

SECTION E

ENVIRONMENTAL MONITORING PROGRAMS

R 299.9611

**ENVIRONMENTAL MONITORING PROGRAMS
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TABLES

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APPENDICES

Appendices E-1 and E-4 listed below and referenced in this section are found in the Appendices Tab of this application. Appendices E-2 and E-3 are provided on the Hydrogeological Data CD included with this application

Appendix E-1: Air Monitoring Report

Appendix E-2: Groundwater Evaluation Reports

Appendix E-3: Groundwater Not in an Aquifer Determination

Appendix E-4: Waiver of Groundwater Monitoring Requirements

This application Attachment addresses requirements for an environmental monitoring program for hazardous waste management units and the hazardous waste management facility for the EQ Detroit (EQD) facility. The attachment includes either a monitoring program description or a demonstration for a waiver from the monitoring requirements in accordance with R 299.9611(3)(a) and (b) and R299.9611(14) as indicated below:

E-1 General Information

EQD occupies approximately 15 acres, approximately 45% of the property is currently covered by buildings or concrete. The facility is located within a commercial and industrial area in the City of Detroit.

Surface materials at EQD consist of sand and fill, which extends to a depth of 4 to 5 feet. Local geology consists of unconsolidated glacially derived silty clays that may extend to more than 100 feet in depth. There may be sand and/or silt units possessing varying permeabilities interspersed with the clay. The regional topography is fairly level, with a relief of approximately 5 feet over the site. The site elevation is approximately 630 feet above mean sea level (MSL), and the site slopes gently towards the northwest.

There are no lakes, streams or wetlands on the property. Surface water runoff either flows to the containment area, the City of Detroit Sewer system or off-site. See **Sheet A-0 Topographic Map**. The collection system topography is fairly level, with a relief of approximately 5 feet over the site. Any contaminated stormwater is treated prior to discharge to the Great Lakes Water Authority (GLWA).

Environmental investigations conducted at the site did not detect the presence of groundwater or soil contamination. Depth to shallow groundwater in this area is approximately 40 feet below grade and may flow in a south-southwest direction. There are no known groundwater users located within one mile of the EQD facility. Drinking water in this area is supplied by the City of Detroit, and there are no potable water wells located on the property.

Normal maximum temperatures are 80°F in July, and normal minimum temperatures are 20° in January. Normal annual precipitation is approximately 28 inches. Winds are predominately from the north. It is anticipated that an air emission would travel southward, although the actual path of migration would vary with prevailing winds. The yearly average wind speed is approximately 10 miles per hour.

E-2 Ambient air Monitoring Program

(R 299.9611(2)(c) and (4))

The Ambient Air Monitoring Program for the EQD facility was designed to meet the requirements of Michigan Act 451 R 299.9611.

E-2a Subparts AA and BB

(R 299.9504(12-13), R 299.9630, R 299.9631, 40 CFR 270.34 and 280.25)

The requirements of Subparts AA and BB are not applicable to the EQD facility, since the emissions at this facility are fugitive. The maximum Volatile Organic Compounds

(VOCs) emissions are less than 2 tons/year. Also the facility is not a significant source of Criteria Pollutants.

E-2b Subpart CC

(40 CFR 270.16(k))

EQD does not operate a subpart CC waste treatment system at the facility. The facility currently accepts subpart CC waste for shipment to appropriate permitted facilities.

E-2c Ambient Air Monitoring Program

In accordance with the Michigan Department of Environmental Quality (MDEQ) Waste Management and Radiological Protection Division (WMRPD) Part 111, ambient air monitoring will be conducted as a requirement of this permit. The ambient air quality will be monitored at three stations based upon the location of the facility (heavy industrial area) and the prevailing wind direction from the west. These locations are noted on the **Sheet R-3**. The ambient air monitoring program described will be used to characterize the air quality associated with EQD. All three sites are monitored for Total Suspended Particulate (TSP) using a filter-based high volume sampler, metals (lead, cadmium, chromium and zinc) and Volatile Organic Compounds (VOCs) using a sorbent tube sampler. The sampling for all parameters will be conducted in accordance with the methods specified by the United States Environmental Protection Agency (USEPA) in 40 CFR parts 50, 53, 58 and the Toxic Organic Compendium Method, TO-17 for solid sorbent tubes. The sampling will be conducted on the prescribed sample days as determined by the EPA.

E-2c(i) Sampling

Metal concentrations will be determined from the samples collected in a reference method high volume TSP sampler. The sampling for multi-metals will adhere to the requirements of 40 CFR Part 50, Appendix G for the determination of lead. All sections referenced by Part 50, Appendix G will likewise be followed. The analysis will be performed using the EPA Reference Methods for lead and the other metals listed in **Table E-1** attached to this section. Quality Control and Quality Assurance requirements specified in the method will be incorporated in the sampling protocol. Samples will be collected once per month for a twenty-four (24) hour period with a nominal flow rate of 50 cfm \pm 10 cfm.

VOCs will be sampled utilizing a system of sorbent tubes capable of effectively collecting the listed compounds (**Table E-2**). A constant flow sampling pump is operated at approximately 0.10 liters/min. Samples will be collected at a flow rate adequate to reach the required limits of detection. Sampling will be conducted in adherence to the EPA's Toxic Organic Compendium Method, TO-17 for solid sorbent tubes. Sampling will be conducted once a month.

E-2c(ii) Quality Assurance

On each run day, samples from the co-located site shall be analyzed and reported to the MDEQ for the assessment of sampler precision. One sample day per month, one

blank (not have air pulled through it) sorbent tube and metals filter shall accompany the samples to the co-located site and submitted to the laboratory as trip “blanks”. All laboratory quality assurance, such as the analysis of blanks and standards shall be made available to the MDEQ upon request for the determination of accuracy. If any parameter that is analyzed by the laboratory and determined to be non-detectable, the value of the method detection limit for that compound divided by two (MDL/2) shall be reported. Staff from the MDEQ may audit the ambient air monitoring program, files, and samplers at their discretion.

E-2c(iii) Reporting

Within 60 days after the end of the month in which it was collected, all ambient air monitoring data will be reported in an acceptable electronic format to the MDEQ. The facility will keep copies of all ambient air data on-site as part of the Operating Records. A request can be made to the Chief of the WMRPD to modify the monitoring plan if one year of sampling events show non-detectable levels of that parameter. The determination to alter the ambient air monitoring plan shall be made by staff from both the WMRPD and the AQD. The final approval letter regarding any changes to the ambient air monitoring plan will be issued by the WMRPD.

E-3 Soil Monitoring Program

R 299.9611(2)(d)

All active portions of the EQD facility are paved with asphalt or concrete thereby eliminating the potential pathway for migration to site soils. Therefore, the 2003 Part 111 permit waived the requirement for soil monitoring requirements and EQD will not implement a soil monitoring plan.

E-4 Groundwater Monitoring Program

(R 299.9611(2)(b), R 299.9612 and 40 CFR 270.14(c)5)

The Michigan DEQ by issuance of the 2003 Operating License to the Part 111 permit without groundwater monitoring requirements waived the requirements for a groundwater monitoring program. The Operating license and the MDEQ acceptance of the 2003 operating license conditions are found in **Appendix E-4**. The information provided below was included in the 2003 permit application. The Hydrogeological Evaluation (Appendix E-2 and E-3) discussed below is provided on a CD included with this Permit Application.

E-4a Hydrogeological Investigation Summary

A preliminary assessment of the hydrogeological and geochemical conditions at the site has been addressed in a report titled “Hydrogeologic Evaluation” prepared by GZA GeoEnvironmental, Inc, February 1991. Subsequent activities included the performance of groundwater sampling and analysis; the results are documented in reports titled: Groundwater Evaluation: A copy of the latest round of groundwater sampling and analysis report (March 1999) is included as **Appendix E-2**, along with the above mentioned GZA report.

E-4a(i) Site Geology

Although neither the surficial nor the bedrock geology of the EQD site have been mapped in detail, the site has been included on a general surficial geology map made by Farrand¹ and on the bedrock maps prepared by Mozola² and Western Michigan University³. The findings made during a previous (GZA) explorations study phase were in agreement with these reported conditions. The following provides a description of the geologic setting underlying the site based on conditions encountered during recent subsurface explorations and on the literature reviewed:

Near- Surface Fills The near surface soils at the site consist mainly of disturbed sand fill with intermittent clay layers and urban rubble, to include demolition debris. These fill soils range in thickness from 7 to 9 feet. Perched groundwater was only encountered in the fill soils and is considered to be localized and limited in extent.

Clays Silty clay material was found below the near-surface fills. The material contained variable amounts of sand and gravel and was continuous to a depth of about 32 to 36 feet. The silty clay strata ranged in consistency from medium stiff to hard and is typically referred to as lacustrine clay.

According to previous studies made by GZA GeoEnvironmental, Inc., test borings were advanced through the clays to a depth of more than 50 feet below the lowermost sand lens. Based on a literature review, it is anticipated that these or similar clayey soils continue to depths of about 150 to 200 feet below the site.

The site reportedly lies above the Dundee Limestone and Traverse Group formations which form the bedrock surface. Geologic maps indicate the bedrock surface boundary between these formations runs at or near the site.

The Traverse Group is a thick, 100 to 800 foot sequence of alternating shales, limestones, and dolomite. The shales in this group are not considered water-bearing aquifers; however the limestone units may supply large volumes of water locally. Shales in the Traverse Group serve as excellent confining layers, having low effective porosity. The limestone units are relatively impermeable, but have local porous zones, particularly at the surface of the formation.

The Dundee Limestone formation is a fossiliferous limestone that is locally dolomitized. It ranges from about 50 to more than 350 feet thick in the eastern portion of Michigan's lower peninsula. Although the Dundee has a relatively low effective porosity, "selective" porous and permeable zones associated with fractures and bedding planes are considered water-bearing aquifers. Because of the presence of these fractures, the Dundee is limited as a confining layer.

E-4a(ii) Site Hydrology

A review of the Detroit Department of Health and U.S. Environmental Protection Agency (EPA) Underground Injection Well Control Program revealed no domestic, municipal, industrial, oil, gas, or injection wells within a one mile radius of the site. The following Sections concentrate on the climactic conditions, surface water and groundwater flow regimes identified specifically for the EQD site.

Surface Water-Hydrology

Surface water run-off of the site area is controlled by the storm sewers owned and operated by the City of Detroit.

Review of the Federal Emergency Management Agency, national Flood Insurance Program, shows that the Detroit River, located approximately 2.7 miles south of the site to be the closest potential flood risk in the surrounding area. Based on this mapping, EAD lies within a Zone C area, and is not considered subject to flooding.

Site and Regional-Hydrology

Domestic water for the entire City of Detroit and portions of the surrounding locale are supplied by the Great Lakes. Supplies of groundwater of usable quantities near the site may be found within the deep alluvial deposits or in the underlying bedrock. Although the alluvial deposits do not appear to be continuous over long distances, their contact surface with the surrounding saturated soils may be of sufficient area to generate large quantities of water locally.

Groundwater from the lacustrine clays underlying the site are not considered usable as a source of water because of the inability of the clays to transmit significant amounts of water (i.e. very low permeability).

Based on review of published literature and on the observations made during the subsurface exploration program, it does not appear that any local groundwater resources will be developed within the immediate site area.

Groundwater flow in the site area will be toward the Detroit River and adjacent lakes. As described by Mozzola, groundwater will occur under both water table and semi-confined to confined conditions, constituting a complex single system, rather than totally independent flow regimes.

E-4a(iii) Hydrogeological Characteristics

An analysis of hydrogeological conditions included those soil layers within 30 feet of ground surface, subsequently labeled as the "upper aquifer", and a second subsurface previous zone at a depth of approximately 40 to 60 feet below ground surface, referred to as the "lower aquifer". This approach is due to the complex geologic nature of the

soil and bedrock conditions underlying the EQD site and the generally continuous clay soils reported and observed below a depth of about 40 to 60 feet.

The more previous sand seams in these layers will largely control groundwater movement at the site. These zones are separated by what appears to be a continuous layer of clay soil that will act to retard groundwater movement between the two zones. The following Subsections address specific hydraulic characteristics of the soil layers explored during GZA's study. Of particular interest are the soils hydraulic conductivity, hydraulic gradient, porosity, and groundwater transport velocity.

Hydraulic Conductivity The hydraulic conductivity ("permeability") of a soil mass is a measure of the rate at which water ("fluid") flows through the soil. As GZA noted in its report, a total of 15 field and 18 laboratory permeability tests were performed to establish representative values of the individual layer permeabilities. These values may be summarized as follows:

"Upper Aquifer"	10^{-7} cm/sec
"Intermediate Clay Layer"	10^{-8} cm/sec
"Lower Aquifer"	10^{-5} to 10^{-6} cm/sec
"Underlying Clay Layer"	10^{-8} cm/sec

As indicated, the permeabilities measured are considered as relatively low. Additionally, no distinction between the horizontal and vertical permeability is shown because variations, even on the order of one magnitude will not significantly affect groundwater transport velocities described in the GZA Report.

Hydraulic Gradient & Flow Direction Based on past and recent evaluations, groundwater flow direction interpreted for both the "upper and lower aquifers" appears to be consistent with the published area data. A general easterly flow direction appears to coincide with the axis of the deep bedrock valley and thick glacial deposits reported for the immediate site vicinity.

In summary, previous groundwater studies (**Appendix E-2**) documented that the EQD site is:

Underlain by silty clay soils to depths of more than 100 feet. The clay soils are characterized by a very low hydraulic conductivity;

Underlain by groundwater of quality that is consistent with background levels for the geographic area;

Not located within a mile radius of identified groundwater users or potential users;

Based on the geologic and hydrogeological conditions encountered, and the fact that no groundwater users (or potential users) are present in the surrounding areas, it appears that EQD is a favorable location for waste treatment operations.

E-4b Groundwater Monitoring Program Waiver

The hydrogeological investigation summarized above, identified groundwater in the “upper” and “lower” aquifer units at the facility. These units consist of low permeable soils with low groundwater yield. The technical basis for this determination is provided in **Appendix E-3**. Documents supporting the waiver of groundwater monitoring requirements is found in **Appendix E-4**; as a result, EQD will not institute a groundwater monitoring plan.

E-5 Other Environmental Monitoring Programs

(R 299.9611(5))

Additional environmental monitoring requirements may include sewer effluent monitoring. EQD discharges treated wastewater resulting from several of its treatment processes into the combined GLWA sanitary/sewerage system. EQD has instituted an effluent monitoring program of the treated wastewater prior to discharge into the sewer. A continuous 24-hr composite sample is collected on a flow-proportional basis from the facility’s effluent stream and submitted for chemical analysis to ensure compliance with the regulatory requirements of the GLWA. Should any sudden, unplanned discharge to sewers occur, the facility will notify the GLWA in accordance with the provisions established in Environmental Safeguard and Engineering Descriptions. A copy of the EQD Wastewater Discharge Permit is found in **Appendix A-4**

A review of the Federal Emergency Management Agency, National Flood Insurance Program, shows the nearest surface water body is the Detroit River, located approximately 2.7 miles to the east of the site, to be the closest potential flood risk. Based on this mapping, EQD lies within a Zone C area and is not considered subject to flooding.

Surface water run-off at the site and surrounding areas is controlled and maintained by Great Lakes Water Authority. Therefore, EQD will not institute a surface water monitoring program.

E-6 Corrective Action

(R 299.9504(1)(c) and 508(1)(b) and 40 CFR 270.14(d)(1)(i-v) and (d)(2))

Facilities such as EQD, 1923 Frederick Street, Detroit, MI, seeking a permit are required to provide the following information for each solid waste management unit:

The location of each waste management unit at the facility is provided on the Facility Drawing **Sheet A-3**.

The designation, dimensions and structural description of each waste management unit at the facility are discussed in **Section D**. Also, refer to **Tables D-1 and D-2** and the Site Drawings.

The 1923 Frederick Street facility has been in existence and operating as a RCRA Storage facility for approximately 27 years. The Frederick Street facility received regulatory authorization to operate as a hazardous waste facility on September 25, 1990.

No records of any releases are available, except for the discovery of a release in 1989 during removal of 2 X 10,000 gallon USTs (gasoline and diesel). All work was completed in accordance with Act 423 of 1984 as amended by Act 151, 1989. Verification samples were collected by GZA, and a Closure Report was submitted to MDEQ by GZA in 1989.

1 Farrand, W.R., Quaternary Geology of Michigan. State of Michigan Department of Natural Resources, Geological Survey, 1982.

2 Mozola, Andrew J., Geology for Land and Groundwater Development in Wayne County, Michigan. State of Michigan Department of Natural Resources Geological Survey Report No. 3, 1969.

3 Western Michigan University, Hydrogeology for Underground Injection Control in Michigan. Department of Geology, 1981.

Table E- 1: Ambient Air Monitoring Parameters: Metals

Table E- 2: Ambient Air Monitoring Parameters: Organic Compounds

Appendix E-1: Air Monitoring Report

Appendix E-2: Groundwater Evaluation Reports

Groundwater Evaluation Report 21st Century Resources, March 1999.

Hydrogeologic Evaluation, GZA GeoEnvironmental Inc., February 1991

Appendix E-2 is provided on a CD included with this Permit Application

Appendix E-3: Groundwater Not in an Aquifer Determination

Appendix E-3 is provided on a CD included with this Permit Application

Appendix E-4: Waiver of Groundwater Monitoring Requirements