date of sample collection.

Parameter	Units
Biochemical Oxygen Demand (BOD_5)	mg/L
Fats, Oils and Grease (FOG)	mg/L
Ammonia Nitrogen (NH_3N)	mg/L
Total Phosphorus	mg/L
pH	Standard Units
Temperature (T)	Degrees Fahrenheit
Total Suspended Solids (TSS)	mg/L
Amenable Cyanide (CN^{-})	mg/L

Arsenic (As)	mg/L
Cadmium (Cd)	mg/L
Chromium (Cr)	mg/L
Copper (Cu)	mg/L
Mercury (Hg)	mg/L
Nickel (Ni)	mg/L
Lead (Pb)	mg/L
Selenium (Se)	mg/L
Zinc (Zn)	mg/L
Benzene	mg/L
BTEX	mg/L
Total Toxic Organics (TTOs)	mg/L
Polychlorinated Biphenyls (PCBs)	ug/L

Please see attachment 1 for the analytical results from the last monthly sample collected from the effluent discharge from the Groundwater Treatment System, sampled in accordance with the previously held discharge permit.

SECTION F– WASTEWATER TREATMENT

1. Is any form of wastewater treatment practiced at this facility?

   If no, skip to section G

(Yes/No)
Yes

2. Treatment devices or processes used or proposed for treating wastewater or sludge (Check all that apply)

	Air flotation		Ion exchange
	Biological treatment, type		Mercury recovery system
	Carbon Adsorption		Neutralization, pH correction
	Centrifuge		Ozonation
	Chemical precipitation		Polymer addition
	Chlorination		Rainwater diversion or storage
	Cyclone		Reverse osmosis
	Filtration		Sedimentation
	Flow equalization		Septic tank
	Grease or oil separation, type		Silver Recovery Unit
	Grease trap		Solvent separation
	Grinding filter		Spill protection
	Grit removal		Sump
Yes	Ground Water Remediation System		Ultra filtration
			Other chemical/ physical treatment, type

3. Describe the pollutant loadings, flow rates, design capacity, physical size, and operating procedures of each treatment process checked above. (Attach additional sheets if necessary)

The Groundwater Treatment System treats on average 850 GPD of groundwater, recovering approximately 1 GPD of oil. After oil/water separation, the water is treated by the addition of hydrogen peroxide followed by, filter bags, and a Granular Activated Carbon (GAC) system (2 systems in series). The treated water is discharged to sanitary sewer. The recovered oil and spent carbon are disposed off-site. The system operates automatically with alarms. For additional information see attachment 2 for the O&M plan, which is also kept at the Site.

4. Is any form of wastewater treatment (or changes to a existing wastewater treatment) planned for this facility within the next three years?

(Yes/No)

Yes

If yes, describe treatment

Currently evaluating the potential to eliminate the current discharge outfall. A new outfall will likely be created thus replacing CFD-01 and CFD-02.

Attach a process flow diagram for each existing or planned treatment system. Include process equipment, by-products, by-product disposal method, by-product transfer method, waste and by-product volumes, and design and operating conditions.

See 5 below

5. Attach a process flow diagram for each existing or planned treatment system. Include process equipment, by-products, by-product disposal method, and by-product transfer method, waste and by-product volumes and design and operating conditions.

Please refer to Plan 1 and 2 for the Groundwater Treatment System location and process diagrams,

- Treated water is discharged to a City sanitary sewer.
- Oil is collected in 300 gallon totes and disposed of off-Site in accordance with applicable laws.
- Spent bag filters and GAC are disposed of off-Site in accordance with appropriate laws.

6. Describe any future changes in treatment or disposal methods planned or under construction for the wastewater discharge to the sanitary sewer. Please include the estimated completion date(s).

None planned

7. Do you have a wastewater treatment operator or a company responsible for the operation of the treatment system?

(Yes/No)

If yes, provide the following information, If no, skip to number 8

Yes

Name: Bart Bartholomy, Conestoga-Rovers & Associates

Title: Operator

Phone: 269-344-1230 ext. 236 Fax: 269-344-8558 * Cell: 269-207-3394

Full Time: _____ (Specify hours)

Part Time: once a week (Specify hours)

On-Site Inspector: Steve Hoevemeyer, Conestoga-Rovers & Associates

Contact (Cell): 616-437-7734

8. Is the operator certified?

(Yes/No)

Yes

9. Is there an Operations Manual kept on site for the Pretreatment Equipment?

The O&M manual is kept in the treatment building. (see attached)

(Yes/No)

Yes

10. Is there a maintenance schedule for the pretreatment system(s)?

During operation, routine maintenance is performed on weekly basis.

(Yes/No)

Yes

11. What preventative maintenance is performed on the pretreatment system(s)?

Yes, maintaining pumps per manufacturers recommendations

SECTION G – CHEMICAL INVENTORY AND SPILL PREVENTION

1. Does this facility use or store any pesticides or toxic pollutants? (See list provided)

(Yes/No)

No

2. List types and quantity of all chemicals used or planned for use. Include copies of manufacturer's Material Safety Data Sheets (MSDS) and any other related certificates of analyses for all chemicals identified. For petroleum products please list description and quantity only. (Information can be put on a CD or Disk)

Chemical	Quantity
Hydrogen Peroxide	see attachment 3 for the MSDS

3. Do you have chemical storage containers, bins, or ponds at your facility?

(Yes/No)

Yes

If yes, please give a description of their location, contents, size, type, frequency and the method of cleaning. Also, indicate in a diagram or comment on the proximity of these containers to a sewer or storm drain.

CONTENTS	STORAGE LOCATION	SIZE/TYPE	METHOD OF CLEANING
Hydrogen Peroxide	Groundwater Treatment System Building	300 Gallon Tote (2)	Not cleaned, new container purchased each time
Oil	Groundwater Treatment System Building	300 Gallon Tote (2)	Not cleaned, disposed of annually
GAC	Groundwater Treatment System Building	600 lbs Advanced Recovery Technologies Corp. Model Greenline 22 (2)	Changed out as required (approximately once every 3 years)

Plan 1 presents the layout of the Groundwater Treatment System.

4. Do you have floor drains in your manufacturing or chemical storage area(s)?

(Yes/No)

No

If yes, where do they discharge?

5. If you have chemical storage containers, bins, or ponds in the manufacturing area, could an accidental spill lead to a discharge to: (check all that apply)

	Sanitary sewer system (POTW)		Ground
	Storm drain		Other, specify

Plant is closed. Nothing used.

6. Do you have a Pollution Incident Prevention Plan (PIPP), Slug Plan, Spill Prevention or Spill Prevention Countermeasure & Control Plan (SPCC) to prevent spills of chemicals or slug discharges from entering the Control Authority's collection system?

(Yes/No)

Yes

If yes, (Please attach a copy of all that apply with the application)

7. Please describe below any previous spill events and remedial measures taken to prevent their reoccurrence.

On July 1, 2002, due to a malfunction of electrical connections, a newly installed pump did not turn off as designed when the rest of the system was shutdown, causing water to back up into the oil/water separator, the building containment area, and into a small swale west of the building. The water did not enter the plant sewer system or leave the property. MDEQ was notified on July 2, 2002. As a remedial measure, an air shut off valve was installed on the outlet of the air compressor receiver tank.

8. Categorical Industrial Users

Provide the following Total Toxic Organic (TTO) information.

a. Does (or will) this facility use any of the toxic organics that are listed under the TTO standard 40 CFR Part 433.2 and 413.3 of the applicable categorical pretreatment standards published by EPA?

(Yes/No)

No

b. Has a baseline monitoring report (BMR) that contains TTO been completed?

(Yes/No)

No

If yes, please attach a copy

c. Has a toxic organics management plan (TOMP) been developed?

(Yes/No)

No

If yes, please attach a copy

See attachment 1 for most recent monitoring results in accordance with existing SIU permit.

SECTION H - NON-DISCHARGED WASTES

1. Are any waste liquids or sludge's generated?

(Yes/No)

Yes

If yes, please describe below, If no, skip the remainder of Section I

Waste Generated	Quantity (per year)	Disposal Method
Recovered oil	375 Gallons	Off-Site Disposal Facility
Treated Groundwater	310250 Gallons	City Sanitary Sewer

2. State the name and address of all waste haulers:

Name To be determined
Address
Permit # (If applicable)

Name
Address
Permit # (If applicable)

Name
Address
Permit # (If applicable)

Name
Address
Permit # (If applicable)

SECTION I - ENVIRONMENTAL PERMITS

If any Federal, State, or local environmental permits have been issued to your facility please list them below?

- Significant Industrial User Discharge Permit # 2004-10, expires August 26, 2009 (being renewed under this application)

SECTION J - AUTHORIZED SIGNATURES

Compliance certification:

1. Are all applicable Federal, State, or local pretreatment standards and requirements being met on a consistent basis?

(Yes/No)

Yes

If no, answer the following questions:

a. What additional operations and maintenance procedures are being considered to bring the facility into compliance? Also, list additional treatment technology or practice being considered in order to bring the facility into compliance.

b. Provide a schedule for bringing the facility into compliance. Specify major events planned and reasonable completion dates. Note: if the Control Authority issues a permit to the applicant, it may establish a schedule for compliance different from the one submitted by the facility.

Milestone	**Completion Date**

In accordance with City of Saginaw Code of Ordinances Title V, Chapter 51§34 or the Northwest Utilities Authority Sewage Disposal Regulations No. 91-1, §1-114, information and data provided in this permit application which identifies the nature and frequency of discharge shall be available to the public without restriction. Requests for confidential treatment of other information shall be governed by procedures specified in Chapter 51§39 or 1-114. There is a $200.00 dollar administration fee for processing the permit application. Send the completed and signed application, and the $200.00 processing fee, within 90 days to:

City of Saginaw, Wastewater Treatment Facility
2406 Veterans Memorial Parkway
Saginaw, MI 48601-1268
Make check payable to: **Treasurer, City of Saginaw**
Include City account number: **590-0000-523-4730**.
Your cooperation is appreciated.

Authorized Representative Statement:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Date: 5-27-09
Name: William J. McFarland

Signature: William J McFarland

Title: Director - Remediation Services
Phone #: 313-506-9462
Fax #: 586-986-2281

City of Saginaw Discharge Permit Application Required Analytical Parameters

Ammonia Nitrogen
Biological Oxygen Demand (BOD-5 day)
Phosphorus
pH
Temperature
Total Suspended Solids
Oil and grease
Cyanide, total
Arsenic
Cadmium
Chromium
Copper
Mercury
Nickle
Lead
Selenium
Zinc

Priority Pollutants, Volatiles (VOC)

1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene
1,2-Dichlorobenzene
1,2-Dichloroethane
1,2-Dichloropropane
2-Chloroethylvinyl ether
Acrolein
Acrylonitrile
Benzene
Bromodichloromethane
Bromoform
Bromomethane
Carbon tetrachloride
Chlorobenzene
Chloroethane
Chloroform
Chloromethane
Cis-1,2-Dichloroethene
Cis-1,3-Dichloropropene
Dibromochloromethane
Ethylbenzene
Methylene chloride
Tetrachloroethene
Toluene

Trans-1,2-Dichloroethene
Trans-1,3-Dichloropropene
Trichloroethene
Trichlorofluoromethane
Vinyl chloride
Xylenes

Priority Pollutants, Semi-Volitile Base Neutral, Acids

2,4,6-Trichlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2,4-Dinitrophenol
2-Chlorophenol
2-Methyl-4,6-dinitrophenol
2-Nitrophenol
4-Chloro-3-methylphenol
4-Nitrophenol
Pentachlorophenol
Phenol
1,2,4-Trichlorobenzene
1,2-Dichlorobenzene
1,2-Diphenylhydrazine
1,3-Dichlorobenzene
1,4-Dichlorobenzene
2,3,7,8-TCDD
2,4-Dinitrotoluene
2,6-Dinitrotoluene
2-Chloronaphthalene
3,3'-Dichlorobenzidine
4-Bromophenyl phenyl ether
4-Chlorophenyl phenyl ether
Acenaphthene
Acenaphthylene
Anthracene
Benzidine
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(ghi)perylene
Benzo(k)fluoranthene
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl)ether
Bis(2-chloroisopropyl)ether
Bis(2-ethylhexyl)phthalate
Butylbenzyl phthalate
Chrysene
Di-N-butylphthalate
Di-n-Octyl phthalate

Dibenzo(ah)anthracene
Diethyl phthalate
Dimethyl phthalate
Fluoranthene
Fluorene
Heptachlor
Heptachlor epoxide
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Indeno(123cd)pyrene
Isophorone
N-Nitrosodi-n-propylamine
N-Nitrosodimethylamine
N-Nitrosodiphenylamine
Naphthalene
Nitrobenzene
Phenanthrene
Pyrene

Priority Pollutants, Pesticides

4,4'-DDD
4,4'-DDE
4,4'-DDT
Aldrin
Alpha-BHC
Beta-BHC
Chlordane
Delta-BHC
Dieldrin
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Gamma-BHC
Heptachlor
Heptachlor epoxide
Toxaphene

Priority Pollutants, PCBs by Method 608 Only

PCB Aroclor 1016
PCB Aroclor 1221
PCB Aroclor 1232
PCB Aroclor 1242
PCB Aroclor 1248
PCB Aroclor 1254
PCB Aroclor 1260

City of Saginaw Local Limits

Parameter	**Limit Daily Max**	**Units**
BOD_5	493	mg/L
CN^- Cyanide (amenable)	0.473	mg/L
***F**ats, **O**ils and **G**rease*	100	mg/L
NH_3N Ammonia Nitrogen	77	mg/L
P Phosphorus	7	mg/L
pH	6.0 to 10.5	S.U.
Temperature	120	Deg. F.
***T**otal **S**uspended **S**olids*	1100	mg/L
Metals		
As Arsenic	0.473	mg/L
Cd Cadmium (total)	0.110	mg/L
Cr Chromium (total)	2.770	mg/L
Cu Copper (total)	1.184	mg/L
Hg Mercury	• 0.0002	mg/L
Ni Nickel (total)	1.786	mg/L
Pb Lead (total)	0.377	mg/L
Se Selenium (total)	0.083	mg/L
Zn Zinc (total)	1.162	mg/L
Organics		
Benzene	0.5	mg/L
Total BTEX	5	mg/L
Total Polychlorinated Biphenyls PCBs	• 0.2	µg/L

- The quantification level shall not exceed 0.0002 mg/L unless a higher level is appropriate due to matrix interference. Any discharge of mercury at or above the quantification level is a specific violation.
- The quantification level shall be 0.2 µg/L unless a higher level is appropriate due to matrix interference. Any discharge of total PCBs at or above the quantification level is a specific violation.

Surcharge Limits

Parameter	Limit	Units	Surcharges
BOD_5	200	mg/L	$0.14 /lb
NH_3N Ammonia Nitrogen	30	mg/L	$0.41 /lb
P Phosphorus	4	mg/L	$1.02 /lb
TSS Total Suspended Solids	350	mg/L	$0.12 /lb

Plus a 10% charge of the amount of the charges not paid on or before the due date.

0 50 150ft

LEGEND

- GM SAGINAW MALLEABLE IRON PLANT PROPERTY LINE (APPROX.)
- REALM, INC. PROPERTY LINE (APPROX.)
- UNPAVED ROAD
- GROUND SURFACE ELEVATION CONTOUR (10 FT INTERVAL)
- FENCE LINE
- SWAMPY AREA
- CITY SEWER LINE
- MAIN SEWERS TO CITY - SANITARY, STORM AND PROCESS
- MAIN SEWERS TO SETTLING BASIN OR STORM POND - STORM AND PROCESS
- BRANCH SEWERS TO SETTLING BASIN OR STORM POND - STORM AND PROCESS
- BRANCH SEWERS TO CITY - SANITARY, STORM AND PROCESS
- BRANCH SEWERS TO CITY - SANITARY
- AUXILIARY WASTE SEWER
- ABANDONED SEWER LINES
- OVERHEAD SEWER LINE
- COLUMN IDENTIFIER
- MH MANHOLE
- CB CATCHBASIN
- RD ROOF DRAIN
- FLOOR PENETRATION
- ROOF HOPPER
- ROOF HOPPER AND FLOOR PENETRATION
- DOWNSPOUT
- CIPP CURE IN PLACE PIPE

NOTE: THIS DRAWING HAS BEEN PREPARED UTILIZING ALL AVAILABLE INFORMATION, HOWEVER UTILITY LOCATIONS SHOULD BE FIELD VERIFIED BEFORE COMPLETING ANY INTRUSIVE ACTIVITIES.

SALT STREET
CENTER STREET
SMI COMPLIANCE POINT (CFD-02)
SMI COMPLIANCE POINT (CFD-01)
MELTING DEPARTMENT AREA
APPROXIMATE LOCATION OF CONSUMERS ENERGY COMPANY EASEMENT
GM SAGINAW MALLEABLE IRON PLANT
TERMINATED TYPE III LANDFILL
QUENCH PIT AREA
FORMER UST #7 AREA
CONCRETE PAD (FORMER DELPHI SAGINAW STEERING SYSTEMS PLANT 2)
LNAPL ASSESSMENT AND REMEDIATION AREA
BUFFER BASIN
STORWATER POND

No	Revision	Date	Initial

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

IAN KERR RICHARDSON — STATE OF MICHIGAN — REGISTERED PROFESSIONAL ENGINEER — No. 45338 — 5/28/09

GENERAL MOTORS POWERTRAIN SMI
SAGINAW, MIGHIGAN

EXISTING SEWER LAYOUT AND COMPLIANCE MONITORING LOCATIONS

CONESTOGA-ROVERS & ASSOCIATES

Source References:

Project Manager:	Reviewed By:	Date:	
M.T.	J.P.	MAY 2009	
Scale: 1"=150'	Project No.: 07878-06	Report No.: PRES013	Drawing No.: figure 1

07878-06(PRES013)GN-WA001 MAY 28/2009

ATTACHMENT 1

DISCHARGE ANALYTICAL RESULTS

Analytical Laboratory Report

Report ID: S40429.01(01)
Generated on 04/23/2009

Report to

Attention: Steve Hoevemeyer/Cheryl Hyatt
GM SMI
77 W. Center
MC: 486-577-008
Saginaw, Michigan 48605

Phone: 989-757-0920 FAX: 989-757-0707
Email: shoevemeyer@craworld.com

Report produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S40429.01-S40429.02
Project: 02 & 01 Qtly - SMI SSOW# 7878-002
Collected Date: 04/14/2009
Submitted Date/Time: 04/14/2009 13:40
Sampled by: Terry Gooslin
P.O. #: 4017090

Report Notes

Results relate only to items tested as received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
"Not detected" indicates that parameter was not found at a level equal to or greater than the RL.

Violetta F. Murshak
Laboratory Director

Analytical Laboratory Report

Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S40429.01	01	Liquid	04/14/2009 11:00
S40429.02	02	Liquid	04/14/2009 11:15

Analytical Laboratory Report

Lab Sample ID: S40429.01
Sample Tag: 01
Collected Date/Time: 04/14/2009 11:00
Matrix: Liquid
COC Reference: 49471

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Amber	None	Yes	4.0	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	Limits	Flags
Extraction / Prep.								
Extraction, PCB	Completed			3510C	04/14/09 15:00	TAS		
Organics - PCBs/Pesticides								
PCB								
PCB-1016	Not detected	ug/L	0.1	608	04/15/09 18:07	JANB		
PCB-1221	Not detected	ug/L	0.1	608	04/15/09 18:07	JANB		
PCB-1232	Not detected	ug/L	0.1	608	04/15/09 18:07	JANB		
PCB-1242	Not detected	ug/L	0.1	608	04/15/09 18:07	JANB		
PCB-1248	Not detected	ug/L	0.1	608	04/15/09 18:07	JANB		
PCB-1254	Not detected	ug/L	0.1	608	04/15/09 18:07	JANB		
PCB-1260	Not detected	ug/L	0.1	608	04/15/09 18:07	JANB		
PCB, Total	Not detected	ug/L	0.1	608	04/15/09 18:07	JANB		

Analytical Laboratory Report

Lab Sample ID: S40429.02
Sample Tag: 02
Collected Date/Time: 04/14/2009 11:15
Matrix: Liquid
COC Reference: 49471

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	1L Amber	None	Yes	4.0	IR
2	40ml Glass	HCL	Yes	4.0	IR
1	32oz Glass	HCL	Yes	4.0	IR
1	125ml Plastic	HNO3	Yes	4.0	IR
2	250ml Plastic	H2SO4	Yes	4.0	IR
1	125ml Plastic	NaOH	Yes	4.0	IR
1	1L Plastic	None	Yes	4.0	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	Limits	Flags
Extraction / Prep.								
BNA Extraction	Completed			3510C	04/15/09 20:22	EMR		
Extraction, PCB	Completed			3510C	04/14/09 15:00	TAS		
Mercury Digestion	Completed			7470A	04/15/09 11:30	JRT		
Metal Digestion	Completed			3015A	04/15/09 12:00	SLS		
Inorganics								
Amenable Cyanide	Not detected	mg/L	0.005	335.4/4500-CN-E	04/17/09 10:54	JDP	0.473	
Ammonia-N	1.38	mg/L	0.04	4500-NH3 D	04/15/09 15:00	MJC	30	
COD	41	mg/L	1	410.4	04/16/09 16:00	MJC		
Field pH	7.45	STD Units	0.01	4500-H+ B	04/14/09 11:15	TG	6.0-10.5	
Field Temperature	59	oF	1	2550 B	04/14/09 11:15	TG		
Flow, Field	10,300	gpd			04/14/09 11:15	TG	580,000	
Oil & Grease	1	mg/L	1	413.1	04/17/09 16:19	TAS	100	
Phenols	Not detected	mg/L	0.01	420.1	04/20/09 14:50	JKB		
TBOD5	7	mg/L	1	5210B	04/16/09 11:39-04/21/09	DJS	150	
Total Dissolved Solids	864	mg/L	1	2540C	04/21/09 15:17	WAR		
Total Phosphorus	0.17	mg/L	0.01	4500-PE	04/20/09 16:00	MJC	3	
Total Suspended Solids	4	mg/L	1	2540 D	04/21/09 14:55	WAR	350	
Metals								
Arsenic	0.002	mg/L	0.001	200.8	04/15/09 13:38	SLS	0.473	
Cadmium	Not detected	mg/L	0.0005	200.8	04/15/09 13:38	SLS	0.11	
Chromium	0.001	mg/L	0.005	200.8	04/15/09 13:38	SLS	2.77	b
Copper	Not detected	mg/L	0.001	200.8	04/15/09 13:38	SLS	1.184	
Lead	0.001	mg/L	0.003	200.8	04/15/09 13:38	SLS	0.377	b
Mercury	Not detected	mg/L	0.0002	245.1	04/16/09 14:29	JRT	0.0002	
Molybdenum	0.010	mg/L	0.005	200.8	04/15/09 13:38	SLS		
Nickel	0.001	mg/L	0.005	200.8	04/15/09 13:38	SLS	1.786	b
Selenium	0.001	mg/L	0.005	200.8	04/15/09 13:38	SLS	0.083	b
Silver	0.0008	mg/L	0.0005	200.8	04/15/09 13:38	SLS		
Zinc	0.017	mg/L	0.005	200.8	04/15/09 13:38	SLS	1.162	
Organics - PCBs/Pesticides								
PCB								
PCB-1016	Not detected	ug/L	0.1	608	04/15/09 18:18	JANB		
PCB-1221	Not detected	ug/L	0.1	608	04/15/09 18:18	JANB		

b-Value detected less than reporting limit, but greater than MDL

Lab Sample ID: S40429.02 (continued)
Sample Tag: 02

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	Limits	Flags
Organics - PCBs/Pesticides (continued)								
PCB (continued)								
PCB-1232	Not detected	ug/L	0.1	608	04/15/09 18:18	JANB		
PCB-1242	Not detected	ug/L	0.1	608	04/15/09 18:18	JANB		
PCB-1248	Not detected	ug/L	0.1	608	04/15/09 18:18	JANB		
PCB-1254	Not detected	ug/L	0.1	608	04/15/09 18:18	JANB		
PCB-1260	Not detected	ug/L	0.1	608	04/15/09 18:18	JANB		
PCB, Total	Not detected	ug/L	0.1	608	04/15/09 18:18	JANB	0.2	
Organics - Semi-Volatiles								
Semi-Volatile Organics GM-SMI 02 TTO								
Acenaphthene	Not detected	ug/L	10	625	04/16/09 14:35	ARH		
Acenaphthylene	Not detected	ug/L	10	625	04/16/09 14:35	ARH		
Anthracene	Not detected	ug/L	10	625	04/16/09 14:35	ARH		
Benzo(a)anthracene	Not detected	ug/L	10	625	04/16/09 14:35	ARH		
bis(2-Ethylhexyl)phthalate	2	ug/L	10	625	04/16/09 14:35	ARH		BJ
Butyl benzyl phthalate	Not detected	ug/L	10	625	04/16/09 14:35	ARH		
Chrysene	Not detected	ug/L	10	625	04/16/09 14:35	ARH		
di-n-Butyl phthalate	Not detected	ug/L	10	625	04/16/09 14:35	ARH		
2,4-Dichlorophenol	Not detected	ug/L	10	625	04/16/09 14:35	ARH		
Diethyl phthalate	Not detected	ug/L	10	625	04/16/09 14:35	ARH		
Dimethyl phthalate	Not detected	ug/L	10	625	04/16/09 14:35	ARH		
2,4-Dimethylphenol	Not detected	ug/L	10	625	04/16/09 14:35	ARH		
Fluoranthene	Not detected	ug/L	10	625	04/16/09 14:35	ARH		
Fluorene	Not detected	ug/L	10	625	04/16/09 14:35	ARH		
Naphthalene	Not detected	ug/L	10	625	04/16/09 14:35	ARH		
Pentachlorophenol	Not detected	ug/L	10	625	04/16/09 14:35	ARH		
Phenol	2	ug/L	10	625	04/16/09 14:35	ARH		J
Pyrene	Not detected	ug/L	10	625	04/16/09 14:35	ARH		
Phenanthrene	Not detected	ug/L	10	625	04/16/09 14:35	ARH		
Organics - Volatiles								
Total BTEX	Not detected	ug/L	5	624	04/15/09 16:34	JGH		
Volatile Organics-GM-SMI 02 VOC TTO List								
Methylene chloride	Not detected	ug/L	5	624	04/15/09 16:34	JGH		
Chloroform	Not detected	ug/L	1	624	04/15/09 16:34	JGH		
Benzene	Not detected	ug/L	1	624	04/15/09 16:34	JGH	500	
Toluene	Not detected	ug/L	1	624	04/15/09 16:34	JGH	1,000	
Ethylbenzene	Not detected	ug/L	1	624	04/15/09 16:34	JGH	1,000	
o-Xylene	Not detected	ug/L	1	624	04/15/09 16:34	JGH	1,000	
p,m-Xylene	Not detected	ug/L	1	624	04/15/09 16:34	JGH	1,000	

B-Compound also found in associated method blank J-Estimated value less than reporting limit, but greater than MDL

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-6333
www.meritlabs.com

C.O.C. PAGE # ____ OF ____

49471

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Steve Hoeweyer - Cheryl Hyatt
COMPANY: CRA - SMI
ADDRESS: 77 W. Center
CITY: Saginaw STATE: MI ZIP CODE:
PHONE NO.: FAX NO.: P.O. NO.:
E MAIL ADDRESS: QUOTE NO.:

INVOICE TO

CONTACT NAME: SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: FAX NO.: P.O. NO.:

PROJECT NO./NAME: 02-01 Alby-SA
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Gaslin, Shane

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED: ☐ STANDARD ☐ LEVEL II ☐ LEVEL III ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE O=OIL A=AIR W=WASTE M=MISC

ANALYSIS (ATTACH LIST IF MORE SPACE REQUIRED)

SA + Alby Parameters

MERIT LAB NO.	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCL	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	SPECIAL INSTRUCTIONS/NOTES
40429.01	4/14/09	11 00	01	L	2	X							X
.02	"	11 15	02	L	11	X	X	X	X	X			X X X X X

Please E-mail Report's to CHEM DET at world dot com

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	4/14/09	1210
RELINQUISHED BY: SIGNATURE/ORGANIZATION		
RECEIVED BY: SIGNATURE/ORGANIZATION		

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	4/14/09	1340

SEAL NO	SEAL INTACT YES ☐ NO ☐	INITIALS
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS

NOTES: TEMP. ON ARRIVAL 4.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ACCEPTANCE OF TERMS & CONDITIONS ON REVERSE SIDE

Analytical Laboratory Report

Report ID: S40445.01(01)
Generated on 04/23/2009

Report to

Attention: Steve Hoevemeyer/Cheryl Hyatt
GM SMI
77 W. Center
MC: 486-577-008
Saginaw, Michigan 48605

Phone: 989-757-0920 FAX: 989-757-0707
Email: shoevemeyer@craworld.com

Report produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S40445.01-S40445.02
Project: 02 & 01 Qtly - SMI SSOW# 7878-002
Collected Date: 04/15/2009
Submitted Date/Time: 04/15/2009 14:45
Sampled by: Terry Gooslin
P.O. #: 4017090

Report Notes

Results relate only to items tested as received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
"Not detected" indicates that parameter was not found at a level equal to or greater than the RL.

Violetta F. Murshak
Laboratory Director

Analytical Laboratory Report

Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S40445.01	01	Liquid	04/15/2009 11:00
S40445.02	02	Liquid	04/15/2009 11:15

Analytical Laboratory Report

Lab Sample ID: S40445.01
Sample Tag: 01
Collected Date/Time: 04/15/2009 11:00
Matrix: Liquid
COC Reference: 49472

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Amber	None	Yes	4.1	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	Limits	Flags
Extraction / Prep.								
Extraction, PCB	Completed			3510C	04/16/09 09:58	TAS		
Organics - PCBs/Pesticides								
PCB								
PCB-1016	Not detected	ug/L	0.1	608	04/16/09 13:31	JANB		
PCB-1221	Not detected	ug/L	0.1	608	04/16/09 13:31	JANB		
PCB-1232	Not detected	ug/L	0.1	608	04/16/09 13:31	JANB		
PCB-1242	Not detected	ug/L	0.1	608	04/16/09 13:31	JANB		
PCB-1248	Not detected	ug/L	0.1	608	04/16/09 13:31	JANB		
PCB-1254	Not detected	ug/L	0.1	608	04/16/09 13:31	JANB		
PCB-1260	Not detected	ug/L	0.1	608	04/16/09 13:31	JANB		
PCB, Total	Not detected	ug/L	0.1	608	04/16/09 13:31	JANB		

Analytical Laboratory Report

Lab Sample ID: S40445.02
Sample Tag: 02
Collected Date/Time: 04/15/2009 11:15
Matrix: Liquid
COC Reference: 49472

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	1L Amber	None	Yes	4.1	IR
2	40ml Glass	HCL	Yes	4.1	IR
1	125ml Plastic	HNO3	Yes	4.1	IR
1	32oz Glass	HCL	Yes	4.1	IR
1	250ml Plastic	H2SO4	Yes	4.1	IR
1	125ml Plastic	NaOH	Yes	4.1	IR
1	1L Plastic	None	Yes	4.1	IR
1	125ml Amber	H2SO4	Yes	4.1	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	Limits	Flags
Extraction / Prep.								
BNA Extraction	Completed			3510C	04/15/09 20:22	EMR		
Extraction, PCB	Completed			3510C	04/16/09 09:58	TAS		
Mercury Digestion	Completed			7470A	04/17/09 10:00	JRT		
Metal Digestion	Completed			3015A	04/16/09 12:00	SLS		
Inorganics								
Amenable Cyanide	Not detected	mg/L	0.005	335.4/4500-CN-E	04/23/09 11:08	JDP	0.473	
Ammonia-N	1.44	mg/L	0.02	4500-NH3 D	04/22/09 12:00	MJC	30	
COD	42	mg/L	1	410.4	04/16/09 16:00	MJC		
Field pH	7.93	STD Units	0.01	4500-H+ B	04/15/09 11:15	TG	6.0-10.5	
Field Temperature	58	oF	1	2550 B	04/15/09 11:15	TG		
Flow, Field	14,000	gpd			04/15/09 11:15	TG	580,000	
Oil & Grease	1	mg/L	1	413.1	04/17/09 16:19	TAS	100	
Phenols	Not detected	mg/L	0.01	420.1	04/20/09 14:55	JKB		
TBOD5	9	mg/L	1	5210B	04/17/09 10:00-04/22/09	DJS	150	
Total Dissolved Solids	856	mg/L	1	2540C	04/21/09 15:17	WAR		
Total Phosphorus	0.15	mg/L	0.01	4500-PE	04/23/09 15:00	MJC	3	
Total Suspended Solids	4	mg/L	1	2540 D	04/21/09 14:55	WAR	350	
Metals								
Arsenic	0.001	mg/L	0.001	200.8	04/16/09 13:16	SLS	0.473	
Cadmium	0.0001	mg/L	0.0005	200.8	04/16/09 13:16	SLS	0.11	b
Chromium	Not detected	mg/L	0.005	200.8	04/16/09 13:16	SLS	2.77	
Copper	0.001	mg/L	0.001	200.8	04/16/09 13:16	SLS	1.184	
Lead	0.007	mg/L	0.003	200.8	04/16/09 13:16	SLS	0.377	
Mercury	Not detected	mg/L	0.0002	245.1	04/17/09 13:29	JRT	0.0002	
Molybdenum	0.008	mg/L	0.005	200.8	04/16/09 13:16	SLS		
Nickel	0.001	mg/L	0.005	200.8	04/16/09 13:16	SLS	1.786	b
Selenium	0.001	mg/L	0.005	200.8	04/16/09 13:16	SLS	0.083	b
Silver	Not detected	mg/L	0.0005	200.8	04/16/09 13:16	SLS		
Zinc	0.092	mg/L	0.005	200.8	04/16/09 13:16	SLS	1.162	
Organics - PCBs/Pesticides								
PCB								
PCB-1016	Not detected	ug/L	0.1	608	04/16/09 13:43	JANB		

b-Value detected less than reporting limit, but greater than MDL

Lab Sample ID: S40445.02 (continued)
Sample Tag: 02

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	Limits	Flags
Organics - PCBs/Pesticides (continued)								
PCB (continued)								
PCB-1221	Not detected	ug/L	0.1	608	04/16/09 13:43	JANB		
PCB-1232	Not detected	ug/L	0.1	608	04/16/09 13:43	JANB		
PCB-1242	Not detected	ug/L	0.1	608	04/16/09 13:43	JANB		
PCB-1248	Not detected	ug/L	0.1	608	04/16/09 13:43	JANB		
PCB-1254	Not detected	ug/L	0.1	608	04/16/09 13:43	JANB		
PCB-1260	Not detected	ug/L	0.1	608	04/16/09 13:43	JANB		
PCB, Total	Not detected	ug/L	0.1	608	04/16/09 13:43	JANB	0.2	
Organics - Semi-Volatiles								
Semi-Volatile Organics GM-SMI 02 TTO								
Acenaphthene	Not detected	ug/L	10	625	04/16/09 15:09	ARH		
Acenaphthylene	Not detected	ug/L	10	625	04/16/09 15:09	ARH		
Anthracene	Not detected	ug/L	10	625	04/16/09 15:09	ARH		
Benzo(a)anthracene	Not detected	ug/L	10	625	04/16/09 15:09	ARH		
bis(2-Ethylhexyl)phthalate	2	ug/L	10	625	04/16/09 15:09	ARH		BJ
Butyl benzyl phthalate	Not detected	ug/L	10	625	04/16/09 15:09	ARH		
Chrysene	Not detected	ug/L	10	625	04/16/09 15:09	ARH		
di-n-Butyl phthalate	Not detected	ug/L	10	625	04/16/09 15:09	ARH		
2,4-Dichlorophenol	Not detected	ug/L	10	625	04/16/09 15:09	ARH		
Diethyl phthalate	Not detected	ug/L	10	625	04/16/09 15:09	ARH		
Dimethyl phthalate	Not detected	ug/L	10	625	04/16/09 15:09	ARH		
2,4-Dimethylphenol	Not detected	ug/L	10	625	04/16/09 15:09	ARH		
Fluoranthene	Not detected	ug/L	10	625	04/16/09 15:09	ARH		
Fluorene	Not detected	ug/L	10	625	04/16/09 15:09	ARH		
Naphthalene	Not detected	ug/L	10	625	04/16/09 15:09	ARH		
Pentachlorophenol	Not detected	ug/L	10	625	04/16/09 15:09	ARH		
Phenol	1	ug/L	10	625	04/16/09 15:09	ARH		J
Pyrene	Not detected	ug/L	10	625	04/16/09 15:09	ARH		
Phenanthrene	Not detected	ug/L	10	625	04/16/09 15:09	ARH		
Organics - Volatiles								
Total BTEX	Not detected	ug/L	5	624	04/16/09 18:50	JGH		
Volatile Organics-GM-SMI 02 VOC TTO List								
Methylene chloride	Not detected	ug/L	5	624	04/16/09 18:50	JGH		
Chloroform	Not detected	ug/L	1	624	04/16/09 18:50	JGH		
Benzene	Not detected	ug/L	1	624	04/16/09 18:50	JGH	500	
Toluene	Not detected	ug/L	1	624	04/16/09 18:50	JGH	1,000	
Ethylbenzene	Not detected	ug/L	1	624	04/16/09 18:50	JGH	1,000	
o-Xylene	Not detected	ug/L	1	624	04/16/09 18:50	JGH	1,000	
p,m-Xylene	Not detected	ug/L	1	624	04/16/09 18:50	JGH	1,000	

B-Compound also found in associated method blank J-Estimated value less than reporting limit, but greater than MDL

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-6333
www.meritlabs.com

C.O.C. PAGE # ___ OF ___

49472

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Steve Hoevemeyer - Cheryl Hyatt
COMPANY: CRA - SMI
ADDRESS: 77 W. Center
CITY: Saginaw STATE: MI ZIP CODE:
PHONE NO.: FAX NO: P.O. NO:
E-MAIL ADDRESS: QUOTE NO.:

INVOICE TO

CONTACT NAME: SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: FAX NO: P.O. NO:

PROJECT NO./NAME: 02-01 Otty - SA
SAMPLER(S) - PLEASE PRINT/SIGN NAME: T Goslin,

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED: ☐ STANDARD ☐ LEVEL II ☐ LEVEL III ☐ OTHER

ANALYSIS (ATTACH LIST IF MORE SPACE REQUIRED): SA ; Otty 04 / 24 / 13

SPECIAL INSTRUCTIONS/NOTES:

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE O=OIL A=AIR W=WASTE M=MISC

MERIT LAB NO.	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCL	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	
40445.01	4-15-09	11 AM	01	L	2	X							Y
02		11:15	02	L	11	X	X	X	X				

RELINQUISHED BY: SIGNATURE/ORGANIZATION: [signature] DATE: 4-15-09 TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: [signature] DATE: 4/15/09 TIME: 1230

RELINQUISHED BY: SIGNATURE/ORGANIZATION: [signature] DATE: 4/15/09 TIME: 1445
RECEIVED BY: SIGNATURE/ORGANIZATION: Barbara Rhodes DATE: 4-15-09 TIME: 14:45

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

SEAL NO.: SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO.: SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES: TEMP ON ARRIVAL 4.1

PLEASE NOTE: SIGNING ACKNOWLEDGES ACCEPTANCE OF TERMS & CONDITIONS ON REVERSE SIDE

Analytical Laboratory Report

Report ID: S40461.01(01)
Generated on 04/24/2009

Report to

Attention: Steve Hoevemeyer/Cheryl Hyatt
GM SMI
77 W. Center
MC: 486-577-008
Saginaw, Michigan 48605

Phone: 989-757-0920 FAX: 989-757-0707
Email: shoevemeyer@craworld.com

Report produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S40461.01-S40461.02
Project: 02 & 01 Qtly - SMI SSOW# 7878-002
Collected Date: 04/16/2009
Submitted Date/Time: 04/16/2009 15:30
Sampled by: Terry Gooslin
P.O. #: 4017090

Report Notes

Results relate only to items tested as received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
"Not detected" indicates that parameter was not found at a level equal to or greater than the RL.

Violetta F. Murshak
Laboratory Director

Analytical Laboratory Report

Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S40461.01	01	Liquid	04/16/2009 11:00
S40461.02	02	Liquid	04/16/2009 11:15

Analytical Laboratory Report

Lab Sample ID: S40461.01
Sample Tag: 01
Collected Date/Time: 04/16/2009 11:00
Matrix: Liquid
COC Reference: 49474

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Amber	None	Yes	4.1	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	Limits	Flags
Extraction / Prep.								
Extraction, PCB	Completed			3510C	04/20/09 11:05	DJS		
Organics - PCBs/Pesticides								
PCB								
PCB-1016	Not detected	ug/L	0.1	608	04/20/09 13:41	JANB		
PCB-1221	Not detected	ug/L	0.1	608	04/20/09 13:41	JANB		
PCB-1232	Not detected	ug/L	0.1	608	04/20/09 13:41	JANB		
PCB-1242	Not detected	ug/L	0.1	608	04/20/09 13:41	JANB		
PCB-1248	Not detected	ug/L	0.1	608	04/20/09 13:41	JANB		
PCB-1254	Not detected	ug/L	0.1	608	04/20/09 13:41	JANB		
PCB-1260	Not detected	ug/L	0.1	608	04/20/09 13:41	JANB		
PCB, Total	Not detected	ug/L	0.1	608	04/20/09 13:41	JANB		

Analytical Laboratory Report

Lab Sample ID: S40461.02
Sample Tag: 02
Collected Date/Time: 04/16/2009 11:15
Matrix: Liquid
COC Reference: 49474

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	1L Amber	None	Yes	4.1	IR
2	40ml Glass	HCL	Yes	4.1	IR
1	32oz Glass	HCL	Yes	4.1	IR
1	1L Plastic	None	Yes	4.1	IR
1	125ml Plastic	HNO3	Yes	4.1	IR
1	125ml Plastic	NaOH	Yes	4.1	IR
1	250ml Plastic	H2SO4	Yes	4.1	IR
1	125ml Amber	H2SO4	Yes	4.1	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	Limits	Flags
Extraction / Prep.								
BNA Extraction	Completed			3510C	04/17/09 19:32	EMR		
Extraction, PCB	Completed			3510C	04/20/09 11:05	DJS		
Mercury Digestion	Completed			7470A	04/22/09 09:30	JRT		
Metal Digestion	Completed			3015A	04/17/09 12:00	SLS		
Inorganics								
Amenable Cyanide	Not detected	mg/L	0.005	335.4/4500-CN-E	04/23/09 11:16	JDP	0.473	
Ammonia-N	1.24	mg/L	0.02	4500-NH3 D	04/22/09 12:00	MJC	30	
COD	28	mg/L	1	410.4	04/24/09 13:00	MJC		
Field pH	7.33	STD Units	0.01	4500-H+ B	04/16/09 11:15	TG	6.0-10.5	
Field Temperature	56	oF	1	2550 B	04/16/09 11:15	TG		
Flow, Field	5,500	gpd			04/16/09 11:15	TG	580,000	
Oil & Grease	1	mg/L	1	413.1	04/17/09 16:19	TAS	100	
Phenols	Not detected	mg/L	0.01	420.1	04/20/09 15:00	JKB		
TBOD5	8	mg/L	1	5210B	04/17/09 10:00-04/22/09	DJS	150	
Total Dissolved Solids	776	mg/L	1	2540C	04/21/09 15:17	WAR		
Total Phosphorus	0.15	mg/L	0.01	4500-PE	04/23/09 18:00	MJC	3	
Total Suspended Solids	8	mg/L	1	2540 D	04/21/09 14:55	WAR	350	
Metals								
Arsenic	0.001	mg/L	0.001	200.8	04/17/09 12:47	SLS	0.473	
Cadmium	0.0004	mg/L	0.0005	200.8	04/17/09 12:47	SLS	0.11	b
Chromium	Not detected	mg/L	0.005	200.8	04/17/09 12:47	SLS	2.77	
Copper	0.001	mg/L	0.001	200.8	04/17/09 12:47	SLS	1.184	
Lead	0.004	mg/L	0.003	200.8	04/17/09 12:47	SLS	0.377	
Mercury	Not detected	mg/L	0.0002	245.1	04/22/09 16:12	JRT	0.0002	
Molybdenum	0.008	mg/L	0.005	200.8	04/17/09 12:47	SLS		
Nickel	0.001	mg/L	0.005	200.8	04/17/09 12:47	SLS	1.786	b
Selenium	Not detected	mg/L	0.005	200.8	04/17/09 12:47	SLS	0.083	
Silver	Not detected	mg/L	0.0005	200.8	04/17/09 12:47	SLS		
Zinc	0.078	mg/L	0.005	200.8	04/17/09 12:47	SLS	1.162	
Organics - PCBs/Pesticides								
PCB								
PCB-1016	Not detected	ug/L	0.1	608	04/20/09 13:52	JANB		

b-Value detected less than reporting limit, but greater than MDL

Lab Sample ID: S40461.02 (continued)
Sample Tag: 02

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	Limits	Flags
Organics - PCBs/Pesticides (continued)								
PCB (continued)								
PCB-1221	Not detected	ug/L	0.1	608	04/20/09 13:52	JANB		
PCB-1232	Not detected	ug/L	0.1	608	04/20/09 13:52	JANB		
PCB-1242	Not detected	ug/L	0.1	608	04/20/09 13:52	JANB		
PCB-1248	Not detected	ug/L	0.1	608	04/20/09 13:52	JANB		
PCB-1254	Not detected	ug/L	0.1	608	04/20/09 13:52	JANB		
PCB-1260	Not detected	ug/L	0.1	608	04/20/09 13:52	JANB		
PCB, Total	Not detected	ug/L	0.1	608	04/20/09 13:52	JANB	0.2	
Organics - Semi-Volatiles								
Semi-Volatile Organics GM-SMI 02 TTO								
Acenaphthene	Not detected	ug/L	10	625	04/20/09 13:56	ARH		
Acenaphthylene	Not detected	ug/L	10	625	04/20/09 13:56	ARH		
Anthracene	Not detected	ug/L	10	625	04/20/09 13:56	ARH		
Benzo(a)anthracene	Not detected	ug/L	10	625	04/20/09 13:56	ARH		
bis(2-Ethylhexyl)phthalate	2	ug/L	10	625	04/20/09 13:56	ARH		BJ
Butyl benzyl phthalate	Not detected	ug/L	10	625	04/20/09 13:56	ARH		
Chrysene	Not detected	ug/L	10	625	04/20/09 13:56	ARH		
di-n-Butyl phthalate	Not detected	ug/L	10	625	04/20/09 13:56	ARH		
2,4-Dichlorophenol	Not detected	ug/L	10	625	04/20/09 13:56	ARH		
Diethyl phthalate	Not detected	ug/L	10	625	04/20/09 13:56	ARH		
Dimethyl phthalate	Not detected	ug/L	10	625	04/20/09 13:56	ARH		
2,4-Dimethylphenol	Not detected	ug/L	10	625	04/20/09 13:56	ARH		
Fluoranthene	Not detected	ug/L	10	625	04/20/09 13:56	ARH		
Fluorene	Not detected	ug/L	10	625	04/20/09 13:56	ARH		
Naphthalene	Not detected	ug/L	10	625	04/20/09 13:56	ARH		
Pentachlorophenol	Not detected	ug/L	10	625	04/20/09 13:56	ARH		
Phenol	Not detected	ug/L	10	625	04/20/09 13:56	ARH		
Pyrene	Not detected	ug/L	10	625	04/20/09 13:56	ARH		
Phenanthrene	Not detected	ug/L	10	625	04/20/09 13:56	ARH		
Organics - Volatiles								
Total BTEX	Not detected	ug/L	5	624	04/16/09 19:42	JGH		
Volatile Organics-GM-SMI 02 VOC TTO List								
Methylene chloride	Not detected	ug/L	5	624	04/16/09 19:42	JGH		
Chloroform	0.1	ug/L	1	624	04/16/09 19:42	JGH		J
Benzene	Not detected	ug/L	1	624	04/16/09 19:42	JGH	500	
Toluene	0.1	ug/L	1	624	04/16/09 19:42	JGH	1,000	J
Ethylbenzene	Not detected	ug/L	1	624	04/16/09 19:42	JGH	1,000	
o-Xylene	Not detected	ug/L	1	624	04/16/09 19:42	JGH	1,000	
p,m-Xylene	Not detected	ug/L	1	624	04/16/09 19:42	JGH	1,000	

B-Compound also found in associated method blank J-Estimated value less than reporting limit, but greater than MDL

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-6333
www.meritlabs.com

C.O.C. PAGE # __ __ OF ..... _

49474

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Steve Hoewenaar - Cheryl Hyatt
COMPANY: CRA-SMI
ADDRESS: 77 W. Center
CITY: Saginaw STATE: MI ZIP CODE:
PHONE NO: FAX NO: P.O. NO:
E-MAIL ADDRESS: QUOTE NO:

INVOICE TO

CONTACT NAME: SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: FAX NO: P.O. NO:

PROJECT NO./NAME: 82-59 Ottley S.A.
SAMPLER(S) - PLEASE PRINT/SIGN NAME: T Goslin

TURNAROUND TIME REQUIRED: 24 HR | 48 HR | 72 HR | STANDARD | OTHER

DELIVERABLES REQUIRED: STANDARD | LEVEL II | LEVEL III | OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE O=OIL A=AIR W=WASTE M=MISC

ANALYSIS (ATTACH LIST IF MORE SPACE REQUIRED)

SA - Ottley 3 of 3

SPECIAL INSTRUCTIONS/NOTES

MERIT LAB NO.	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	SA - Ottley
40461.01	4-16-09	11 AM	01	L	2	X							X
.02	4-16-09	11 15	02	L	11	X	X	X	X	X			X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	4-16-09	1300
RELINQUISHED BY: SIGNATURE/ORGANIZATION		
RECEIVED BY: SIGNATURE/ORGANIZATION		

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	4-16-09	15:30

SEAL NO.	SEAL INTACT YES / NO	INITIALS	NOTES: TEMP ON ARRIVAL 4.1
SEAL NO	SEAL INTACT YES / NO	INITIALS	

PLEASE NOTE: SIGNING ACKNOWLEDGES ACCEPTANCE OF TERMS & CONDITIONS ON REVERSE SIDE

ATTACHMENT 2

OPERATION AND MAINTENANCE MANUAL

TECHNICAL REPORT

7B7B
out of office

LNAPL Recovery System Operation and Maintenance Plan

Saginaw Malleable Iron Plant and
Delphi Saginaw Steering Systems
Plant 2 Properties

General Motors Corporation
Saginaw, Michigan

October 2000

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

6723 Towpath Road, P.O. Box 66
Syracuse, NY 13214-0066
(315) 446-9120

Table of Contents

Appendices

A - LNAPL Recovery System Record Drawings
B - LNAPL Recovery System Trouble Shooting
C - Manufacturers Literature and Manuals
D - Saginaw City Ground Water Discharge Approval Letter
E - LNAPL Recovery System Electrical Drawings

1. Introduction

1.1 General

This document presents an Operation and Maintenance (O&M) Plan for the light, non-aqueous phase liquid (LNAPL) recovery system at the General Motors Corporation (GM) Saginaw Malleable Iron (SMI) Plant and Delphi Saginaw Steering Systems Plant 2 properties located in Saginaw, Michigan. The LNAPL recovery system was constructed as part of the commitment to the Michigan Department of Environmental Quality (MDEQ) to install an LNAPL Recovery System Interim Response Action (IRA) pursuant to Part 201 of the Natural Resources and Environmental Protection Act (NREPA), as amended.

1.2 LNAPL Recovery System Description/Construction

The LNAPL recovery system was constructed in accordance with the LNAPL recovery system contract drawings prepared by Blasland, Bouck & Lee, Inc. (BBL) dated June 1996. Construction of the LNAPL recovery system consisted of the following major elements:

- Installation of four new recovery wells;
- Installation of LNAPL recovery and groundwater depression pumps and associated controls for the recovery wells;
- Installation of underground LNAPL and groundwater transfer piping within containment piping from each recovery well to the treatment system enclosure;
- Installation of a 20-foot by 25-foot treatment system enclosure; and
- Installation of treatment system equipment including:
  - One oil/water separator (OWS);
  - One OWS LNAPL transfer pump and associated controls;
  - One OWS water transfer pump and associated controls;
  - Two bag filters in parallel and associated controls;
  - Two granular activated carbon (GAC) units in series;
  - One treatment system enclosure sump pump and associated controls;
  - One in-line mixer (installed in August 1998);
  - One hydrogen peroxide metering pump (installed in August 1998);
  - Three LNAPL collection totes (two totes as part of the system and a third as a spare);
  - One rain gauge; and
  - One autodialer.

Construction of the LNAPL recovery system began in January 1997 and was completed in September 1997. Changes were made to the original construction in August 1998. Record drawings are provided in Appendix A.

The LNAPL recovery system consists of the following four recovery wells:

- PW-1 located 100 feet northeast of the treatment building on the GM SMI Plant Property;
- PW-2 located 700 feet southeast of the treatment building on the GM SMI Plant Property;
- PW-3 located 100 feet south of the treatment building on the GM SMI Plant Property; and
- PW-4 located 250 feet northwest of the treatment building on the Delphi Saginaw Steering System Plant 2 Property.

Each recovery well has one scavenger LNAPL pump with an LNAPL/water level control and one groundwater pump. The scavenger pumps discharge directly to one of two LNAPL totes that are located in the Treatment Building. The groundwater is pumped to a common line for all four wells in the Treatment Building. After the groundwater enters the common line, it is sent to an oil/water separator. The oil that is captured in the oil/water separator is pumped via an oil transfer pump to one of the two LNAPL totes in the Treatment Building. The water from the oil/water separator is then pumped through an additional treatment system that includes hydrogen peroxide addition, a 10 micron bag filter, and a two-unit GAC system that is used in series. The treated water is discharged to an on-site sanitary sewer .

1.3 Purpose and Organization of Plan

The purpose of this document is to establish O&M procedures that will ensure the continued effectiveness of the LNAPL recovery system. This LNAPL Recovery System O&M Plan is organized into the following five sections:

- *Section 1 – Introduction.* Presents general information about this document.
- *Section 2 – Operations and Maintenance Personnel.* Identifies the GM personnel associated with the LNAPL recovery system and outlines the training requirements for the O&M contractor.
- *Section 3 – Inspections.* Discusses inspections of the LNAPL recovery system including sampling and analysis activities.
- *Section 4 – Maintenance.* Discusses the maintenance activities that will likely be necessary to maintain the LNAPL recovery system in proper operating condition.
- *Section 5 – Transport and Disposal of LNAPL and Spent Carbon.* Discusses the requirements for the off-site transport and disposal of waste generated during O&M activities.

2. Operations and Maintenance Personnel

2.1 Site and Environmental Affairs Personnel

The table below lists the personnel associated with LNAPL recovery system O&M activities.

Company and Title	Contact	Phone Number
GM Project Coordinator	Cheryl Hiatt	(315) 556-9032
GM SMI Contact	Megan Shaffner	(517) 757-0920
GM SMI Security	Richard Saenz	(517) 757-0545
GM SMI Confined Space Entry	Rich Main	(517) 757-1038
Delphi Plant 2 Plant Control	John Krause	(517) 757-5245
Delphi Plant 2 Environmental Contact	David Seamans	(517) 757-4258

2.2 O&M Contractor Training Requirements

Routine O&M activities at the LNAPL recovery system will be conducted by an O&M contractor to be selected by GM. The O&M contractor will be responsible for implementing the O&M activities described in this plan. These activities include managing water, LNAPL, spent carbon, and other waste that could potentially contain volatile and semi-volatile organic compounds, inorganic compounds, and polychlorinated biphenyls (PCBs).

To ensure that the O&M work is completed in a safe manner, the O&M contractor will be required to prepare, submit, and implement a site-specific Health and Safety Plan (HASP). The HASP must, at a minimum, address the following items:

- For work described in this plan, the O&M contractor must comply with all federal, state, and local regulations including (but not limited to) 29 CFR Part 1910, 40 CFR 260-267 and related regulations that call for developing and implementing a safety and health program for employees involved in hazardous waste operations. The O&M contractor will be required to comply with all requirements under these regulations for this project.

- Prior to commencing field activities, the O&M contractor's manager will have had site manager training and will certify that personnel assigned to perform O&M activities at the LNAPL recovery system, including direct employees as well as subcontractors, have completed a 40-hour health and safety training course (and annual refresher training) in accordance with 29 CFR 1910. The O&M contractor will also certify that any individuals who later become employed by the O&M contractor to conduct O&M activities also attend such training prior to performing work at the LNAPL recovery system. Employees and subcontractors of the O&M contractor who are unable to demonstrate compliance with such training requirements will be limited to support roles at the LNAPL recovery system.

- The O&M contractor will certify that all personnel who will be employed by the O&M contractor to perform O&M activities at the LNAPL recovery system, including direct employees as well as subcontractors, have received the initial and annual (if applicable) medical examinations as required by 29 CFR 1910.

- The O&M contractor will comply with the Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54).

- The O&M contractor must understand and follow plant safety and environmental guidelines as presented by plant environmental personnel.

- The O&M contractor will be responsible for the safety of his employees, subcontractors, suppliers, and other parties at the work area as a result of the O&M contractor's direction.

- The HASP will also include, but not be limited to, the following components:

  - Identification of Key Personnel – Identify, by name and title, the on-site and off-site health and safety personnel responsible for implementing health and safety procedures.

  - Site Hazards – Identify and provide a means to mitigate all foreseeable chemical and physical hazards associated with the work, including, but not limited to, hazards associated with exposure to constituents of concern.

  - Work Zones – If required, the following work zones will be designated: Exclusion Zones, Decontamination Zones, and Support Zones. If personal protection is required, the level for each zone will be specified.

  - Personal Protective Equipment (PPE) and Protective Clothing – Identify PPE and protective clothing to be used and available on-site.

  - Personal and Area Air Monitoring – Identify protocols and criteria associated with personal and area air monitoring of on-site personnel. The air monitoring will address both airborne volatile constituents and fugitive particulate emissions, if required.

  - Equipment Cleaning – Describe methods and procedures to decontaminate personnel, vehicles, and equipment.

  - Contingency Plan – Develop an alternative plan for all activities associated with the O&M of the LNAPL recovery system to prevent the likelihood and to mitigate the impact of a spill of any materials brought on site by the O&M contractor. This plan should address any materials or waste related to the LNAPL recovery system, such as LNAPL-impacted water, spent carbon, and LNAPL, removed and handled by the O&M contractor.

  - Material Safety Data Sheets – Provide Material Safety Data Sheets (MSDSs) for all materials to be brought on site, as well as constituents that are expected to be encountered during O&M activities.

  - All materials brought onsite must receive prior written approval from the GM SMI contact. A notice of request to bring approved materials onsite must be submitted to GM one week prior to their use.

The O&M contractor will determine the appropriate level of worker safety equipment and procedures based on site visit(s) and review of available information as deemed necessary. Should any unforeseen or site-specific safety-related factor, hazard, or condition become evident during the performance of work at the

LNAPL recovery system, it will be the O&M contractor's responsibility to bring such to the attention of the GM on-site representative both verbally and in writing as quickly as possible for resolution. In the interim, the O&M contractor will take prudent action to establish and maintain safe working conditions and to safeguard employees, the public, and the environment.

2.3 Reporting Requirements

The O&M contractor must immediately notify GM verbally of any issues or problems with the operation of the LNAPL recovery system and document the issue or problem and the resolution to the issue or problem within two weeks.

The O&M contractor will be responsible for preparing a monthly LNAPL recovery system O&M Report for GM with the following contents:

- Written narrative that summarizes the prior month's O&M activities and the current status of the LNAPL recovery system;
- LNAPL Recovery System Inspection Log;
- LNAPL Recovery System Maintenance Log;
- Records of equipment, manpower, and materials used during O&M activities;
- Records of the quantity of water treated and discharged;
- Records of the quantity of LNAPL recovered;
- Records of sample analytical results, as generated;
- Disposal records for spent carbon and LNAPL, as generated; and
- Records of the quantity of hydrogen peroxide used.

The O&M contractor will also be responsible for preparing an annual LNAPL Recovery System O&M Summary Report for GM's submittal to the MDEQ. This report will provide a summary of key information from the monthly reports such as quantity of water treated, quantity of LNAPL recovered, sample analytical results, etc.

3. Inspections

3.1 General

The O&M contractor will conduct weekly inspections of the LNAPL recovery system to obtain operating data and to identify any required maintenance activities. The inspections and associated maintenance will be conducted to ensure the continued effectiveness of the LNAPL recovery system. The inspections will include assessing the LNAPL recovery system components; collecting operating data; collecting water, LNAPL, and spent carbon samples, as required; performing maintenance procedures; and routine housekeeping (e.g., trash removal, general cleaning, etc.). Results of the inspections will be recorded on an LNAPL Recovery System Inspection Log, included in this plan as Table 1, and retained at the facility. The LNAPL recovery system layout and components are shown on the record drawings included in this plan as Appendix A.

3.2 LNAPL Recovery Well Inspections

Each of the four recovery wells are located within 48-inch-diameter by 48-inch-deep concrete manholes. Access to each manhole is provided by a heavy-duty, 24-inch by 24-inch iron cover. Access into the manhole shall be performed using an appropriate harness and tripod-lifting device to lower the individual into the structure and follow all confined space entry rules and regulations. This includes having a trained individual outside the manhole during entry. A permit must be obtained from the plant prior to entry. During manhole entry, the area around the manhole shall be temporarily barricaded to reroute traffic around the manhole. At the end of the inspection, the manhole cover is to be closed and the temporary barricade is to be removed. Within each manhole is an 18-inch-diameter well riser pipe that contains an LNAPL recovery pump and a groundwater depression pump. Also within each manhole is a ½-inch-diameter nylon LNAPL transfer hose, one-inch-diameter rubber groundwater transfer hose, associated valves, and electrical power and control wiring. The LNAPL and groundwater transfer hoses enter a 3-inch-diameter containment pipe at the exit point of each manhole and continue through the 3-inch-diameter containment pipe until entry into the treatment enclosure.

Each recovery well will be inspected to determine the structural integrity of the concrete manhole and cover, the well riser pipe/concrete grout seal, and the LNAPL and groundwater pumps, transfer hoses, electrical wires, and valves. The hoses and valves within the manhole will be inspected for any sign of leakage, and the containment pipe will be inspected to determine if either the LNAPL or groundwater transfer hoses are leaking between the manhole and the treatment enclosure.

At a minimum, the LNAPL thickness will be measured once per month at well locations RW-1, RW-2, RW-3, RW-4, MW-147WT, MW-148WT, MW-157WT, MW-158WT, MW-160WT, MW-168WT, MW-172WT, MW-175WT, MW-178WT, and TP-2. Based on thickness and distribution found at the above well locations, more wells may be added to the LNAPL measuring program.

3.3 Treatment Enclosure and Associated Equipment Inspections

The LNAPL recovery system equipment (other than the LNAPL and groundwater well pumps) is located within an insulated, ventilated, and heated 20-foot by 25-foot enclosure. The LNAPL recovery system equipment includes the following major components:

Equipment Description	Equipment Purpose
OWS	Separates LNAPL from groundwater pumped from recovery wells.
OWSLNAPL Transfer Pump	Transfers LNAPL collected in the OWS to LNAPL collection totes.
OWS Water Transfer Pump	Transfers groundwater collected in OWS to other groundwater treatment equipment.
Hydrogen Peroxide Metering Pump	Introduces a metered amount of hydrogen peroxide to the in-line mixer.
In-Line Mixer	Mixes a metered amount of hydrogen peroxide into groundwater stream.
Bag Filter Units	Removes particulates and emulsified LNAPL from water to minimize fouling of GAC units.
GAC Units	Removes PCBs, other organics, and metals from groundwater prior to discharge to on-site sanitary sewer.
Treatment Enclosure Sump Pump	Transfers any LNAPL or water collected in the treatment building sump to the OWS.
LNAPL Collection Totes	Provides temporary storage for LNAPL pending sampling, analysis, and disposal.

Other ancilliatory equipment includes manual and automatic valves; pressure gauges; pressure switches; treated groundwater discharge flow meter; pump on and off switches for the OWS and treatment building sump; and high level alarm switches for the OWS, the treatment building sump, LNAPL collection totes, and HVAC system.

The following inspections will be performed on each component of the LNAPL recovery system:

- OWS – To verify structural integrity and proper operation per manufacturer's literature.
- OWS LNAPL transfer pump – To verify proper operation per manufacturer's literature.
- In-line mixer – To verify proper operation per manufacturer's literature.
- Hydrogen peroxide metering pump – To verify proper operation per manufacturer's literature.
- OWS water transfer pump – To verify proper operation per manufacturer's literature.
- Bag filter units – For accumulation of solids or fouling that could effect filter performance. Pressure drop through the bag filter unit(s) will be determined using the pressure gauges located upstream and downstream of the bag filter unit(s).
- GAC filter units – For structural integrity and proper operation per manufacturer's literature. Pressure drop through the GAC filter units will be determined using the pressure gauges located upstream and downstream of the GAC filter units.
- LNAPL collection totes – For structural integrity and volume of collected LNAPL. Volume of collected LNAPL must be tracked on an Access® database or Excel® spreadsheet for reporting to the state.

- LNAPL process piping – For structural integrity. Pressure gauges on the process piping will be checked and pressure differentials along the process piping will be calculated to estimate scaling and fowling of the process piping.

- Treatment enclosure – For structural integrity and proper operation of floor, roof, siding, doors, and protective bollards.

- Treatment enclosure sump and sump pump – For structural integrity and proper operations using manufacturer's literature.

- Treatment enclosure HVAC and lighting systems – To verify proper operation per manufacturer's literature.

- Check calibration of LEL meter.

- General check for leaks in piping and tanks.

- General housekeeping and cleaning of treatment building.

3.4 Sampling and Analysis

The O&M contractor will be responsible for the sampling and analysis of treated groundwater, collected LNAPL, and spent carbon.

Treated groundwater collected after the secondary GAC unit will be sampled and analyzed twice monthly for the following constituents:

- Volatile organic compounds (VOCs) using USEPA Method 8260;
- Semi-Volatile Organic Compounds (SVOCs) using USEPA Method 8270;
- Polychlorinated biphenyls (PCBs) using USEPA Method 608;
- Inorganics using USEPA 6010 and 7000 Series; and
- Flash point USEPA Method 1010.

Treated groundwater collected after the primary GAC unit will also be sampled and analyzed for the following constituents:

- PCBs using USEPA Method 608.

The collected LNAPL and spent carbon will be sampled and analyzed, as needed, for disposal characterization as required by the GM national disposal contractor. For the purposes of this plan, the following parameters are assumed:

- VOCs using USEPA Method 8260;
- SVOCs using USEPA Method 8270;
- PCBs using USEPA Method 8080;
- Total petroleum hydrocarbons (TPHs) using USEPA Method 418.1;
- TCLP, VOCs, SVOCs, and 10 Michigan metals;
- Flash point EPA Method 1010;

- pH;
- Reactivity; and
- Total sulfide.

Prior to sampling and analysis, GM must provide approval of the analytical laboratory selected by the O&M contractor.

3.5 Recordkeeping and Reporting

The information collected by the O&M contractor during the LNAPL recovery system inspections will be recorded on the LNAPL Recovery System Inspection Log, included as Table 1 in this plan, and transferred to an electronic media such as Access® or Excel®. This database or spreadsheet shall be maintained and updated as needed. The inspection log and records of samples taken and analytical results will be included in the O&M contractor's annual report to the GM site contact.

4. Maintenance

4.1 General

The O&M contractor will perform various routine maintenance tasks to ensure the ongoing effectiveness of the LNAPL recovery system, and will also perform any maintenance needed to correct problems identified during the LNAPL recovery system inspections. All maintenance activities will be recorded on an LNAPL Recovery System Maintenance Log, included with this plan as Table 2. All maintenance will be conducted according to applicable equipment warranties and per the Operation and Maintenance Manuals provided by equipment vendors for the LNAPL recovery system. Appendix C to this plan contains the Operation and Maintenance Manuals and warranties provided from vendors. PPE will be worn in accordance with the LNAPL Recovery System HASP.

4.2 Frequency

The O&M contractor will perform routine maintenance during the weekly inspection of the LNAPL recovery system. Non-routine maintenance will be performed as soon as is feasible when a problem has been identified. Problems that threaten worker health and safety or the environment must be dealt with as soon as possible, and within two hours of notification. The O&M contractor shall notify GM of any non-routine required repairs prior to completing the repairs, although notification will not hold up any urgent repairs. All non-routine system repairs will be addressed in a timely manner. All alarms will be acknowledged within 24 to 48 hours of the alarm.

4.3 LNAPL Recovery Well Maintenance

The O&M contractor will clean debris off of the LNAPL recovery well concrete manholes and hinged cast iron covers so that the hinged covers operate properly. Any cracks or leaks in the concrete manhole, broken hinges, or leaks at conduit and pipe penetration seals will be repaired. Recovery wells with covers open or removed will be temporarily barricaded at all times to prevent traffic accidents. At a minimum, the O&M contractor will perform the following routine maintenance procedures on the LNAPL recovery well pumps, hoses, valves, hand cranks, steel cables, electrical cables, and connectors and appurtenances.

Equipment Description	Routine Maintenance Procedures
LNAPL Pump	• Check pump discharge flow rate; • Measure thickness of LNAPL layer in well; • Maintain pump per manufacturer's recommendations; and • Clean pump and remove any accumulated dirt.
Water Pump	• Check pump discharge flow rate; • Check pump motor current draw and compare to appropriate motor current draw found in pump manufacturer's literature; • Maintain pump per manufacturer's recommendations; and • Clean pump and remove any accumulated dirt.
Metering Pump	• Check pump performance against manufacturer's literature; • Maintain pump per manufacturer's recommendations; and • Clean pump and remove any accumulated dirt.

Equipment Description	Routine Maintenance Procedures
Hand Crank and Steel Cable	• Check for proper crank operation and condition of steel cable.
LNAPL and Water Discharge Hoses and Valves	• Check condition of hoses and valves.
Electrical Power and Control Cables	• Check condition of electrical power and control cables.

The O&M contractor will also perform any other non-routine maintenance activities necessary to keep the LNAPL recovery pumps in good working condition.

4.4 Treatment Enclosure and Associated Equipment Maintenance

The O&M contractor will, at a minimum, perform the following routine maintenance procedures:

Equipment Description	Routine Maintenance Procedures
Treatment Enclosure	• Maintain heated pre-engineered building per manufacturer's recommendations. • Maintain heated pre-engineered building in a clean, neat, and organized condition.
Treatment Enclosure Sump Pump	• Maintain per manufacturer's recommendations.
OWS	• Clean coalescing screen as needed and maintain unit per manufacturer's recommendations.
OWS LNAPL Transfer Pump	• Maintain per manufacturer's recommendations.
OWS Water Transfer Pump	• Maintain per manufacturer's recommendations.
Hydrogen Peroxide Pump	• Maintain per manufacturer's recommendations.
Bag Filter Units	• Provide replacement filters and replace bag filter elements as needed when the differential pressure increases and maintain filter housings per manufacturer's recommendations.
GAC Filter Units	• Replace carbon in primary GAC unit if analytical results of monthly water testing indicate breakthrough of PCBs in the primary unit. During carbon replacement, the primary GAC unit will be replaced with the secondary GAC unit and the newly rebedded carbon unit will be positioned as the secondary GAC unit. • Allow carbon to sit in water 8 to 12 hours after filling to allow air to leave system.
LNAPL Collection Totes	• Clean high level float and switches as needed to maintain proper operation; • Drain off any water that accumulates in the collection tote to the enclosure sump using drain valve and hose at bottom of collection tote; and • Transfer LNAPL into GM-provided containers, as needed, to maintain sufficient LNAPL storage capacity.
Process Control Panel	• Maintain per manufacturer's recommendations.
Autodialer	• Maintain per manufacturer's recommendations.
Rain Gauge	• Maintain per manufacturer's recommendations.
LEL Meter	• Calibrate per manufacturer's recommendations.

The O&M contractor will also perform other non-routine maintenance activities such as cleaning or replacing well pumps, replacing cut or cracked hoses and electrical cables, making repairs to treatment enclosure and floor, or other measures necessary to keep the LNAPL recovery system equipment in good working condition.

4.5 LNAPL Recovery System Settings

The LNAPL recovery system is designed to run in automatic operation. The following settings are needed to run the system in automatic operation:

- RW-1 through RW-4 – Must be set up in automatic operation. This allows for on-site operation of pump functions using panel controls and indicators;
- Water transfer pumps – Automatic operation;
- Oil transfer pumps – Automatic operation;
- Treatment Building sump pump – Automatic operation; and
- Hydrogen peroxide metering pump – 1.0 to 2.0 parts per million at effluent to the bag filters.

The hydrogen peroxide solution concentration is to be 25 percent solution.

4.6 Trouble Shooting

The LNAPL recovery system is made up of the following five subsystems:

- Recovery wells;
- OWS, transfer pumps, and sump pump;
- Hydrogen peroxide metering pump;
- Bag filters and GAC vessels;
- LNAPL totes; and
- Treatment system enclosure.

A troubleshooting table for these subsystems can be found in Appendix B.

4.7 Recordkeeping and Reporting

The maintenance performed by the O&M contractor will be recorded on the LNAPL Recovery System Maintenance Log included with this plan as Table 2. The maintenance log will be included in the O&M contractor's annual report to the GM site contact.

5. Transport and Disposal of LNAPL and Spent Carbon

5.1 General

The O&M contractor will be responsible for the on-site transport of waste materials generated during operation of the LNAPL recovery system to the GM/SMI Plant designated storage area (the PCB cage or the hazardous materials cage), including providing all labor, equipment, and materials needed for the on-site transport of recovered LNAPL, spent carbon, and other waste generated during O&M activities. The O&M contractor must arrange to change out the spent carbon. The O&M contractor will be responsible for labeling all waste containers in accordance with DOT regulations at 49 CFR 107 and 171-189, as well as applicable RCRA and TSCA regulations.

5.2 Off-Site Transport and Disposal

The O&M contractor will be responsible for on-site handling and coordinating with GM environmental personnel for the off-site transport and disposal of the recovered LNAPL, spent carbon, and other waste generated during O&M activities. The O&M contractor will be responsible for the proper storage, labeling, and manifesting; obtaining shipping documents for GM; and arranging for disposal and supervision of disposal in the proper timeframe. GM has the final responsibility for off-site transport and disposal of LNAPL recovery system wastes. The O&M contractor will arrange for disposal and incineration of LNAPL, PPE, spent carbon, sediment from wells, and any other waste. A responsible representative from the O&M contractor must be there during removal of LNAPL, PPE, spent carbon, sediment from wells, and any other waste.

5.3 PPE Disposal

The O&M contractor will dispose of all PPE by bagging the PPE and placing it in a drum. Every drum will be labeled with its contents and an accumulation date.

5.4 Sampling and Analysis

The O&M contractor will be responsible for treated groundwater and waste characterization sampling as described in Section 3.4 of this plan.

5.5 Controls and Contingencies

The O&M contractor will be responsible for preparing, submitting, and implementing a Contingency Plan as part of the HASP. This plan must be prepared in coordination with plant personnel and must incorporate the following plant guidelines:

- A spill prevention control and countermeasure plan for all materials brought to the site and waste material generated during LNAPL and spent carbon removal activities. All hazardous materials must have received authorization to be brought onsite by plant environmental personnel.

- Emergency vehicular access/egress.

- Evacuation procedures for personnel from the site.

- A list of all contact personnel with phone numbers, including the plant security personnel, O&M contractor; GM personnel; fire officials; ambulance service; local, county, and state police; and local hospitals, including routes to local hospitals and procedures for notifying each.

- Method to contain gasoline/diesel fuel spills if these fuels are to be brought into the limits of the work area. No additional compensation will be provided to the O&M contractor for work related to cleaning up spills or leaks caused by the O&M contractor's personnel or equipment.

5.6 Recordkeeping and Reporting

The O&M contractor will keep records of all transport and disposal activities. The records will contain, at a minimum, all the analytical data, and the quantity and type of containers used for each waste stream transported and disposed of off-site. The records will also include copies of all hazardous waste manifests and shipping papers. Original copies of waste manifests and shipping papers must be sent to the GM Worldwide Facilities Group with copies to the GM SMI-Environmental Engineering Group. This information will be included in the O&M contractor's annual report to the GM site contact.

Tables

Table 1 – LNAPL Recovery System Inspection Log

Table 1

General Motors Corporation
Saginaw, Michigan

LNAPL Recovery System Inspection Log

A. Visual Inspections

Recovery Wells	RW-1 Yes/No	RW-2 Yes/No	RW-3 Yes/No	RW-4 Yes/No	If No/Items to Check[1]	Description of Condition/Unusual Circumstances
Concrete manhole and cover in good condition?					Replace as needed	
Does interior of concrete manhole require cleaning to remove water, oil, and dirt?					Clean as needed	
Well riser pipe and concrete grout seal to bottom of manhole in good condition?					Replace grout	
LNAPL and groundwater transfer hoses and valves in good condition?					1-4	
Electrical power and control cables in good condition?					1-4	
LNAPL and groundwater pumps operating properly?					1-4	
Hand crank and steel cable in good condition?					1-4	
Any water on floor of manhole interior?					1-4	
Any LNAPL on floor of manhole interior?					1-4	
Any LNAPL in well? (If yes, record LNAPL layer thickness in yes/no column)						
Autodialer operating properly?					See vendor-supplied O&M manual	
Rain gauge operating properly?					Check level indicator	
OWS in good condition and operating properly?					5	
OWS LNAPL transfer pump in good condition and operating properly?					6-11	
Hydrogen Peroxide System in good condition and operating properly?					15-17	
OWS water transfer pump in good conditon and operating properly?					12-13	
Bag filter unit(s) in good condition and operating properly?					18	

Notes:
1 Refer to Appendix B for items to check.

LNAPL Recovery System Inspection Log

A. Visual Inspections

Recovery Wells	RW-1 Yes/No	RW-2 Yes/No	RW-3 Yes/No	RW-4 Yes/No	If No/Items to Check[1]	Description of Condition/Unusual Circumstances
Differential pressure across the bag filter ok?					18	
GAC filter unit(s) in good condition and operating properly?					19	
Differential pressure across the GAC filter ok?					19	
LNAPL collection totes in good condition?					20, and replace as needed	
Treatment enclosure interior in neat and well-organized condition and floor is clean?					Cleanup treatment area	
Treatment enclosure sump and sump pump in good condition and operating properly?					14	
Treatment enclosure, including HVAC and lighting systems, in good condition and operating properly?					21-28	
Treatment enclosure doors and door locks in good working order?					Replace as needed	
LEL monitor working properly?					Refer to vendor-supplied O&M manual	
Exterior alarm lights working properly?					22	
Electrical cords, conduit, panels, and other electrical equipment in good condition and operating properly?					Replace as needed	

Notes:

1 Refer to Appendix B for items to check.

Table 1
(Cont'd)
General Motors Corporation
Saginaw, Michigan

LNAPL Recovery System Inspection Log

B. Pressure Readings

Bag Filter Unit(s)	In Run (Yes/No)	Inlet Pressure	Discharge Pressure	Pressure Drop (Inlet-Discharge Pressure)
Bag Filter No. 1		psig	psig	psig
Bag Filter No. 2		psig	psig	psig

GAC Filter Unit(s)	In Run (Yes/No)	Inlet Pressure	Discharge Pressure	Pressure Drop (Inlet-Discharge Pressure)
Primary GAC Unit		psig	psig	psig
Secondary GAC Unit		psig	psig	psig

C. Recovery Well LNAPL Pump Run Times

Equipment	Hours of Operation		
	Current Reading (Hours)	Previous Reading (Hours)	Operating Time Since Previous Reading (Hours)
RW-1 LNAPL Pump			
RW-2 LNAPL Pump			
RW-3 LNAPL Pump			
RW-4 LNAPL Pump			

LNAPL Recovery System Inspection Log

D. LNAPL Recovered from Each Recovery Well

- RW-1 total operating time ____Hr x RW-1 LNAPL pumping rate 40 gphr = ____ total gallons LNAPL recovered from RW-1.

  RW-1 operating time since previous reading ____Hr x RW-1 LNAPL pumping rate 40 gphr = ____ gallons LNAPL recovered from RW-1 since previous reading.

- RW-2 total operating time ____Hr x RW-2 LNAPL pumping rate 40 gphr = ____ total gallons LNAPL recovered from RW-2.

  RW-2 operating time since previous reading ____Hr x RW-2 LNAPL pumping rate 40 gphr = ____ gallons LNAPL recovered from RW-2 since previous reading.

- RW-3 total operating time ____Hr x RW-3 LNAPL pumping rate 40 gphr = ____ total gallons LNAPL recovered from RW-3.

  RW-3 operating time since previous reading ____Hr x RW-3 LNAPL pumping rate 40 gphr = ____ gallons LNAPL recovered from RW-3 since previous reading.

- RW-4 total operating time ____Hr x RW-4 LNAPL pumping rate 40 gphr = ____ total gallons LNAPL recovered from RW-4.

  RW-4 operating time since previous reading ____Hr x RW-4 LNAPL pumping rate 40 gphr = ____ gallons LNAPL recovered from RW-4 since previous reading.

Note: Actual LNAPL pumping rate for each recovery well will vary and needs to be physically measured during start-up activities. The 40 gallon-per-hour rate (gphr) shown is indicative of maximum pumping conditions.

E. Current Volume of Collected LNAPL

LNAPL Collection Tote No. 1 _____gallons
LNAPL Collection Tote No. 2 _____gallons
LNAPL Collection Tote No. 3 (spare) _____gallons

Table 1
(Cont'd)
General Motors Corporation
Saginaw, Michigan

LNAPL Recovery System Inspection Log

F. Treated Water Flow Readings

	Current Instaneous Flow (Gallons Per Minute)	Current Total Meter Reading (Gallons)	Previous Total Meter Reading (Gallons)	Volume Since Previous Reading (Gallons)
Treated water discharge				

G. Comments

_____

_____

_____

Date: _____ Time: _____

Inspector: _____ (print)

_____ (sign)

Table 2 – LNAPL Recovery System Maintenance Log

Table 2

General Motors Corporation
Saginaw, Michigan

LNAPL Recovery System Maintenance Log

LNAPL Recovery System Recovery Wells and Equipment	Description of Maintenance Performed
Recovery Well RW-1	
Recovery Well RW-2	
Recovery Well RW-3	
Recovery Well RW-4	
Treatment Enclosure	
Treatment Enclosure Sump Pump	
OWS	
OWS LNAPL Transfer Pump	
OWS Water Transfer Pump	
Hydrogen Peroxide System	
Bag Filter Units	

Table 2

General Motors Corporation
Saginaw, Michigan

LNAPL Recovery System Maintenance Log

LNAPL Recovery System Recovery Wells and Equipment	Description of Maintenance Performed
GAC Filter Units	
LNAPL Collection Totes	
Other	

Date: _____ Time: _____

Inspector: _____ (print)

_____ (sign)

Appendix A – LNAPL Recovery System Record Drawings

BLASLAND, BOUCK & LEE, INC.

engineers & scientists

ATTACHMENT 3

MSDS FOR HYDROGEN PEROXIDE

MATERIAL SAFETY DATA SHEET

Hydrogen Peroxide (20 to 40%)

MSDS Ref. No.: 7722-84-1-3
Date Approved: 06/03/2008
Revision No.: 11

This document has been prepared to meet the requirements of the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200 and Canada's Workplace Hazardous Materials Information System (WHMIS) requirements.

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Hydrogen Peroxide (20 to 40%)

ALTERNATE PRODUCT NAME(S): Durox® Reg. & LR 35%, Oxypure® 35%, Standard 27.5 & 35%, Super D® 25 & 35, Technical 35%, HTP 35%, OHP 35%, Chlorate Grade, 20%, Semiconductor Reg, Seg, RGS, RGS 2, RGS 3, 31%

GENERAL USE:

Durox® 35% Reg. & LR - meets the Food Chemical Codex requirements for aseptic packaging and other food related applications.

Oxypure® 35% - certified by NSF to meet NSF/ANSI Standard 60 requirements for drinking water treatment.

Standard 27.5 and 35% - most suitable grade for industrial bleaching, processing, pollution abatement and general oxidation reactions.

Semiconductor Reg, Seg, RGS, RGS 2, RGS 3, 31% - conform to ACS and Semi Specs. for wafer etching and cleaning, and applications requiring low residues.

Super D® 25 and 35% - meets US Pharmacopoeia specifications for 3% topical solutions when diluted with proper quality water. While manufactured to the USP standards for purity and to FMC's demanding ISO 9002 quality standards, FMC does not claim that it's Hydrogen Peroxide is manufactured in accordance with all pharmaceutical cGMP conditions.

Technical 35% - essentially free of inorganic metals suitable for chemical synthesis.

HTP 35% - specially formulated for aerospace equipment conditioning.

OHP 35% - specially formulated for OHP process, advanced oxidation, and activated peroxide applications

Chlorate Grade 20% - specially formulated for use in chlorate manufacture or processing.

MANUFACTURER

FMC CORPORATION
FMC Peroxygens
1735 Market Street
Philadelphia, PA 19103
(215) 299-6000 (General Information)
msdsinfo@fmc.com (Email - General Information)

FMC of Canada Ltd.
FMC Peroxygens
PG Pulp Mill Road
Prince George, BC V2N2S6
(250) 561-4200 (General Information)

EMERGENCY TELEPHONE NUMBERS

(281) 474-8750 (Plant: Pasadena, TX, US - Call Collect)
(250) 561-4221 (Plant: Prince George, BC, Canada - Call Collect)
(303) 595-9048 (Medical - U.S. - Call Collect)

For leak, fire, spill, or accident emergencies, call:
(800) 424-9300 (CHEMTREC - U.S.A.)
(613) 996-6666 (CANUTEC - Canada)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

- Clear, colorless, odorless liquid
- Oxidizer.
- Contact with combustibles may cause fire.
- Decomposes yielding oxygen that supports combustion of organic matters and can cause overpressure if confined.
- Corrosive to eyes, nose, throat, lungs and gastrointestinal tract.

POTENTIAL HEALTH EFFECTS: Corrosive to eyes, nose, throat and lungs. May cause irreversible tissue damage to the eyes including blindness. May cause skin irritation.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt.%	EC No.	EC Class
Hydrogen Peroxide	7722-84-1	20 - 40	231-765-0	O, C, Xn; R5- R8-R35-R20/22
Water	7732-18-5	60 - 80	231-791-2	Not classified

4. FIRST AID MEASURES

EYES: Immediately flush with water for at least 15 minutes, lifting the upper and lower eyelids intermittently. See a medical doctor or ophthalmologist immediately.

SKIN: Wash with plenty of soap and water. Get medical attention if irritation occurs and persists.

INGESTION: Rinse mouth with water. Dilute by giving 1 or 2 glasses of water. Do not induce vomiting. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

INHALATION: Remove to fresh air. If breathing difficulty or discomfort occurs and persists, contact a medical doctor.

NOTES TO MEDICAL DOCTOR: Hydrogen peroxide at these concentrations is a strong oxidant. Direct contact with the eye is likely to cause corneal damage especially if not washed immediately. Careful ophthalmologic evaluation is recommended and the possibility of local corticosteroid therapy should be considered. Because of the likelihood of corrosive effects on the gastrointestinal tract after ingestion, and the unlikelihood of systemic effects, attempts at evacuating the stomach via emesis induction or gastric lavage should be avoided. There is a remote possibility, however, that a nasogastric or orogastric tube may be required for the reduction of severe distension due to gas formation.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Flood with water.

FIRE / EXPLOSION HAZARDS: Product is non-combustible. On decomposition releases oxygen which may intensify fire.

FIRE FIGHTING PROCEDURES: Any tank or container surrounded by fire should be flooded with water for cooling. Wear full protective clothing and self-contained breathing apparatus.

FLAMMABLE LIMITS: Non-combustible

SENSITIVITY TO IMPACT: No data available

SENSITIVITY TO STATIC DISCHARGE: No data available

6. ACCIDENTAL RELEASE MEASURES

RELEASE NOTES: Dilute with a large volume of water and hold in a pond or diked area until hydrogen peroxide decomposes. Hydrogen peroxide may be decomposed by adding sodium metabisulfite or sodium sulfite after diluting to about 5%. Dispose according to methods outlined for waste disposal.

Combustible materials exposed to hydrogen peroxide should be immediately submerged in or rinsed with large amounts of water to ensure that all hydrogen peroxide is removed. Residual hydrogen peroxide that is allowed to dry (upon evaporation hydrogen peroxide can concentrate) on organic materials such as paper, fabrics, cotton, leather, wood or other combustibles can cause the material to ignite and result in a fire.

7. HANDLING AND STORAGE

HANDLING: Wear chemical splash-type monogoggles and full-face shield, impervious clothing, such as rubber, PVC, etc., and rubber or neoprene gloves and shoes. Avoid cotton, wool and leather. Avoid excessive heat and contamination. Contamination may cause decomposition and generation of oxygen gas which could result in high pressures and possible container rupture. Hydrogen peroxide should be stored only in vented containers and transferred only in a prescribed manner (see FMC Technical Bulletins). Never return unused hydrogen peroxide to original container, empty drums should be triple rinsed with water before discarding. Utensils used for handling hydrogen peroxide should only be made of glass, stainless steel, aluminum or plastic.

STORAGE: Store drums in cool areas out of direct sunlight and away from combustibles. For bulk storage refer to FMC Technical Bulletins.

COMMENTS: VENTILATION: Provide mechanical general and/or local exhaust ventilation to prevent release of vapor or mist into the work environment.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name	ACGIH	OSHA	Supplier
Hydrogen Peroxide	1 ppm (TWA)	1 ppm (PEL) 1.4 mg/m^3 (PEL)	

ENGINEERING CONTROLS: Ventilation should be provided to minimize the release of hydrogen peroxide vapors and mists into the work environment. Spills should be minimized or confined immediately to prevent release into the work area. Remove contaminated clothing immediately and wash before reuse.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Use chemical splash-type monogoggles and a full-face shield made of polycarbonate, acetate, polycarbonate/acetate, PETG or thermoplastic.

RESPIRATORY: If concentrations in excess of 10 ppm are expected, use NIOSH/DHHS approved self-contained breathing apparatus (SCBA), or other approved atmospheric-supplied respirator (ASR) equipment (e.g., a full-face airline respirator (ALR)). DO NOT use any form of air-purifying respirator (APR) or filtering facepiece (AKA dust mask), especially those containing oxidizable sorbants such as activated carbon.

PROTECTIVE CLOTHING: For body protection wear impervious clothing such as an approved splash protective suit made of SBR Rubber, PVC (PVC Outershell w/Polyester Substrate), Gore-Tex (Polyester trilaminate w/Gore-Tex), or a specialized HAZMAT Splash or Protective Suite (Level A, B, or C). For foot protection, wear approved boots made of NBR, PVC, Polyurethane, or neoprene. Overboots made of Latex or PVC, as well as firefighter boots or specialized HAZMAT boots are also permitted. DO NOT wear any form of boot or overboots made of nylon or nylon blends. DO NOT use cotton, wool or leather, as these materials react RAPIDLY with higher concentrations of hydrogen peroxide. Completely submerge hydrogen peroxide contaminated clothing or other materials in water prior to drying. Residual hydrogen peroxide, if allowed to dry on materials such as paper, fabrics, cotton, leather, wood or other combustibles can cause the material to ignite and result in a fire.

GLOVES: For hand protection, wear approved gloves made of nitrile, PVC, or neoprene. DO NOT use cotton, wool or leather for these materials react RAPIDLY with higher concentrations of hydrogen peroxide. Thoroughly rinse the outside of gloves with water prior to removal. Inspect regularly for leaks.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR:	Odorless
APPEARANCE:	Clear, colorless liquid
AUTOIGNITION TEMPERATURE:	Non-combustible
BOILING POINT:	103ºC/218ºF (20%); 107ºC/225ºF (31%); 108ºC/226ºF (35%)
COEFFICIENT OF OIL / WATER:	Not available
DENSITY / WEIGHT PER VOLUME:	Not available
EVAPORATION RATE:	> 1 (Butyl Acetate = 1)
FLASH POINT:	Non-combustible
FREEZING POINT:	-15ºC/6ºF (20%); -26ºC/-15ºF (31%); -33ºC/-27ºF (35%)
ODOR THRESHOLD:	Not available
OXIDIZING PROPERTIES:	Strong oxidizer
PERCENT VOLATILE:	100
pH:	<= 3.7 5.0 - 6.0 @ 25 °C (1% solution)
SOLUBILITY IN WATER:	100 %
SPECIFIC GRAVITY:	1.07 @ 20ºC/4ºC (20%); 1.11 @ 20ºC/4ºC (31%); 1.13 @ 20ºC/4ºC (35%)
VAPOR DENSITY:	(Air = 1): Not available
VAPOR PRESSURE:	28 mmHg @ 30ºC (20%); 24 mmHg @ 30ºC (31%); 23 mmHg @ 30ºC (35%)

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID:	Excessive heat or contamination could cause product to become unstable.
STABILITY:	Stable (heat and contamination could cause decomposition)
POLYMERIZATION:	Will not occur
INCOMPATIBLE MATERIALS:	Reducing agents, wood, paper and other combustibles, iron and other heavy metals, copper alloys and caustic.
HAZARDOUS DECOMPOSITION PRODUCTS:	Oxygen which supports combustion.

COMMENTS: Materials to Avoid : Dirt, organics, cyanides and combustibles such as wood, paper, oils, etc.

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS: 35% hydrogen peroxide: Extremely irritating/corrosive (rabbit) [FMC Study Number: I83-748]

SKIN EFFECTS: 35% hydrogen peroxide: Mildly irritating after 4-hour exposure (rabbit) [FMC Study Number: I83-747]

DERMAL LD_{50}: 35% hydrogen peroxide: > 2,000 mg/kg (rabbit) [FMC Study Number: I83-746]

ORAL LD_{50}: 35% hydrogen peroxide: 1,193 mg/kg (rat) [FMC Study Number: I83-745]

INHALATION LC_{50}: 50% hydrogen peroxide: > 0.17 mg/l (rat) [FMC Study Number: I89-1080]

TARGET ORGANS: Eyes, nose, throat and lungs

ACUTE EFFECTS FROM OVEREXPOSURE: Extremely irritating/corrosive to eyes and gastrointestinal tract. May cause irreversible tissue damage to the eyes including blindness. Inhalation of mist or vapors may be severely irritating to nose, throat and lungs. May cause skin irritation.

CHRONIC EFFECTS FROM OVEREXPOSURE: The International Agency for Research on Cancer (IARC) has concluded that there is inadequate evidence for carcinogenicity of hydrogen peroxide in humans, but limited evidence in experimental animals (Group 3 - not classifiable as to its carcinogenicity to humans). The American Conference of Governmental Industrial Hygienists (ACGIH) has concluded that hydrogen peroxide is a 'Confirmed Animal Carcinogen with Unknown Relevance to Humans' (A3).

CARCINOGENICITY:

Chemical Name	IARC	NTP	OSHA	Other
Hydrogen Peroxide	Not listed	Not listed	Not listed	(ACGIH) Listed (A3, Animal Carcinogen)

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION: Channel catfish 96-hour LC_{50} = 37.4 mg/L
Fathead minnow 96-hour LC_{50} = 16.4 mg/L
Daphnia magna 24-hour EC_{50} = 7.7 mg/L
Daphnia pulex 48-hour LC_{50} = 2.4 mg/L
Freshwater snail 96-hour LC_{50} = 17.7 mg/L
For more information refer to ECETOC "Joint Assessment of Commodity Chemicals No. 22, Hydrogen Peroxide." ISSN-0773-6339, January 1993

CHEMICAL FATE INFORMATION: Hydrogen peroxide in the aquatic environment is subject to various reduction or oxidation processes and decomposes into water and oxygen. Hydrogen peroxide half-life in freshwater ranged from 8 hours to 20 days, in air from 10-20 hrs. and in soils from minutes to hours depending upon microbiological activity and metal contaminants.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: An acceptable method of disposal is to dilute with a large amount of water and allow the hydrogen peroxide to decompose followed by discharge into a suitable treatment system in accordance with all regulatory agencies. The appropriate regulatory agencies should be contacted prior to disposal.

14. TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT)

PROPER SHIPPING NAME:	Hydrogen peroxide, aqueous solutions with not less than 20% but not more than 40% hydrogen peroxide
PRIMARY HAZARD CLASS / DIVISION:	5.1 (Oxidizer)
UN/NA NUMBER:	UN 2014
PACKING GROUP:	II
LABEL(S):	Oxidizer, Corrosive
PLACARD(S):	5.1 (Oxidizer)

ADDITIONAL INFORMATION:

DOT Marking: Hydrogen Peroxide, aqueous solution with not less than 20%, but not more than 40% Hydrogen Peroxide, UN 2014

Hazardous Substance/RQ: Not applicable

49 STCC Number: 4918775

DOT Spec: stainless steel/high purity aluminum cargo tanks and rail cars. UN Spec: HDPE drums. Contact FMC for specific details.

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

PROPER SHIPPING NAME: Hydrogen peroxide, aqueous solutions with not less than 20%, but not more than 60% hydrogen peroxide.

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) / INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA)

PROPER SHIPPING NAME: Hydrogen peroxide, aqueous solutions with not less than 20%, but not more than 40% hydrogen peroxide (*).

OTHER INFORMATION:

(*) Air regulations permit shipment of Hydrogen Peroxide (20 - 40%) in non-vented containers for Air Cargo Only aircraft, as well as for Passenger and Cargo aircraft. HOWEVER, all FMC Hydrogen Peroxide containers are vented and therefore, air shipments of FMC H_20_2 is not permitted. IATA air regulations state that venting of packages containing oxidizing substances is not permitted for air transport.

Protect from physical damage. Keep drums in upright position. Drums should not be stacked in transit. Do not store drum on wooden pallets.

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355, APPENDIX A):
Not listed

SECTION 311 HAZARD CATEGORIES (40 CFR 370):
Fire Hazard, Immediate (Acute) Health Hazard

SECTION 312 THRESHOLD PLANNING QUANTITY (40 CFR 370):
The Threshold Planning Quantity (TPQ) for this product, if treated as a mixture, is 10,000 lbs; however, this product contains the following ingredients with a TPQ of less than 10,000 lbs.: None, (conc. <52%)

SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372):
Not listed

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)

CERCLA DESIGNATION & REPORTABLE QUANTITIES (RQ) (40 CFR 302.4):
Unlisted (Hydrogen Peroxide 20-40%); RQ = 100 lbs.; Ignitability, Corrosivity

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA INVENTORY STATUS (40 CFR 710):
Listed

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)
RCRA IDENTIFICATION OF HAZARDOUS WASTE (40 CFR 261):
Waste Number: D001, D002

CANADA

WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM):

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Hazard Classification / Division:	C E D2B
Product Identification Number:	2014
Ingredient Disclosure List:	Listed
Domestic Substance List:	All components listed

INTERNATIONAL LISTINGS

Hydrogen peroxide:

China: Listed
Japan (ENCS): (1)-419
Korea: KE-20204
Philippines (PICCS): Listed

HAZARD AND RISK PHRASE DESCRIPTIONS:

EC Symbols: O (Oxidizer)

	C	(Corrosive)
	Xn	(Harmful)
EC Risk Phrases:	R5	(Heating may cause an explosion.)
	R8	(Contact with combustible material may cause fire)
	R35	(Causes severe burns.)
	R20/22	(Harmful by inhalation and if swallowed.)

16. OTHER INFORMATION

HMIS

Health	3
Flammability	0
Physical Hazard	1
Personal Protection (PPE)	H

Protection = H (Safety goggles, gloves, apron, the use of a supplied air or SCBA respirator is required in lieu of a vapor cartridge respirator)

HMIS = Hazardous Materials Identification System

Degree of Hazard Code:
4 = Severe
3 = Serious
2 = Moderate
1 = Slight
0 = Minimal

NFPA

Health	3
Flammability	0
Reactivity	1
Special	OX

SPECIAL = OX (Oxidizer)

NFPA (National Fire Protection Association)

Degree of Hazard Code:
4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Insignificant

REVISION SUMMARY:
This MSDS replaces Revision #10, dated April 27, 2006.

Changes in information are as follows:
Section 1 (Product and Company Identification)
Section 3 (Composition / Information on Ingredients)
Section 15 (Regulatory Information)
Section 16 (Other Information)

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ATTACHMENT 4

ACCIDENTAL DISCHARGE, SLUG CONTROL PLAN

ACCIDENTAL DISCHARGE/SLUG CONTROL PLAN

GM POWERTRAIN - SAGINAW MALLEBLE IRON, SAGINAW, MICHIGAN
LNAPL RECOVERY SYSTEM

1.0 INTRODUCTION

This Accidental Discharge/Slug Control Plan will serve as spill prevention control and countermeasure plan for the LNAPL Recovery System, Saginaw Malleable Iron (SMI) Facility, located at 77 West Center, Saginaw, Michigan and it was prepared in accordance with the City of Saginaw Code of Ordinances, Title V, Chapter 51, Section 32.

The SMI plant ceased activities in April 2007. The former plant is scheduled for demolition. Currently the LNAPL Recovery System is inactive. Once plant demolition is completed, it is anticipated that the LNAPL Recovery system will run again.

2.0 DESCRIPTION OF LNAPL RECOVERY SYSTEM AND DISCHARGE PRACTICES

The LNAPL Recovery System treats groundwater from four recovery wells. Each recovery well has one scavenger LNAPL pump with an LNAPL/water level control and one groundwater pump. The scavenger pumps discharge directly to one of the two LNAPL totes that are located in the Treatment Building. The groundwater is pumped to a common line for all four wells in the Treatment Building. After the groundwater enters the common line, it is sent to an oil/water separator. The oil that is captured in the oil/water separator is pumped via an oil transfer pump to one of the two LNAPL totes in the Treatment building. The water from the oil/water separator is then pumped through an additional treatment system that includes hydrogen peroxide addition, a 10 micron bag filter, and a two unit Granular Activated Carbon (GAC) system that is used in series. The treated water is discharged to a 42 inch on-site sanitary sewer. The recovered LNAPL and spent carbon are disposed off-site.

3.0 DESCRIPTION OF STORED CHEMICALS

The LNALP Recovery System Treatment Building houses the chemicals/materials used for the system, these include hydrogen peroxide and GAC, also the recovered LNAPL. The hydrogen peroxide is loaded in the hydrogen peroxide feed system. The GAC is loaded in the primary and secondary GAC units during spent carbon changeouts. The recovered LNAPL is stored in two ECOBULK MX 220 Gallon collection totes (one additional tote is a spare).

4.0 ACCIDENTAL DISCHARGE NOTIFICATION PROCEDURES.

(1) In the case of any discharge, the LNAPL Recovery System Operation and Maintenance (O&M) contactor will immediately telephone and notify the City of Saginaw, Director of Public Works. The notification will include the location of discharge, type of waste, concentration and volume, and corrective actions taken. The telephone numbers

of the Director of Public Works of the City of Saginaw are 989-759-1523 and 989-759-1630.
(2) The O&M contractor will submit within five (5) days following the discharge a detailed written report describing the cause(s) of the discharge and the measures to be taken by to prevent similar future occurrences.
(3) A notice will be permanently posted on bulletin board of the LNAPL Recovery System Treatment Building advising employees whom to call in the event of a discharge. O&M contractor will ensure that the LNALP Recovery System operator is advised of the emergency notification procedure.

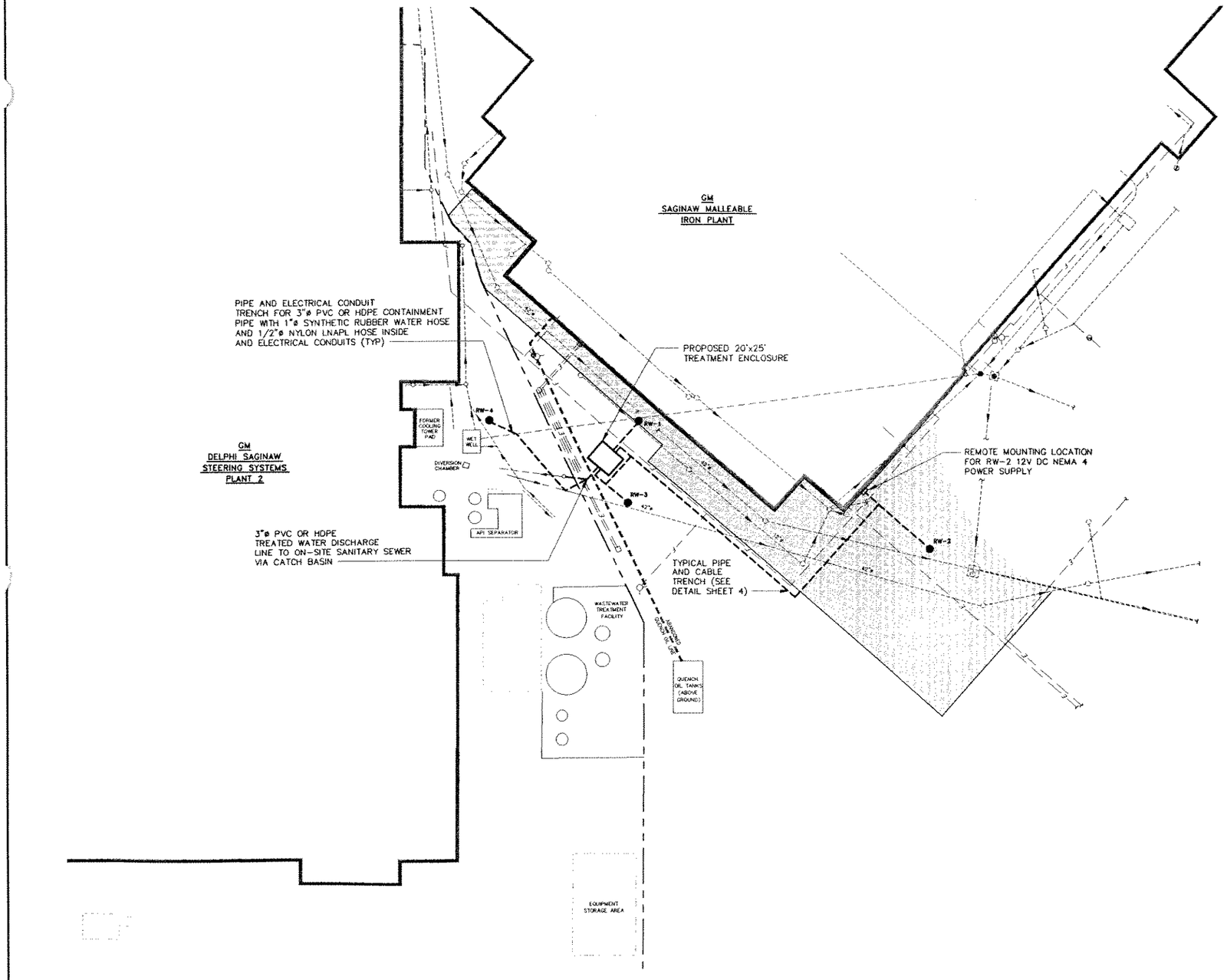
5.0 APPROACH AND PROCEDURES TO PREVENT ADVERSE IMPACT FROM ANY ACCIDENTAL OR SLUG DISCHARGE

In order to ensure the effectiveness of the LNALP Recovery System and to prevent any spill or leakage, the O&M contractor will conduct weekly inspections of the LNALP Recovery System to obtain operating data and to identify required maintenance activities. The inspections will include all components of the LNALP Recovery System and will consist of verification of structural integrity and proper operation per manufacturer's literature.

As training requirements, the LNALP Recovery System operator is required to complete a 40 hour health and safety training course (and annual refresher training) in accordance with 29 CFR 1910. The LNALP Recovery System O&M contractor is required to certify that all direct employees as well as the subcontractors have received the initial and annual medical examinations as required by 29 CFR 1910.

The LNALP Recovery System O&M contractor is responsible for on-site handling and coordination for off-site transport and disposal of the recovered LNAPL, spent carbon, and other waste generated during O&M activities.

In case of emergency LNALP Recovery System O&M contractor will apply the Emergency Response, Site Evacuation, and Spill and Release Contingency procedures as defined by the Site Specific Health and Safety Plan (HASP) that is kept on-site.



SITE PLAN

SCALE: 1"=50'

LEGEND:

- RW-2 ● RECOVERY WELL
- PIPE AND CABLE TRENCH
- EXISTING PAVED AREA
- PROPERTY LINE (APPROXIMATE)
- EXISTING SANITARY SEWER
- EXISTING ELECTRICAL
- EXISTING FIRE PROTECTION LINE

GENERAL NOTES:

1. THE CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION ACTIVITIES WITH REPRESENTATIVES OF GENERAL MOTORS CORPORATION (GMC) PRIOR TO COMMENCING ON-SITE ACTIVITIES.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD.
3. THE CONTRACTOR SHALL PROVIDE ALL LOCAL PERMITS AND MAKE ARRANGEMENTS FOR LOCAL INSPECTIONS (AS NECESSARY).
4. THE CONTRACTOR SHALL INSTALL EQUIPMENT IN NEAT AND WORKMANLIKE MANNER; ALIGN LEVEL AND ADJUST FOR SATISFACTORY OPERATION; INSTALL SO THAT PARTS ARE EASILY ACCESSIBLE FOR INSPECTION, OPERATION AND MAINTENANCE AND REPAIR, DEVIATION FROM INDICATED ARRANGEMENTS ARE SUBJECT TO REVIEW AND APPROVAL BY REPRESENTATIVES OF GMC PRIOR TO INSTALLATION AND/OR OPERATION.
5. THE CONTRACTOR SHALL FURNISH AND PLACE PROPER GUARDS FOR PREVENTION OF ACCIDENTS, PROVIDE ALL TRENCH SHORING, SCAFFOLDING, SHIELDING, DUST/FUME PROTECTION, MECHANICAL/ELECTRICAL PROTECTION, SPECIAL GROUNDING, SAFETY RAILINGS, BARRIERS, OR OTHER SAFETY FEATURES REQUIRED. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SUFFICIENT LIGHTS DURING NIGHT HOURS TO SECURE SUCH PROTECTION.
6. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THIS CONTRACT. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE SAFETY OF, AND SHALL PROVIDE THE NECESSARY PROTECTION TO PREVENT DAMAGE, INJURY, OR LOSS TO ALL EMPLOYEES ON THE WORK AND ANY OTHER PERSONS WHO MAY BE AFFECTED THEREBY.
7. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS, AND ORDERS OF PUBLIC BODIES HAVING JURISDICTION FOR THE SAFETY OF PERSONS OR PROPERTY OR TO PROTECT THEM FROM DAMAGE, INJURY, OR LOSS, INCLUDING, WITHOUT LIMITATION, THE DEPARTMENT OF LABOR SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION PROMULGATED UNDER THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 (PL 91-596) AND UNDER SECTION 107 OF THE CONTRACT WORK HOURS AND SAFETY STANDARDS ACT (PL 91-54) AND AMENDMENTS THERE TO. THE CONTRACTOR SHALL ERECT AND MAINTAIN, AS REQUIRED BY THE CONDITIONS AND THE PROGRESS OF THE WORK, ALL NECESSARY SAFEGUARDS FOR THE SAFETY AND PROTECTION AND SHALL COMPLY WITH ALL APPLICABLE RECOMMENDATIONS OF THE MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION OF THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC.
8. THE LOCATION OF UNDERGROUND UTILITIES AND OTHER UNDERGROUND STRUCTURES WERE OBTAINED BY FIELD MEASUREMENT WHERE POSSIBLE, OTHERWISE OBTAINED FROM OTHER SOURCES AND ARE APPROXIMATE ONLY. OTHER UNDERGROUND UTILITIES MAY EXIST, THE LOCATION OF WHICH AT THIS TIME ARE UNKNOWN. THE CONTRACTOR SHALL UNDERTAKE MEASURES TO LOCATE UTILITIES, KNOWN AND UNKNOWN, IN THE FIELD PRIOR TO INITIATING WORK UNDER THIS CONTRACT.
9. ALL SURFACES DAMAGED OR DESTROYED AS A RESULT OF WORK PERFORMED UNDER THIS CONTRACT SHALL BE RESTORED TO THEIR PRECONSTRUCTION CONDITION IN A TIMELY MANNER.
10. THE CONTRACTOR SHALL PLACE ALL SPOIL MATERIAL ON-SITE AT A LOCATION TO BE DETERMINED BY THE GMC REPRESENTATIVE.
11. THE CONTRACTOR SHALL REPAIR OR REPLACE ANY FENCING REMOVED OR DAMAGED DURING CONSTRUCTION.
12. ALL ELECTRICAL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST REVISION OF NFPA-70, NATIONAL ELECTRICAL CODE (NEC).
13. ALL ELECTRICAL EQUIPMENT SHALL BE U.L. LISTED AND LABLED.
14. ALL WORK SHALL CONFORM TO ALL APPLICABLE RULES, REGULATIONS AND CODES, INCLUDING BUT NOT LIMITED TO, MICHIGAN STATE BUILDING CODE, AND LOCAL HEALTH DEPARTMENT REGULATIONS.
15. THE CONTRACTOR SHALL NOTIFY THE GMC REPRESENTATIVE IMMEDIATELY WHEN CONFLICTS BETWEEN DRAWINGS AND ACTUAL CONDITIONS ARE DISCOVERED.
16. BASE MAP SUPPLIED BY AIR-LAND SURVEYS, INC. PHOTO DATED 11/90, PHOTOGRAMMETRIC MAPPING DATED 10/91.
17. SEWER INFORMATION FROM SPICER ENGINEERING COMPANY DRAWING NO. 15499-P, 1995 AND LOCATIONS ARE APPROXIMATE.

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.
BLASLAND, BOUCK & LEE, INC.

(RECORD DRAWING: MADE FROM DRAWING NO.1 FILE NO. 480.39.01F, DATED 6/98) DATE_____BY_____

X: 48039X01.DWG
L: ON=*, OFF=REF
P: CONT-DJD/CONT-MVB
6/00 SYR-54-RJM DCC
48039001/RECORD/48039C01.DWG

Graphic Scale
50' 0 50' 100'
1"=50'

No.	Date	Revisions	Init

Project Mgr. _____
Designed by _____
Drawn by _____
Checked by _____
Prof. Eng. _____
PE License _____

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

GENERAL MOTORS CORPORATION • SAGINAW MICHIGAN
LNAPL RECOVERY SYSTEM
SITE PLAN
GENERAL

File Number
480.39.10F
Date
JUNE 2000

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

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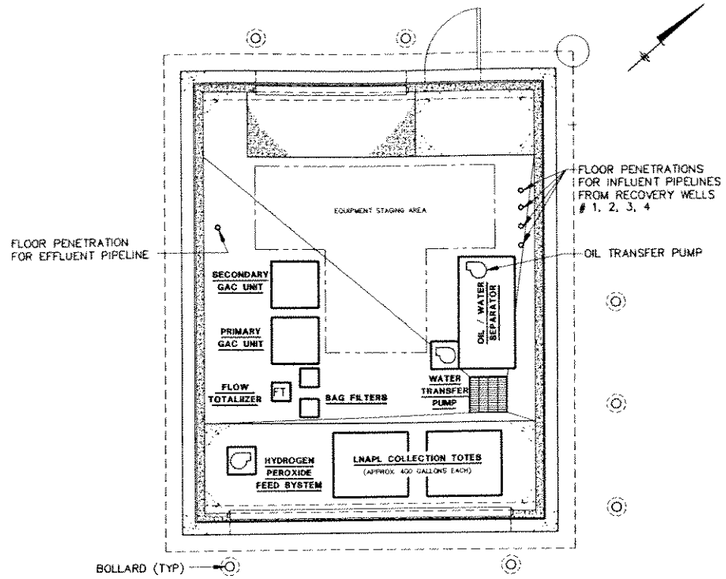
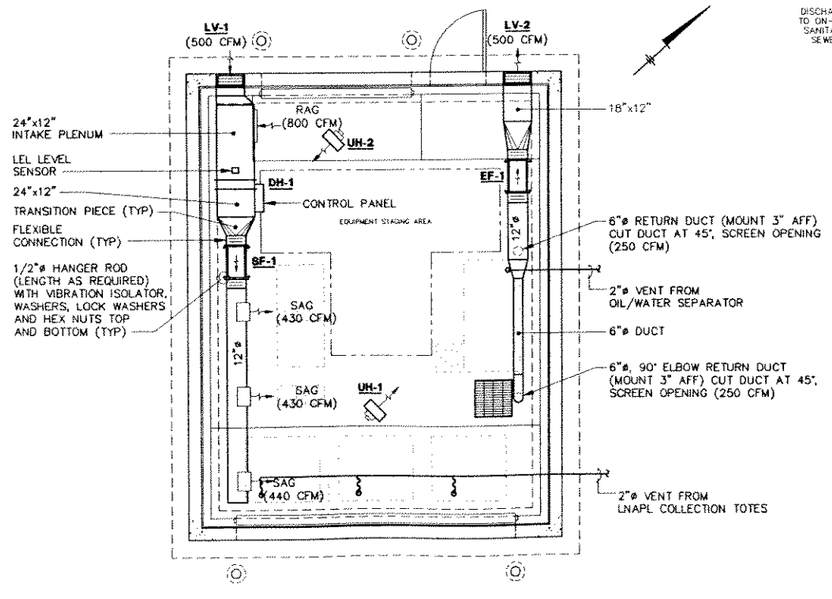


EQUIPMENT PLAN

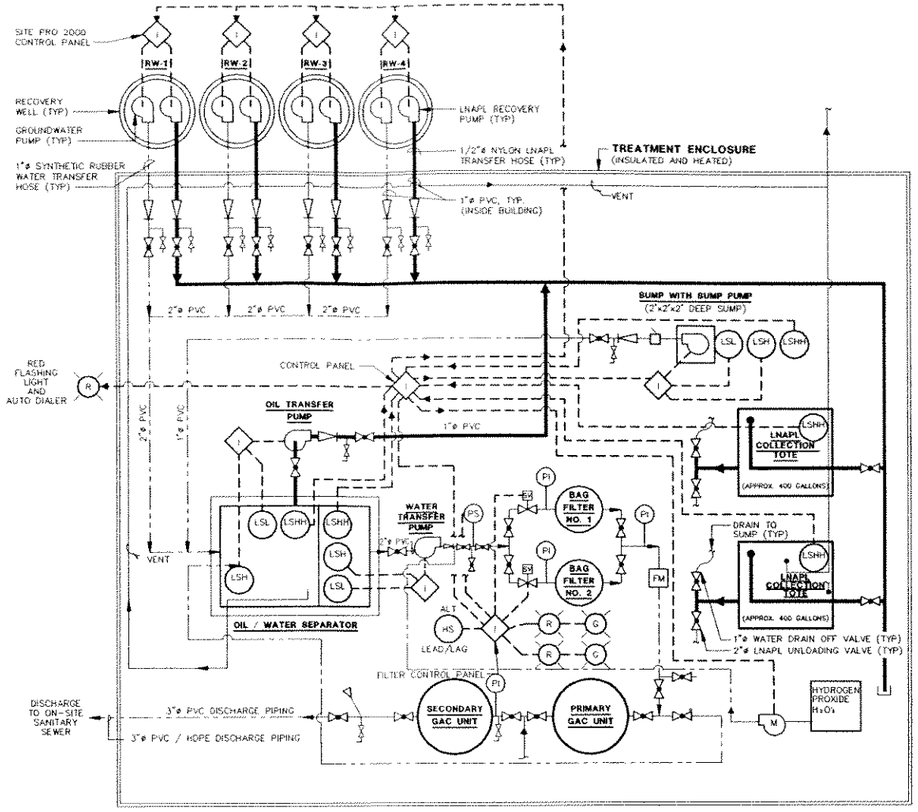
SCALE: 1/4"=1'-0"



MECHANICAL PLAN

SCALE: 1/4"=1'-0"

L: ON=•, OFF=REF
P: CONT-DJD/CONT-MVB
6/00 SYR-54-RJM DCC
480.39001/RECORD/480.39M01.DWG



PROCESS AND INSTRUMENTATION DIAGRAM

NOT TO SCALE

LEGEND

- LNAPL PIPING
- WATER PIPING
- INSTRUMENTATION WIRING
- SOLENOID VALVE
- BALL VALVE
- CHECK VALVE
- SAMPLE TAP
- VACUUM BREAKER
- (PI) PRESSURE INDICATOR
- (PS) PRESSURE SWITCH
- FM FLOWMETER
- PUMP
- Y STRAINER
- CAP
- (M) METERING PUMP
- (LSH) LEVEL SWITCH H = HIGH (PUMP ON), L = LOW (PUMP OFF) HH= HIGH HIGH (ALARM CONDITION)
- (HS) HAND SWITCH
- (↕) EITHER INPUT WILL ACTIVATE OPERATION
- (R) INDICATOR LIGHT R = RED LIGHT G = GREEN LIGHT
- GAC GRANULAR ACTIVATED CARBON
- LNAPL LIGHT NON-AQUEOUS PHASE LIQUID
- ALT ALTERNATOR
- LV-1 LOUVER
- DH-1 DUCT HEATER
- SF-1 SUPPLY FAN
- UH-1 UNIT HEATER
- EF-1 EXHUAST FAN
- SAG SUPPLY AIR GRILL
- RAG RETURN AIR GRILL

PROCESS EQUIPMENT SPECIFICATIONS:

1. LNAPL RECOVERY PUMPS TO BE TO BE ORS ENVIRONMENTAL SYSTEMS SMALL DIAMETER FILTER SCAVENGER WITH 60 MESH OLEOPHILIC / HYDROPHOBIC SCREEN WITH THE FOLLOWING INTERGRAL GROUNDWATER PUMPS:
   - FOR RW-1 GRUNDFOS MODEL 10E-5, 1/3 H.P., 230V, 1ø
   - FOR RW-2 GRUNDFOS MODEL 10E-5, 1/3 H.P., 230V, 1ø
   - FOR RW-3 GRUNDFOS MODEL 5E-5, 1/3 H.P., 230V, 1ø
   - FOR RW-4 GRUNDFOS MODEL 5E-5, 1/3 H.P., 230V, 1ø
2. WELL PUMP CONTROLLER TO BE ORS ENVIRONMENTAL SYSTEMS SITE PRO.®
3. OIL WATER SEPARATOR TO BE AFL INDUSTRIES MODEL VTC 20A WITH LNAPL TRANSFER PUMP CAPABLE OF 10 GPM AT 15 FT. TDH AND WATER TRANSFER PUMP CAPABLE OF 20 GPM AT 50 FEET TDH OR EQUAL. BOTH PUMPS TO BE EXPLOSION PROOF.
4. BAG FILTER UNITS TO BE FILTER SPECIALIST, INC. MODEL FSP-35 WITH CARBON STEEL BODY, STAINLESS STEEL BASKET, VITON SEALS AND 10 MICRON POLYESTER FELT FILTER BAGS.
5. GRANULAR ACTIVATED CARBON (GAC) UNITS TO BE ADVANCED RECOVERY TECHNOLOGIES CORPORATION, MODEL GREENLINE 22 WITH 600 LBS. OF 8 x 30 MESH CARBON PER UNIT.
6. ALL PVC PIPES TO BE SCHEDULE 80 TYPE II UNLESS OTHERWISE SPECIFIED.
7. ALL HDPE PIPE TO BE SDR-17, PLEXCO PE 3408 OR EQUAL.
8. FLOW METER TO BE BADGER METER, INC. INDUSTRIAL RCDL FLOWMETER MODEL M70 WITH 1"ø NPT END CONNECTIONS, VITON O-RING AND BRASS HOUSING OR EQUAL.
9. ALL BALL VALVES TO BE PVC TRUE UNION TYPE WITH VITON SEALS BY TRUE BLUE OR EQUAL.
10. ALL BALL CHECK VALVES TO BE PVC, TRUE UNION TYPE WITH VITON SEALS BY PLASTO-MATIC OR EQUAL.
11. ALL PRESSURE GAUGES TO BE TRERICE MODEL NO. D831 GLYCERINE-FILLED OR EQUAL, WITH 0-30 psi DIAL RANGE.
12. SUMP PUMP TO BE VERTICAL CENTRIFUGAL SUMP PUMP, McMASTER-CARR ITEM NO. 4323K21 (1/3 HP, 115V, SINGLE PHASE) WITH EXPLOSION PROOF MOTOR CAPABLE OF 35 GPM @ 15 FT. TDH OR EQUAL.
13. PRESSURE SWITCH TO BE 1-30 PSI, WITH TEFLON DIAPHRAGM, INCLUDE MANUAL RESET OPTION SINGLE POLE, DOUBLE THROW (SPDT) RATED FOR 5 AMPS AT 120 VOLTS OR EQUAL.
14. SOLENOID VALVES TO BE ASCO RED-HAT, 2-WAY PILOT OPERATED GENERAL SERVICE STAINLESS STEEL SOLENOID VALVES WITH TEFLON SEATING. VALVES TO BE 2" DIAMETER NORMALLY CLOSED (CLOSED WHEN DE-ENERGIZED).
15. THE PRESSURE SWITCH AND SOLENOID VALVES TO BE MOUNTED AT LEAST 3-FEET ABOVE FINISHED FLOOR.

HEATING AND VENTILATING EQUIPMENT SPECIFICATIONS:

1. LOUVERS (LV-1 AND LV-2)

LOUVER (LV-1)

A. INTAKE LOUVER TO BE ARROW UNITED MODEL EA-681-P, 18" WIDE X 24" HIGH.
B. ALUMINUM, COMBINATION TYPE WITH 35° BLADES MANUAL LOCKING QUADRANT MANUAL OPERATION.
C. 500 CFM AT 438 FPM FREE AREA VELOCITY WITH A PRESSURE DROP OF 0.026" W.C.

LOUVER (LV-2)

A. EXHAUST LOUVER TO BE ARROW UNITED MODEL 265 18" WIDE X 12" HIGH.
B. ALUMINUM, FIXED WITH 35° DRAINABLE BLADES.
C. 500 CFM AT 1086 FPM FREE AREA VELOCITY WITH A PRESSURE DROP OF 0.10" W.C.

2. UNIT HEATERS (UH-1 AND UH-2)

A. UNIT HEATER TO BE CHROMALOX MODEL LUH-10-43 OR EQUAL.
B. HEATER SHALL BE 10 KW, 480 V, 3ø .
C. PROVIDE WITH INTEGRAL THERMOSTAT AND HANGER KIT.

3. DUCT HEATER (DH-1)

A. DUCT HEATER TO BE INDECO OR EQUAL.
B. UNIT TO BE 30 KW, 24" WIDE X 12" HIGH 480 V, 3ø, 2 STAGE, WITH 122 VOLT CONTROLS.
C. UNIT TO HAVE 2 STAGE SCR CONTROL WITH DUCT THERMOSTAT AND AIR FLOW SWITCH.

4. DUCT AXIAL FANS (SUPPLY FAN SF-1)

A. FAN TO BE HARTZELL SERIES 47 MODEL NO. 47-12-DVA3F-C OR EQUAL.
B. SUPPLY 1300 CFM AT 1/4" W.C., 1/2 HP MOTOR 120 V, 1ø .
C. PROVIDE BELT GUARD AND MOUNTING FEET.

5. EXHAUST FAN (EF-1)

A. FAN TO BE HARTZELL SERIES 47 MODEL NO. 47-12-DVA3E-C OR EQUAL.
B. EXHAUST 500 CFM AT 1/4" W.C., 1/3 HP EXPLOSION PROOF MOTOR 120 V, 1ø .
C. PROVIDE BELT GUARD AND MOUNTING FEET.
D. TYPE B SPARK RESISTANT CONSTRUCTION.

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.
BLASLAND, BOUCK & LEE, INC.

(RECORD DRAWING: MADE FROM DRAWING NO. 2 FILE NO. 480.39.02F, DATED 6/96) DATE_____BY_____

Graphic Scale 1/4"=1'-0" (4' 2' 0 4' 8')

No.	Date	Revisions	Init

Project Mgr. _____
Designed by _____
Drawn by _____
Checked by _____
Prof. Eng. _____
PE License _____

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

GENERAL MOTORS CORPORATION • SAGINAW MICHIGAN
LNAPL RECOVERY SYSTEM

PLANS AND DIAGRAM

MECHANICAL

File Number 480.39.11F
Date OCTOBER 1998

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