

Revitalizing Auto Communities Environmental Response
Trust (RACER)

Vapor Intrusion Conceptual Site Model

Pontiac North Campus – Former Fiero Plant

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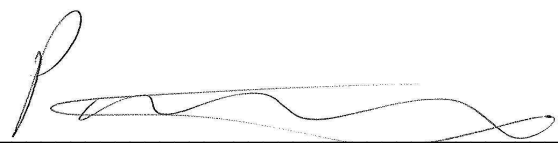
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Acronyms and Abbreviations

AOI	Area of Interest
bgs	below ground surface
cVOC	chlorinated volatile organic compound
CSM	Conceptual Site Model
CCR	Current Conditions Report
EGLE	Michigan Department of Environment, Great Lakes, and Energy
Ft	feet
ft/ft	foot per foot
GMC	General Motors Corporation
GSI	groundwater surface water interface
HPT	Hydraulic Profiling Tool
MDEQ	Michigan Department of Environmental Quality
MDNR	Michigan Department of Natural Resources
MLC	Motors Liquidation Company
PCE	Tetrachloroethylene
PNC	Pontiac North Campus
RACER	Revitalizing Auto Communities Environmental Response Trust
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SSVIAC	Site-Specific Volatilization to Indoor Air Criteria
SVMP	Soil vapor monitoring point
TCE	Trichloroethylene
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VI	Vapor Intrusion
VOC	Volatile organic compound

1 Introduction

Arcadis of Michigan, LLC (Arcadis) has prepared this Conceptual Site Model (CSM) report, which summarizes the potential exposure pathways and nature and extent of contamination at the former Fiero portion of the Pontiac North Campus (PNC) properties (Site), on behalf of Revitalizing Auto Communities Environmental Response Trust (RACER). Specifically, this report summarizes soil and groundwater data with respect to the recent chlorinated volatile organic compounds (cVOCs) vapor intrusion (VI) criteria exceedances near the southwestern boundary of the Fiero property. The Site layout is presented on **Figure 1**.

1.1 Site Operations

On June 1, 2009, General Motors Corporation (GMC) filed for Chapter 11 protection under the U.S. bankruptcy code. On July 10, 2009, GMC was renamed Motors Liquidation Company (MLC), and on the same day, some of the operating assets of GMC, including a portion of PNC, were sold to a newly formed company named “General Motors Company.” General Motors Company changed its name to General Motors LLC (GM LLC) on October 16, 2009. Assets not sold to GM LLC remained the property of MLC in its capacity as debtor-in-possession in the bankruptcy case. Effective March 31, 2011, Revitalizing Auto Communities Environmental Response Trust (RACER) was created through a Bankruptcy Settlement Agreement among MLC, the federal government, 14 states, and the St. Regis Mohawk Tribe. Ownership of MLC properties was transferred to RACER, and RACER assumed responsibility for remediating those properties including a portion of PNC.

1.1.1 Historical Site Operations

Historical references indicate the former Fiero Assembly and Fiero Powerhouse properties were developed in the 1920s-1930s. The former Fiero Assembly property was originally constructed as an automobile finishing and assembly plant manufacturing auto bodies for Oakland Motor Cars operated under the Fisher Body Corporation Division of the former General Motors Corporation (GMC). Historical references indicate the presence of steel storage and fabrication operations; trim shop operations; lacquer mixing, spraying and drying operations; printing and upholstering operations, and woodworking and assembly operations. These operations continued through the late 1970s, when the facility was retooled to manufacture and assemble Fiero vehicles, which occurred for an approximate 10-year period from 1980 through 1990. From the time GMC ceased manufacturing Fiero models and decommissioned assembly operations in the early 1990s until the late 2000s, the former Fiero Assembly building was used for prototyping, storage, and other non-manufacturing processes. While details pertaining to exact dates and potential sources of cVOCs were not documented and are unable to be confirmed, based on available literature, the use of chlorinated solvents could have spanned from after World War II up to approximately 1990. After MLC's (GMC's) bankruptcy and the sale of the Former Fiero Assembly Plant property, the majority of associated building structures were demolished in 2011 and 2012. RACER Trust decommissioned and demolished the entire Fiero Powerhouse facility in 2019 and 2020.

1.1.2 Current Site Operations

The Former Fiero Assembly property at the Site is currently owned and occupied by GFL, Inc. who operates a waste transfer facility. A waste transfer facility is a station where solid waste is dropped by smaller trucks, held, and sorted before being loaded onto larger trucks for proper disposal at a landfill. While certain activities are conducted inside remaining portions of the building structures, external areas are primarily used as a storage yard for dumpsters and roll-off waste containers, as well as bulk material stockpiling.

In addition, as of March 2021, GFL leases the former Powerhouse portion of the Site for additional storage during its planned redevelopment of the Former Fiero Assembly property.

1.2 Investigation History

The following exhibit lists the primary investigations completed to date at the Site:

Exhibit 1: List of Fiero Site Investigative Activities

Investigation/Report	Organization	Year	Description
Current Conditions Report (CCR)	GMC	2001	Summary of historical operations and current status of the PNC areas of concern.
RCRA Facility Investigation (RFI) Work Plan Pontiac North Campus Addendum #2	GMC	2001	Proposed investigation of Fiero areas of interest (AOI) F-7, F-8, and F-15.
RCRA Facility Investigation (RFI)	GMC	2002	Site-wide investigation to assess the environmental impacts present at the PNC Site.
Supplemental RFI #1	GMC	2003	Follow-up investigation to further investigate areas of interest (AOIs) identified in the original RFI.
RCRA Facility Investigation (RFI) Work Plan Pontiac North Campus Addendum #8	GMC	2003	Proposed investigation of Fiero AOIs F-7 and F-15.
Fiero Sewer and Subsurface Investigation	GMC	2004	An investigation to assess the subsurface utilities present on the Fiero property.
RFI Work Plan Addendum #25	GMC	2006	An investigation of the parking lot west of the Fiero plant at AOI F-17.
RACER Trust Annual Groundwater Monitoring Reports	RACER	2011 - 2020	Summary of the groundwater monitoring analytical results.

Investigation/Report	Organization	Year	Description
RACER Trust Working Draft RFI	RACER	2012	Summary of the site-wide investigation activities and results of the RFI.
RACER Trust Focused Corrective Measures Study, Fiero Assembly	RACER	2015	Summary to describe the proposed corrective measures for the former Fiero Assembly Site.
RACER Trust Draft Corrective Measures (CMI) Implementation Work Plan - Fiero	RACER	2015	Proposed implementation and execution of the selected corrective measures.
1,4-Dioxane Supplemental Investigation	RACER	2017	An investigation of the Fiero site utilizing high resolution tools and sampling to assess the potential off-site migration of 1,4-dioxane impacts in groundwater.
RACER Trust Fiero Well Locating Memo	RACER	2020	An investigation that involved searching and locating monitoring well locations on the Fiero properties.
RACER Trust Fiero Well Abandonment Memo	RACER	2020	Summary of the well abandonment activities on the Fiero properties.
Vapor Intrusion Investigation	RACER	2020 – 2021 (Ongoing)	An investigation that screened available soil data and groundwater data against vapor intrusion (VI) screening levels. In addition, new monitoring wells and soil vapor monitoring points were installed near the property boundary.

1.3 Source Areas

Based on historical investigations several areas of interest (AOIs) were identified and evaluated. These AOIs are listed as F-1, through F-17. Those AOIs that warranted further action following the CCR (ENCORE 2001) are illustrated in **Figure 2**. Soil analytical results from these AOIs can be found in **Table 1** and groundwater results from these AOIs can be found in **Table 2**. The CCR (ENCORE 2001) and the CCR Addendum (ENCORE 2002) identified 14 AOIs (F-1 through F-14) at the Site. Of the 14 AOIs, five AOIs (F-7, F-8, F-12, F-13, and F-14) at the Site required further action. Available information was sufficient to support No Further Action for the nine remaining AOIs. Three new AOIs (F-15, F-16, and F-17) were identified during the 2002 and supplemental 2003 RFI activities and further action was recommended for these AOIs. The current and historical AOIs are described in the exhibit below.

Exhibit 2: Summary of Former Fiero Areas of Interest

Area ID	AOI Description	Materials Managed	RFI/Interim Measures Activities
F-1	Powerhouse Satellite Accumulation Areas: Powerhouse basement	Managed waste paint thinner	No known releases reported and no visual evidence of a release observed. No further action was recommended in the CCR.
F-2	Waste Gasoline Accumulation Area: Maintenance area of the assembly building (Plant 17)	Managed waste gasoline	No known releases reported and no visual evidence of a release observed. No further action was recommended CCR.
F-3	Container Storage Area: Located on the south side of the storage dock of Plant 17	Storage of chlorinated solvents, paint waste, waste sealers, and waste adhesives	Closure report was submitted to MDNR in Jan. 1995. Final closure is being pursued through the RCRA Corrective Action process.
F-4	Closed Container Storage Area: Southwest driveway, adjacent to railroad tracks	Storage of scrap sealers, adhesives, paint thinners, and solvents	Closure of the area was accepted by MDNR in February 1988.
F-5	Former Fiero Wastewater Treatment Plant (WWTP): 100 yards north of Owens Street	Managed wastewater, wastewater treatment sludge, paint sludge, and Bonderite sludge	The former Fiero WWTP operated from 1977 to 1983. Consisted of above grade tanks situated on a concrete pad with secondary containment. No known releases reported. No further action was recommended in the CCR.
F-6	Waste Purge Thinner UST and Three Product USTs: Located north of Plant 17, directly west of the Paint Mix Building	Spent purge thinner	In 1989, 60 yds ³ of soil were removed and the USTs were removed and closed. A Closure report for the waste purge thinner UST was submitted to MDNR in Jan. 1995. Final closure is being pursued through the RCRA Corrective Action process.
F-7	Wastewater Collection Sumps: Located in the basement of the Powerhouse	Industrial wastewater	The sumps were cleaned and inspected. In addition, two groundwater monitoring wells were installed.

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Pontiac North Campus – Former Fiero Properties

Area ID	AOI Description	Materials Managed	RFI/Interim Measures Activities
F-8	Paint Sludge Storage Area Located north of Plant 17 with an unbermed 12' x 24' concrete pad with a corrugated roof	Storage of non-hazardous paint sludge and sludge from filtering waste Bonderite	The road salt was removed, and the concrete pad, trench, and sump was inspected for integrity of concrete. One monitoring well was installed.
F-9	Temporary Container Storage Area: East of the Powerhouse	Stored waste gasoline, solvent, and paint wastes	Location and timeline of storage area uncertain. No known releases reported. No further action was recommended in the CCR.
F-10	High-Pressure Fly Ash Storage Silo: Silo east of the Powerhouse	Non-hazardous fly ash	No further action was recommended in the CCR.
F-11	Low-Pressure Fly Ash Storage Silos: Silos east of the Powerhouse	Non-hazardous coal fly ash	No further action was recommended in the CCR.
F-12	Coal Storage Area Located southeast of the Powerhouse	Coal (Reported waste solvent added to coal to increase BTU)	Two groundwater monitoring wells were installed.
F-13	Former Oily Pea Gravel, Concrete, and Debris Area Located in the northeast corner of Plant 17	Oily pea gravel, concrete, and debris	Completed three soil borings; oil pea gravel, concrete, and debris were removed in February 1996
F-14	Fuel AST Area - Located west of the low- pressure fly ash storage silos - The area included three ASTs	Diesel fuel and gasoline	Two soil borings were completed in this area.
F-15	Oil/Solvent Catch Basin - Located in the Fiero Loading dock - Potential source of cVOC impacts	Unknown oil sludge and solvents	The catch basin was cleaned and inspected. In addition, two soil borings were completed and one groundwater monitoring well was installed.
F-16	Fiero Plant 17 VOCs File review of historical NPDES permit indicated effluent limits for tetrachloroethylene (PCE); PCE was used as a degreaser in metal fabrication operations.	PCE	As part of investigative activities, seven soil borings were completed, and seven groundwater monitoring wells were installed.

Area ID	AOI Description	Materials Managed	RFI/Interim Measures Activities
F-17	Parking Lot West of Fiero Located west of Plant 17	Unknown - former businesses on the property included a filling station, automotive repair, and agricultural	As part of investigative activities, 21 soil borings were completed, and five groundwater piezometers were installed.

2 Geologic Setting

This section describes the geologic setting for the Site based on available monitoring well, borehole data, and other information. Data developed during previous investigations along with information obtained during the implementation of the RFI were used for this assessment.

2.1 Site Geologic Setting

The surface of the Site is generally covered by concrete, asphalt, and associated subbase, or structures. Site overburden geology generally consists of a thin layer of fill material found below the surface cover or occasionally at the surface, typically ranging from 5 to 10 feet thick; if present. Underlying the fill material is a unit of interbedded clays, silts, sands, and gravel. This unit ranges in thickness from 20 to 30 feet thick and is present near the surface in areas where the fill material is missing. Beneath the interbedded unit is a unit of fine-grained sand ranging from 10 to 15 feet thick in the northern portion of the Site to approximately 30 feet thick in certain areas in the southern portion of the Site. This is the uppermost water bearing unit at the Site and the unit in which the monitoring wells are screened. A continuous, low permeability, basal clay unit is present beneath the sand unit and is encountered 30 to 45 feet below ground surface. Site geology, based on the available boring logs, is shown on the geologic cross sections provided as **Figures 3** through **3B**. A geologic description for each of the units is shown in the exhibit below:

Unit	Depth Range	Geologic Description
Fill	Site 0.0 – 10.0 ft. bgs.	Fill material: Generic term referring to reworked native soils, foundry sands, and imported soils resulting from preparation for construction and reworking of the land over time.
Interbedded	Site 0.0 – 30 ft. bgs.	A unit made up of interbedded fine sands, low plasticity silts and clays, and angular gravel.
Sand	Site 10.0 – 45 ft. bgs.	SAND, fine; trace silt; well sorted.
Basal Clay	Site 30 – 45 ft. bgs.	SILTY CLAY, low plasticity; trace gravel; stiff.

Exhibit 3: Site Geologic Unit Descriptions.

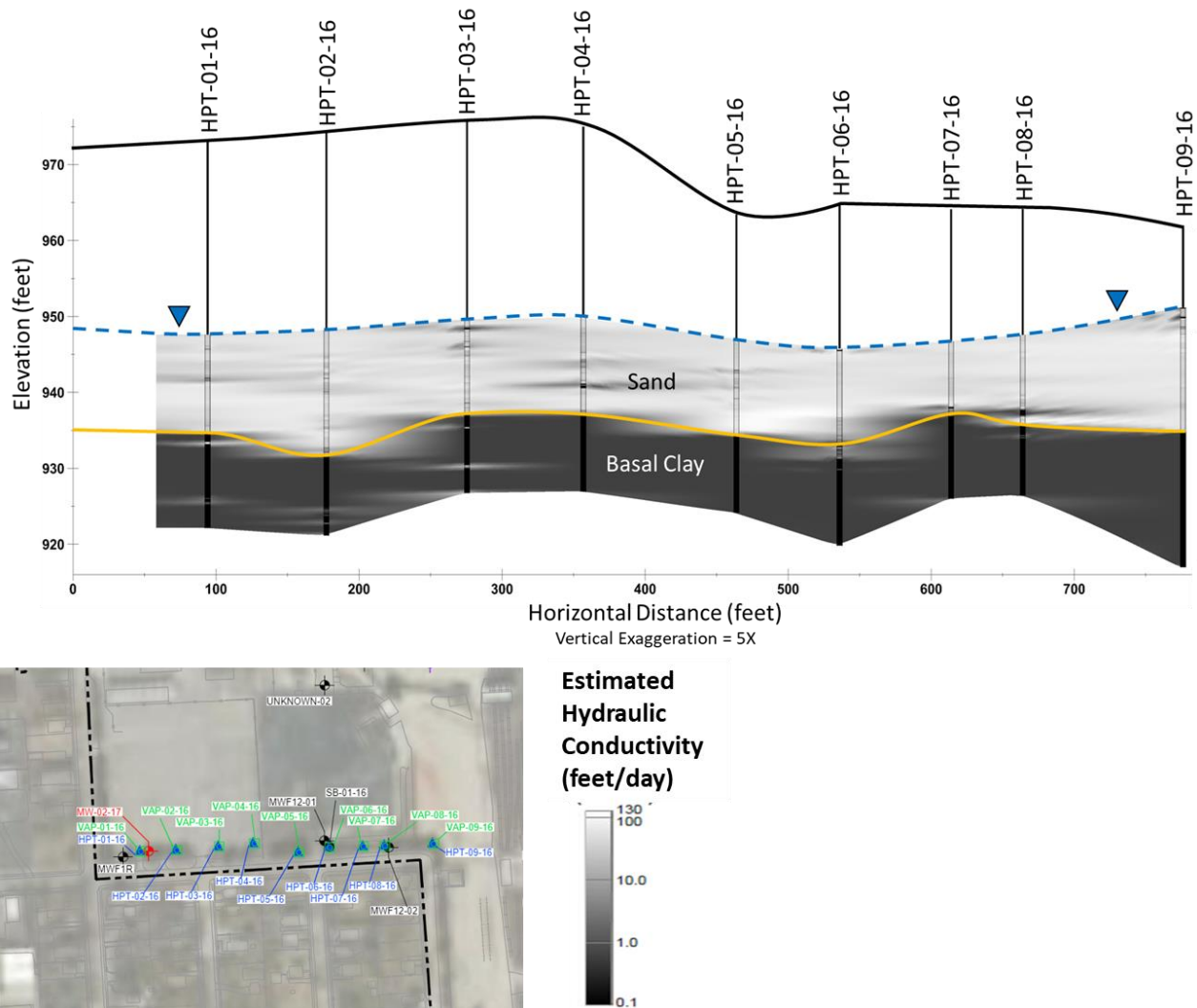
2.2 Site Hydrogeologic Setting

Groundwater is typically first encountered at depths ranging from approximately 20 to 27 feet below ground surface (ft bgs) at the Site as an unconfined water table. An exception to this is the downgradient southern boundary of AOI F-12 where groundwater is first encountered as approximately 15 ft bgs. The majority of the monitoring wells located on-site are screened in the sand unit. In general, the groundwater flow direction follows the topography of the Site, with the horizontal component of the groundwater flow to the south and southwest toward a series of small lakes (Harris, Terry, and Osmun). The approximate horizontal hydraulic gradient across the Site is 0.005 (foot per foot [ft/ft]) as calculated between MWF16-05 and MWF16-16. Typical groundwater contours along with the groundwater flow direction is shown on **Figure 4**.

2.2.1 Hydraulic Conductivity

Based on the results of previous aquifer testing (slug testing) at select monitoring well locations performed at the Site, the hydraulic conductivity ranges from approximately 5 to 100 feet per day (ft/day) (Arcadis 2012). In 2016, an investigation at the southern Site boundary using the hydraulic profiling tool (HPT) was completed in the southwest corner of the Site along the property boundary (Arcadis 2017). As shown in the exhibit below, the estimated hydraulic conductivity from this investigation ranged from less than 0.1 ft/day within the basal clay unit to over 100 ft/day within the sand unit.

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Pontiac North Campus – Former Fiero Properties



There are three storm water discharge points from the Site, as shown on **Figure 5**. The storm water outfalls from the Site are:

A groundwater sample was collected at MW-08-21 that also exceeded the residential SSVIAC. Currently, there are no monitoring wells down

The results shown on **Exhibit 7** are for average hydraulic values and would be expected to vary based on site specific considerations such

March 2021 and June 2021 events include an exceedance of residential SSVIAC within the 100-foot buffer zone associated with

- The soil vapor analytical result from SV-02-21 exceeded the residential SSVIAC at a depth of 2

8 References

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Summary of Soil Analytical Results
RACER Trust Pontiac North Campus

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