



MEMORANDUM

TO: Vicki Katko, MDEQ
Grant Trigger, RACER

REF. NO.: 017303

FROM: Beth Landale/sp/131 Det.

DATE: August 10, 2011

CC: David Favero, RACER
Amandeep Bains, CRA

RE: Vinyl Chloride Delineation Work Plan
Company Vehicle Operations Area
Ypsilanti, Michigan

DRAFT FOR DISCUSSION

1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) has prepared this memorandum to summarize the scope of work (SOW) for investigating the migration of chlorinated volatile organic compounds (CVOCs) specifically vinyl chloride in the groundwater beyond the southern boundary of the Company Vehicle Operations (CVO) Area, located in Ypsilanti, Michigan (Site). Previous investigations at the Site have shown elevated concentrations of CVOCs in groundwater at the Site.

The purpose of this investigation is to determine the migration pathways and concentrations of vinyl chloride beyond the southern property boundary, and specifically if vinyl chloride enters Willow Run Creek south of Tyler Pond at concentrations greater than the Michigan Part 201 groundwater-surface water interface (GSI) criteria.

2.0 BACKGROUND

Groundwater levels have been collected on a regular basis at the CVO property to determine seasonal groundwater flow conditions. These groundwater monitoring results show a consistent flow direction at the Site, with a groundwater divide that extends through the center portion of the Site running west to east. Groundwater north of this divide moves north and east towards Tyler Pond, while groundwater south of the divide moves to the south and southeast towards Tyler Road. Figure 1 identifies the groundwater divide.

Southern boundary wells MW-4, MW19-01, MW19-02, MW19-03, MW-14, and MW19-24 were sampled on a regular basis as part of the Site groundwater monitoring events. Groundwater samples collected during the monitoring events were analyzed for target compound list (TCL) volatile organic compounds (VOCs). Generally, the concentrations of the constituents detected in the groundwater have been consistent in this area of the Site over the past 6 years. The data indicates that concentrations along the southern property

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boundary are highest between monitoring wells MW19-02 and MW19-24, while concentrations east and west of these locations decrease substantially. Figure 1 presents a summary of the CVOC data.

Based on contaminant concentrations and groundwater flow patterns, a preferential pathway appears to be present between the Haulaway Building and the southern property boundary near monitoring wells MW19-02 and MW19-24. A preferential pathway investigation was completed in 2007 to look at the concentrations of CVOCs between the Haulaway Building and the southern property boundary. Investigation activities included the collection of borehole water samples along several transects perpendicular to the flow path and an electrical resistivity survey of the property boundary. The analytical results of the 2007 preferential pathway data are presented on Figure 1, including an iso concentration contours for vinyl chloride. The investigation confirmed the likely presence of a preferential pathway.

As shown on the Figure 1, CVOCs, primarily vinyl chloride, are not fully delineated beyond the southern property boundary. A monitoring well is located off-Site along the bank of Willow Run Creek; analytical results have not indicated any exceedances of Part 201 criteria since 2006, when vinyl chloride exceeded GSI and drinking water criteria.

3.0 SCOPE OF WORK

The scope of work includes the following tasks:

Task 1 – Vinyl Chloride Delineation Activities

Task 2 – Obtaining Information from Fons Landfill

Task 3 – Sitewide Groundwater Monitoring Event

Task 1 – Vinyl Chloride Delineation Activities

A GeoProbe will be used to complete eight soil borings which will be converted into monitoring wells. Five monitoring wells (MWOS-01 through MWOS-05) will be completed off-Site along the south side of Tyler Road, at approximately 200 foot intervals. Three monitoring wells (MW19-29 through MW19-31) will be completed on-Site. The proposed locations of the monitoring wells are presented on Figure 1. It is anticipated that access agreements will be required, as the majority of these locations will be off-Site.

Soil borings will be completed at least six inches into the confining clay layer for this SOW (approximately 20 feet below ground surface (bgs)). The monitoring wells will be installed such that the bottom of the ten-foot screen is sunken into the clay and the top of the screen is above the water table. Ten foot screens have traditionally been used at this Site to monitor both the confining clay surface for DNAPL and the water table surface for LNAPL that are related to historical filling activities. Utility clearance approval (MISSDIG and private utility locator) will be obtained prior to the drilling activities.

Soil samples will be collected at the 0-2 foot bgs interval, between 8-10 foot bgs interval, and the two-foot interval above the water table at on Site wells MW19-29 through MW19-31. If the water table is encountered near 8-10 feet bgs, only one soil sample will be collected from that interval. Additional soil

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samples may be collected at intervals where odor, staining, or elevated photoionization detector (PID) readings are observed.

Soil samples will not be collected from off-Site borings unless impacts such as staining, odor, or high PID readings are observed.

Where collected, soil samples will be analyzed for TCL VOCs, TCL Semi-volatile organic compounds (SVOCs), Target Analyte List (TAL) metals and polychlorinated biphenyls (PCBs). Table 1 summarizes the soil sampling program for this SOW.

The eight new monitoring wells will be developed prior to sampling to remove fines from the wells. Groundwater samples will be collected using a peristaltic pump and analyzed for TCL VOCs, TCL SVOCs, Site TAL Metals, and PCBs at the three new wells located on Site (MW19-29 through MW19-31) and only for TCL VOCs at the off-Site wells (MWOS-01 through MWOS-05). Groundwater samples will be collected approximately 3 feet above the confining clay to be consistent with the existing Site groundwater sampling protocol.

Waste generated from the on-Site and off-Site locations will be segregated in different drums. Soil cuttings will be containerized in 55-gallon drums and staged on-Site for proper waste characterization and disposal. Decontamination fluids and purged water will be treated through the on-Site water treatment system.

Task 2 – Sitewide Groundwater Monitoring Event

As previously discussed the groundwater at the Site is impacted with CVOCs. A groundwater monitoring event will be completed concurrent with the new well sampling to evaluate VOC concentrations both south and north of the groundwater divide. Groundwater levels will be recorded to monitor groundwater flow conditions. Groundwater samples will be collected from thirty-five locations for TCL VOCs analysis. Figure 2 presents groundwater sampling locations. Table 2 summarizes the groundwater sampling plan.

Decontamination fluids and purged water will be treated through the on-Site water treatment system.

Task 3 – Obtaining Information from Fons Landfill

The Fons Landfill is located across Tyler Road to the South of the Site. EQ – The Environmental Quality Company, the current operator of the Fons Landfill, will be contacted to obtain additional information regarding the landfill. This includes the construction and location of the clay containment surrounding the landfill, groundwater flow maps, and groundwater level and analytical data from monitoring wells on or adjacent to the Fons Landfill site.

Access will be requested to collect groundwater levels and samples (if needed) from wells on or adjacent to the landfill for this scope of work.

DRAFT FOR DISCUSSION**4.0 SCHEDULE**

The work described in this memorandum will be initiated following approval from RACER and MDEQ to proceed.

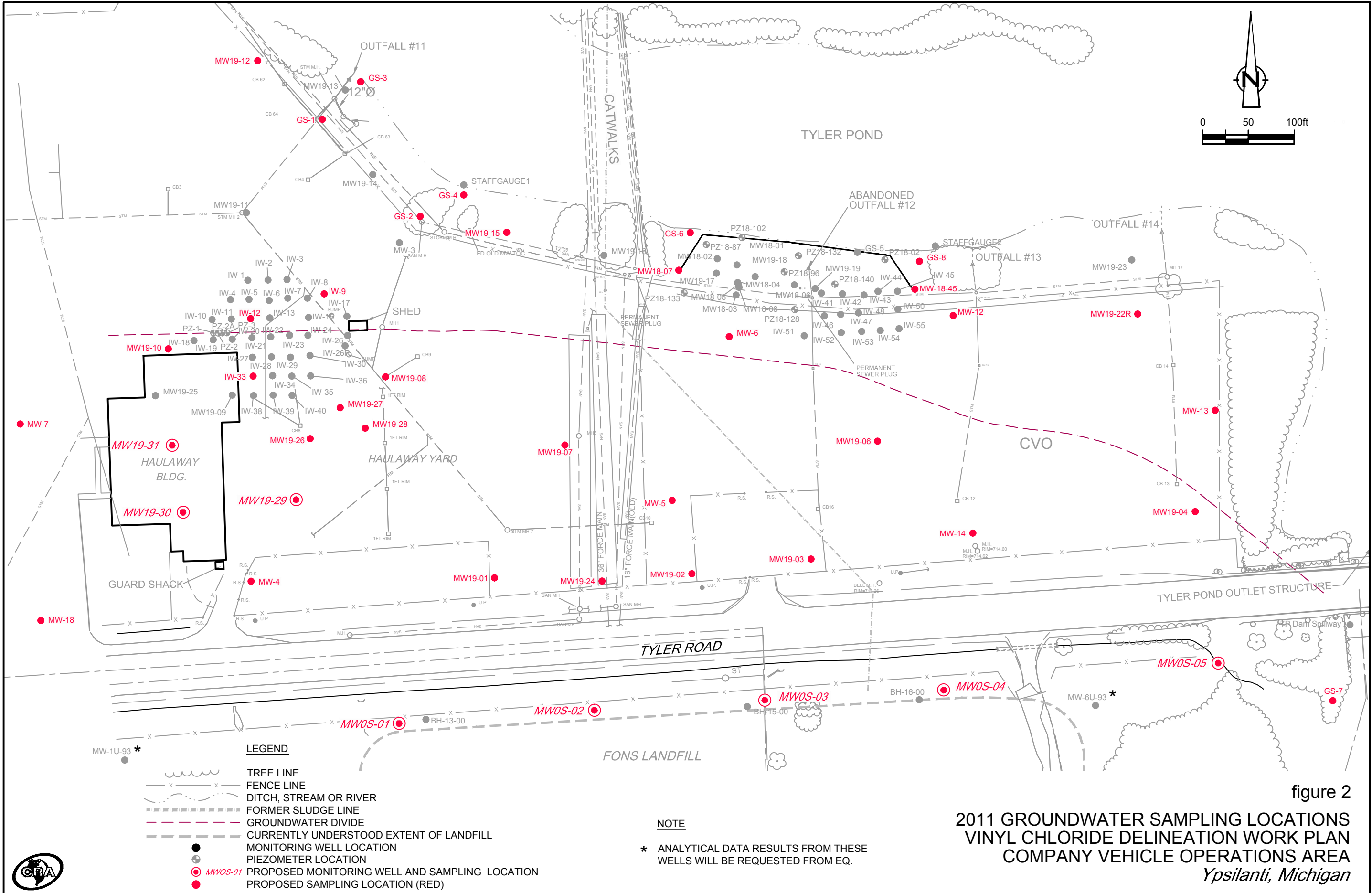


TABLE 1

**SOIL SAMPLING PROGRAM
VINYL CHLORIDE DELINEATION WORK PLAN
FORMER GENERAL MOTORS COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN**

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Boring/Well ID	Target Depth	Sample Intervals (feet bgs)	Analysis
On-Site Locations			
MW19-29	6 inches into Clay	0-2, 8-10, 2 feet above the water table ¹ , and Field observations ²	TCL VOCs, TCL SVOCs, Site TAL metals, and PCBs
MW19-30	6 inches into Clay	0-2, 8-10, 2 feet above the water table ¹ , and Field observations ²	TCL VOCs, TCL SVOCs, Site TAL metals, and PCBs
MW19-31	6 inches into Clay	0-2, 8-10, 2 feet above the water table ¹ , and Field observations ²	TCL VOCs, TCL SVOCs, Site TAL metals, and PCBs
Off-Site Locations			
MWOS-01	6 inches into Clay	Field Observations ³	TCL VOCs, TCL SVOCs, Site TAL metals, and PCBs
MWOS-02	6 inches into Clay	Field Observations ³	TCL VOCs, TCL SVOCs, Site TAL metals, and PCBs
MWOS-03	6 inches into Clay	Field Observations ³	TCL VOCs, TCL SVOCs, Site TAL metals, and PCBs
MWOS-04	6 inches into Clay	Field Observations ³	TCL VOCs, TCL SVOCs, Site TAL metals, and PCBs
MWOS-05	6 inches into Clay	Field Observations ³	TCL VOCs, TCL SVOCs, Site TAL metals, and PCBs

Notes:

¹ If the 8-10 foot interval is at or near the water table, only one sample will be collected from this interval.² Additional samples may be collected at intervals where field observations indicate impacts
(i.e. odors, staining, elevated PID readings)³ Samples will be collected at locations where field observations indicate impacts
(i.e. odors, staining, elevated PID readings)

bgs - below ground surface

TCL - Total Contaminant List

VOCs - Volatile Organic Compounds

SVOCs - Semi-Volatile Organic Compounds

TAL - Target Analyte List

PCBs - Polychlorinated Biphenyls

2011 GROUNDWATER SAMPLING PLAN DRAFT FOR DISCUSSION
VINYL CHLORIDE DELINEATION WORK PLAN
FORMER GENERAL MOTORS COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

Monitoring Well ID	Analysis	Sampling Reason
New Locations		
MWOS-01	TCL VOCs	Off-Site VC delineation
MWOS-02	TCL VOCs	Off-Site VC delineation
MWOS-03	TCL VOCs	Off-Site VC delineation
MWOS-04	TCL VOCs	Off-Site VC delineation
MWOS-05	TCL VOCs	Off-Site VC delineation
MW19-29	TCL VOCs, TCL SVOCs, Site TAL Metals, PCBs	On-Site VC delineation
MW19-30	TCL VOCs, TCL SVOCs, Site TAL Metals, PCBs	Additional delineation beneath Haulaway Building
MW19-31	TCL VOCs, TCL SVOCs, Site TAL Metals, PCBs	Additional delineation beneath Haulaway Building
North of Groundwater Divide		
MW19-12	TCL VOCs	Monitor Site perimeter
GS-1	TCL VOCs	Monitor Site perimeter
GS-2	TCL VOCs	Monitor Site perimeter
GS-3	TCL VOCs	Monitor Site perimeter
GS-4	TCL VOCs	Monitor Site perimeter
GS-6	TCL VOCs	Monitor Site perimeter
GS-8	TCL VOCs	Monitor Site perimeter
MW19-15	TCL VOCs	Monitor Site perimeter
MW18-07	TCL VOCs	Monitor Site perimeter
MW18-45	TCL VOCs	Monitor Site perimeter
MW-12	TCL VOCs	On-Site VC delineation
MW19-22R	TCL VOCs	Monitor Site perimeter
MW-6	TCL VOCs	On-Site VC delineation
IW-9	TCL VOCs	On-Site VC delineation
IW-12	TCL VOCs	On-Site VC delineation
MW-13	TCL VOCs	Monitor Site perimeter
South of Groundwater Divide		
MW19-06	TCL VOCs	On-Site VC delineation
MW-5	TCL VOCs	On-Site VC delineation
MW19-07	TCL VOCs	On-Site VC delineation
MW19-08	TCL VOCs	On-Site VC delineation
MW19-26	TCL VOCs	On-Site VC delineation
MW19-27	TCL VOCs	On-Site VC delineation
MW19-28	TCL VOCs	On-Site VC delineation
IW-33	TCL VOCs	On-Site VC delineation
MW19-10	TCL VOCs	On-Site VC delineation
MW-7	TCL VOCs	Monitor Site perimeter
MW19-01	TCL VOCs	Monitor Site perimeter
MW19-02	TCL VOCs	Monitor Site perimeter
MW19-03	TCL VOCs	Monitor Site perimeter

2011 GROUNDWATER SAMPLING PLAN DRAFT FOR DISCUSSION
VINYL CHLORIDE DELINEATION WORK PLAN
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Monitoring Well ID	Analysis	Sampling Reason
South of Groundwater Divide (continued)		
MW19-04	TCL VOCs	Monitor Site perimeter
MW19-24	TCL VOCs	Monitor Site perimeter
MW-4	TCL VOCs	Monitor Site perimeter
MW-18	TCL VOCs	Monitor Site perimeter
MW-14	TCL VOCs	Monitor Site perimeter
Off-Site		
GS-7	TCL VOCs	Monitor downgradient discharge point to creek

Notes:

VC - Vinyl Chloride

TCL - Total Contaminant List

VOCs - Volatile Organic Compounds

SVOCs - Semi-Volatile Organic Compounds

TAL - Target Analyte List

PCBs - Polychlorinated Biphenyls