

MEMO

To:

Nate Nemani
USEPA Region 5
77 West Jackson Boulevard
Mail Code: LU-9J
Chicago, Illinois 60604-3507

Copies:

Dave Favero, RACER

Arcadis of Michigan, LLC

28550 Cabot Drive

Suite 500

Novi

Michigan 48377

Tel 248 994 2240

Fax 248 994 2241

From:

Christi Kiker

Date:

March 28, 2017

Arcadis Project No.:

B0064607.2017

Subject:

1,4-Dioxane Supplemental Investigation Scope of Work
RACER Pontiac North Campus Site
Pontiac, Michigan

On behalf of Revitalizing Auto Communities Environmental Response Trust (RACER), Arcadis of Michigan, LLC (Arcadis) has prepared this Scope of Work to further assess the presence of 1,4-dioxane in groundwater at the Pontiac North Campus Site in Pontiac, Michigan (Site). The supplemental data collected will be used to further refine the Conceptual Site Model in support of evaluating potential exposure pathways and subsequent development and evaluation of corrective measures in the Corrective Measures Study.

1. BACKGROUND

To help assess the potential strength and transport mechanism for previously identified 1,4-dioxane impacts at the Site, a mass flux investigation was performed in December 2016 in accordance with the *Work Plan to Investigate the Presence of 1,4-Dioxane* (dated November 16, 2016). As part of this investigation, soil borings were completed near the southern property boundary of the former Fiero property to further characterize the nature and extent of 1,4-dioxane impacts and other volatile organic compounds (VOCs). The borings were completed along a transect using a Geoprobe® Hydraulic Profiling Tool (HPT) to map zones of higher permeability within the saturated zone. Based on the HPT results, vertical aquifer profiling (VAP) sampling was performed at each boring location, biased to the more

permeable zones. In addition, groundwater samples were collected from select existing monitoring wells in the Fiero area and downgradient of Light Non-Aqueous Phase Liquid (LNAPL) Area 1/7 (Area of Interest [AOI] W-10) and within LNAPL Area 10 (AOI W-8) for 1,4-dioxane and VOC analysis.

2. INVESTIGATION RESULTS

The results of the mass flux investigation were used to map the hydrostratigraphy and groundwater impacts at high-resolution, to identify preferential flow paths, and to evaluate the strength of associated 1,4-dioxane concentrations migrating off site. Transect and groundwater sampling results are discussed in the presentation included as **Attachment 1**.

At the Fiero downgradient property boundary, 1,4-dioxane was detected at two transect locations at concentrations exceeding 2016 Michigan Department of Environmental Quality (MDEQ) Part 201 drinking water criteria (7.2 micrograms per liter [$\mu\text{g/L}$]), which was established per emergency order in 2016. However, the downgradient area is within a groundwater restriction zone per a City of Pontiac Ordinance, no water supply wells were identified in the downgradient area pursuant to a 2014 well survey, and the maximum detection of 1,4-dioxane (28 $\mu\text{g/L}$) at transect boring location VAP-01-16 does not exceed the 2016 MDEQ Part 201 vapor intrusion screening level (29 $\mu\text{g/L}$).

Downgradient of LNAPL Area 1/7 (AOI W-10) and within LNAPL Area 10 (AOI W-8), 1,4-dioxane and other VOCs were not detected.

3. PROPOSED SCOPE OF WORK

Based on the results of the mass flux investigation, the following scope of work is proposed to further assess the extent of 1,4-dioxane impacts at the Site:

Fiero Downgradient Property Boundary

- Install one monitoring well with a five-foot screen near VAP-01-16 and locate the top of the screen at or just below the water table
- Sample the new well and three adjacent existing wells (MWF1R, MWF12-01, and MWF12-02) quarterly for one year
- Sample existing up gradient wells (MWF7-01, MWF7-02, MWF7-03, and MWF16-15) semi-annually for two events

Downgradient of LNAPL Area 1/7 and LNAPL Area 10

- Install one monitoring well with a five-foot screen west of TW-MD-01 and locate the top of the screen at or just below the water table
- Sample the new well and two adjacent existing wells (MWW1-06 and MWW1-15) quarterly for one year
- Sample existing up gradient wells (MWW10-SEN02 and MWW10-SEN03) semi-annually for two events

The investigation locations are illustrated in **Figure 1**. The results will be summarized in a memorandum that includes analytical summary tables, well construction logs, figures illustrating updates to the mass flux transect results, and proposed follow-up activities, if necessary.

4. SCHEDULE

Proposed well installation and the initial sampling event are scheduled to be conducted in April 2017. An initial summary memorandum including results from the well installation and initial quarterly sampling activities are expected to be completed and submitted to the U.S. Environmental Protection Agency (USEPA) by July 2017.

Subsequent quarterly monitoring (three events) will occur beginning in July 2017. A brief summary of results will be provided within six weeks after completion of each quarterly sampling event.

Figures

Figure 1 1,4-Dioxane Investigation Locations

Attachments

Attachment 1 HPT/VAP Results Summary Presentation

RACER PNC – 1,4-DIOXANE EVALUATION

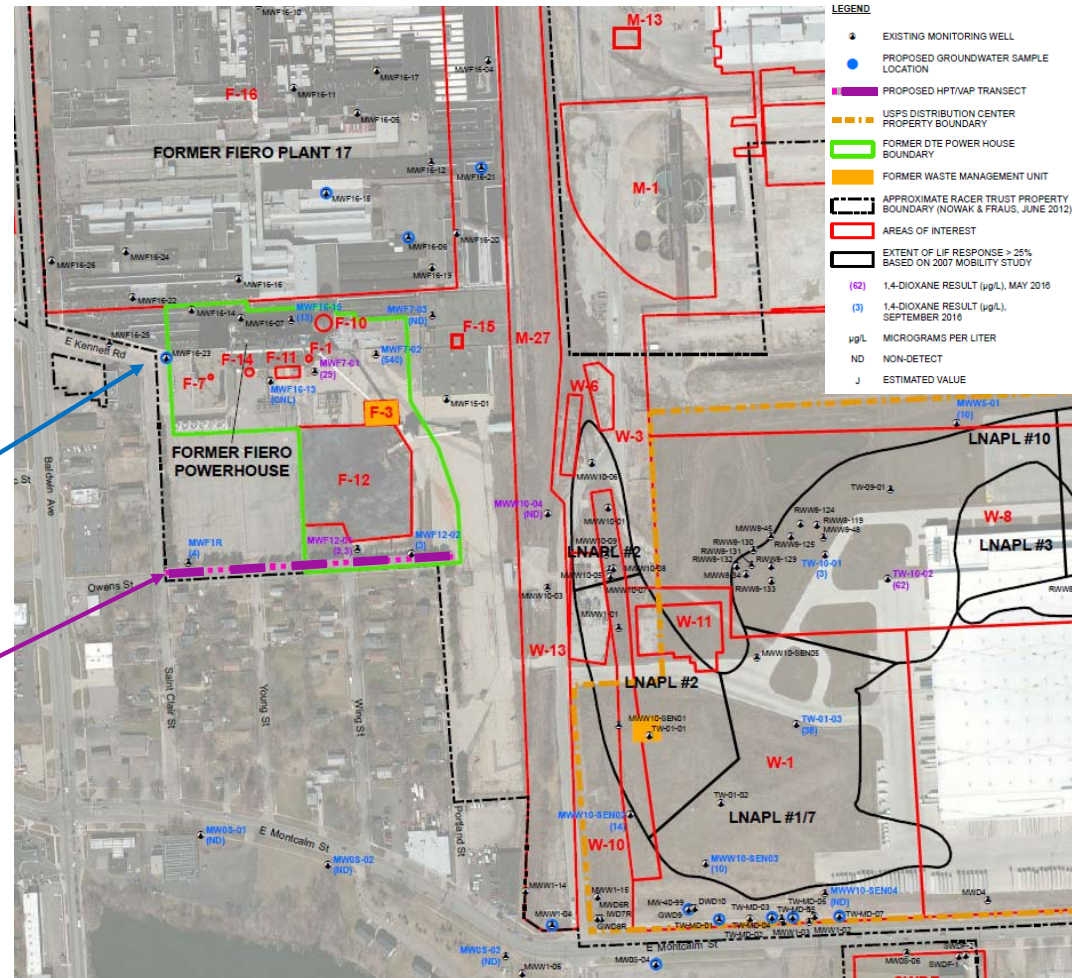
December 2016

Scope of Work

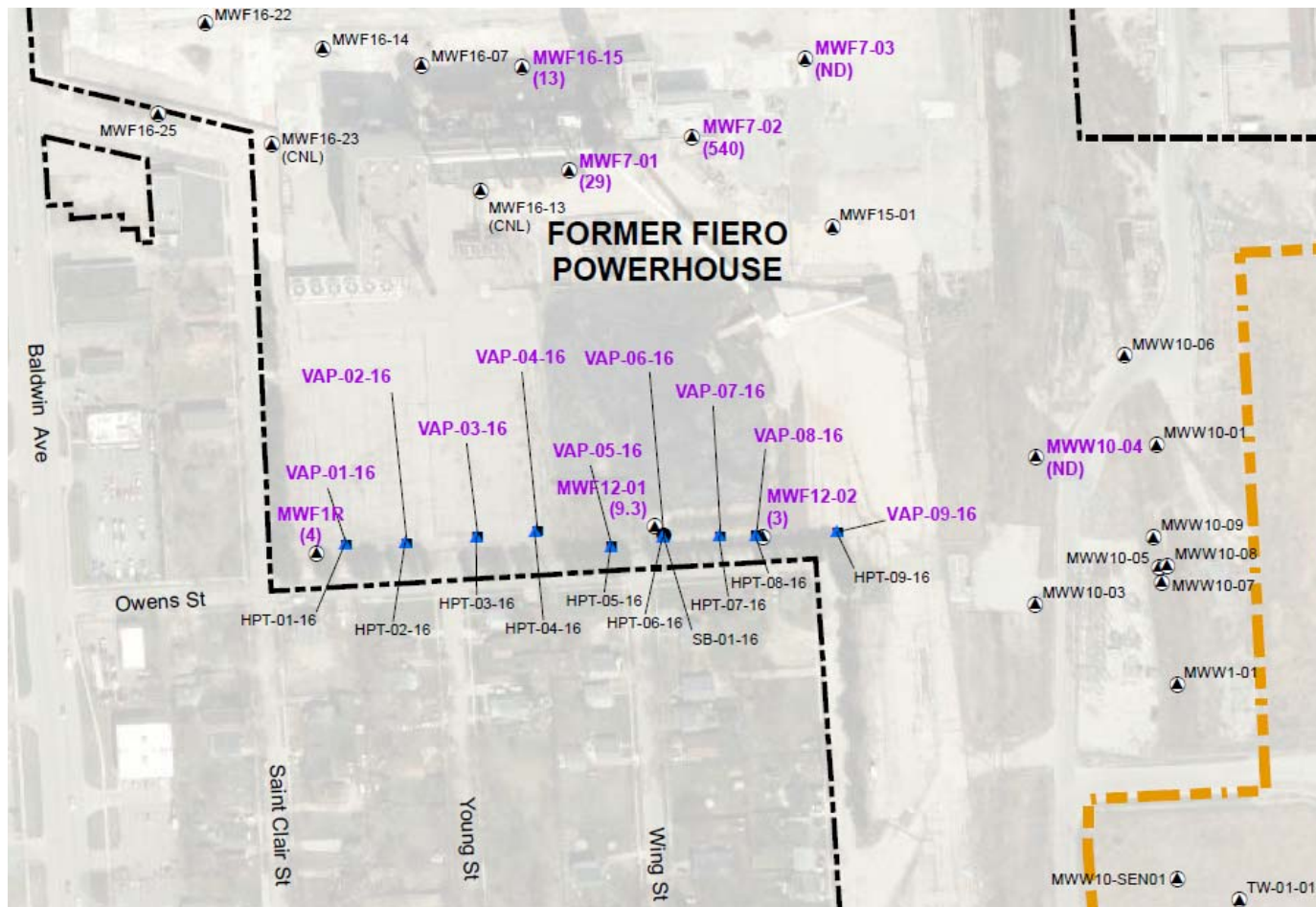
Objective: Evaluate potential extent and magnitude of 1,4-dioxane impacts at Former Fiero and Montcalm Street

Scope:

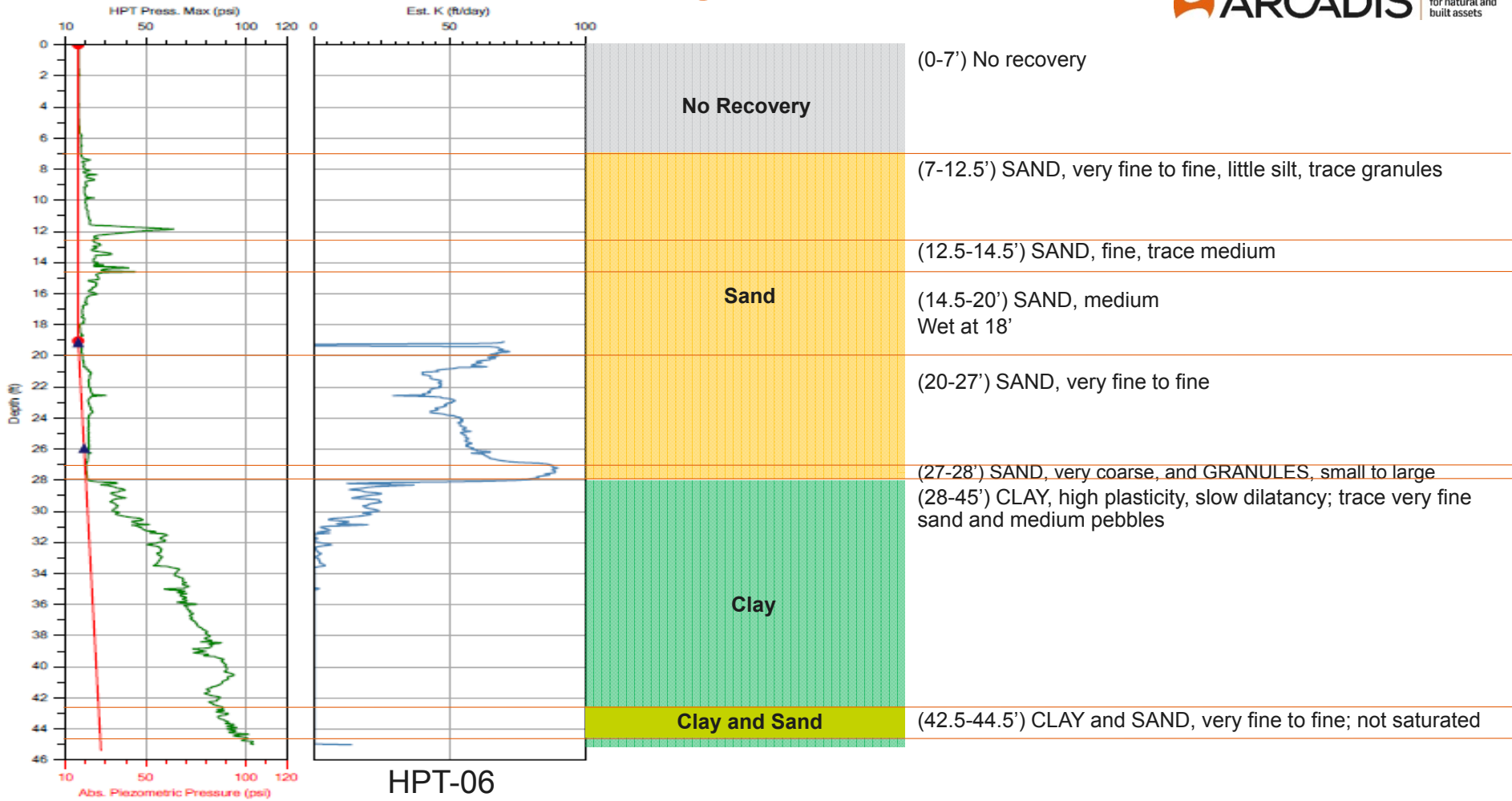
- Sample existing monitoring wells where available
- Complete HPT/VAP transect at Fiero southern property boundary and evaluate potential zones of 1,4-dioxane flux off-site



Former Fiero

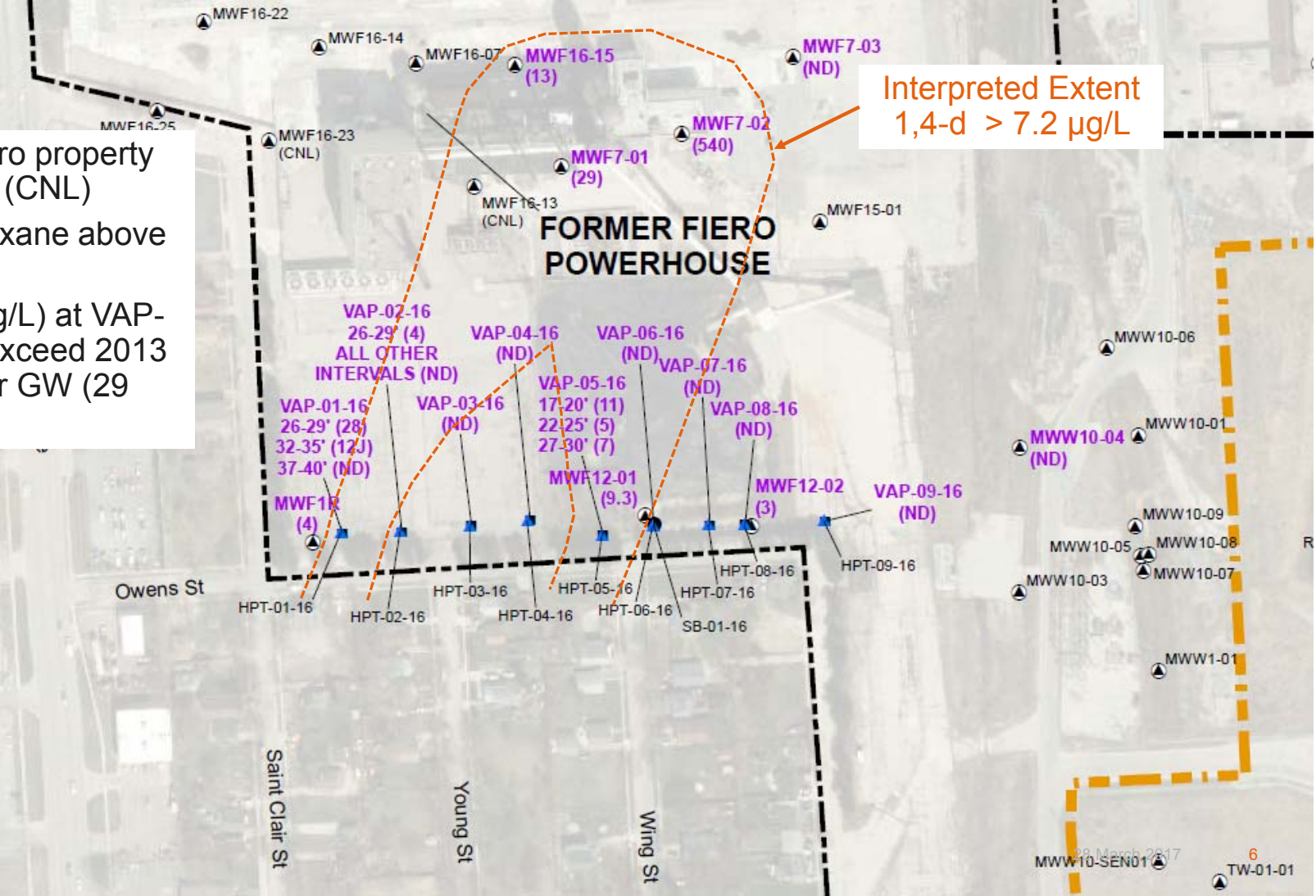


HPT Response and Calibration Boring



Fiero Area Results

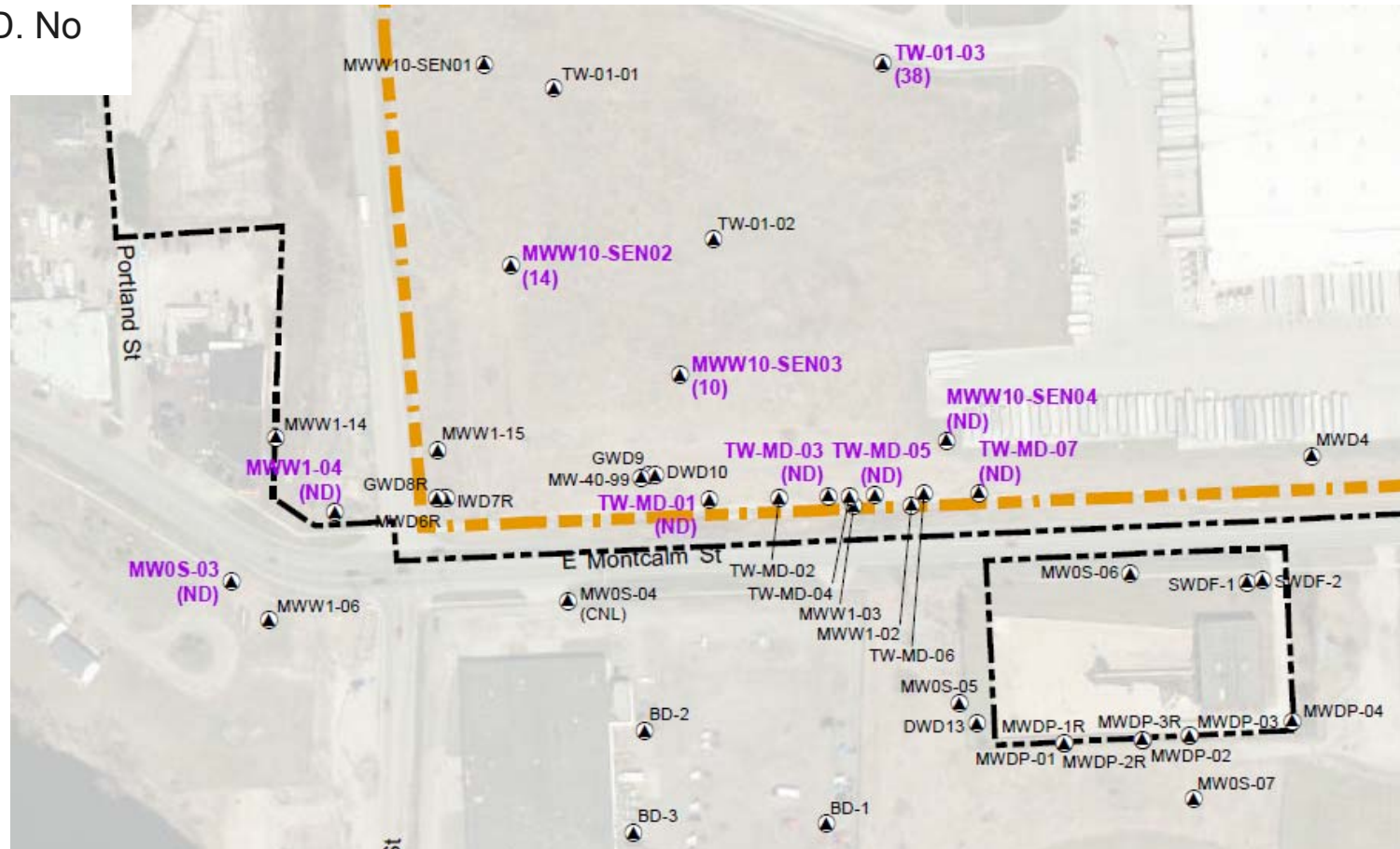
- Multiple wells on Fiero property could not be located (CNL)
- Two areas of 1,4-dioxane above 7.2 µg/L
- Max detection (28 µg/L) at VAP-01 26-29' does not exceed 2013 VI screening level for GW (29 µg/L)



Interpreted Extent
1,4-d > 7.2 µg/L

Montcalm Street Area Results

- All results are ND for 1,4-D. No other VOC detections



Discussion

- 1,4-Dioxane above Drinking Water Criteria at Fiero property boundary
 - Max concentrations below 2016 VI screening levels
 - Area covered by groundwater restriction ordinance
 - Additional delineation required?

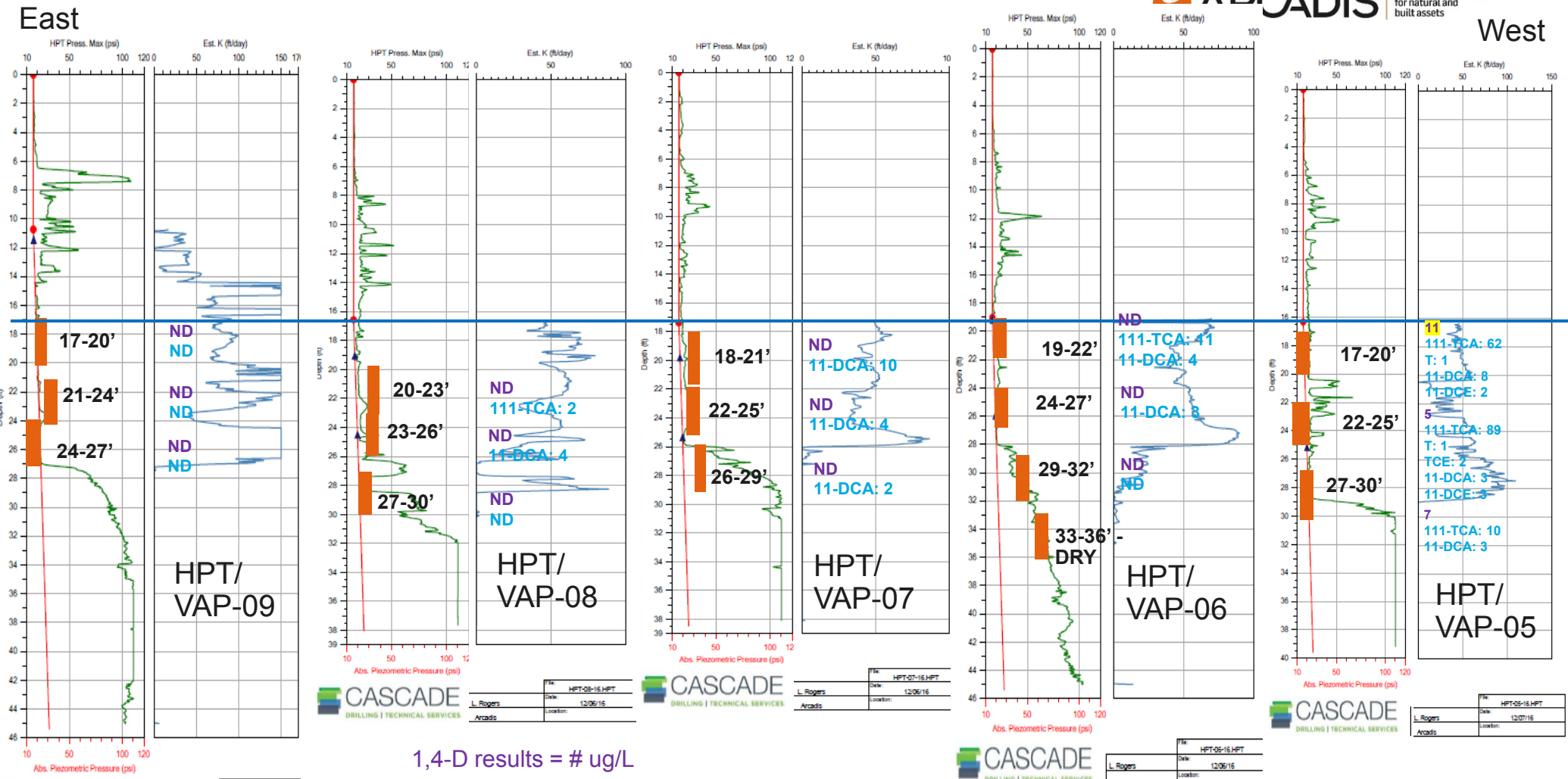
- Montcalm wells non-detect for 1,4-dioxane
 - Additional samples for verification?

Recommendations

- Install one monitoring well near VAP-01-16 on Fiero Property
 - Sample quarterly along with three nearby existing wells for 4 quarters.
 - Sample four up-gradient wells semi-annually for 2 events.
- Install one monitoring well in downgradient LNAPL #1/7 area
 - Sample quarterly along with two existing nearby wells for 4 quarters.
 - Sample two up-gradient wells semi-annually for 2 events.

HPT/VAP Results

East Half of Transect - HPT Results and VAP Intervals



1,4-D results = # ug/L

Other VOCs

Exceeds most conservative criteria (RDW 7.2 ug/L)

CASCADE
 DRILLING | TECHNICAL SERVICES

File:	HPT-05-15.HPT
Date:	12/06/16
Location:	Aracids

CASCADE
 DRILLING | TECHNICAL SERVICES

File:	HPT-07-15.HPT
Date:	12/06/16
Location:	Aracids

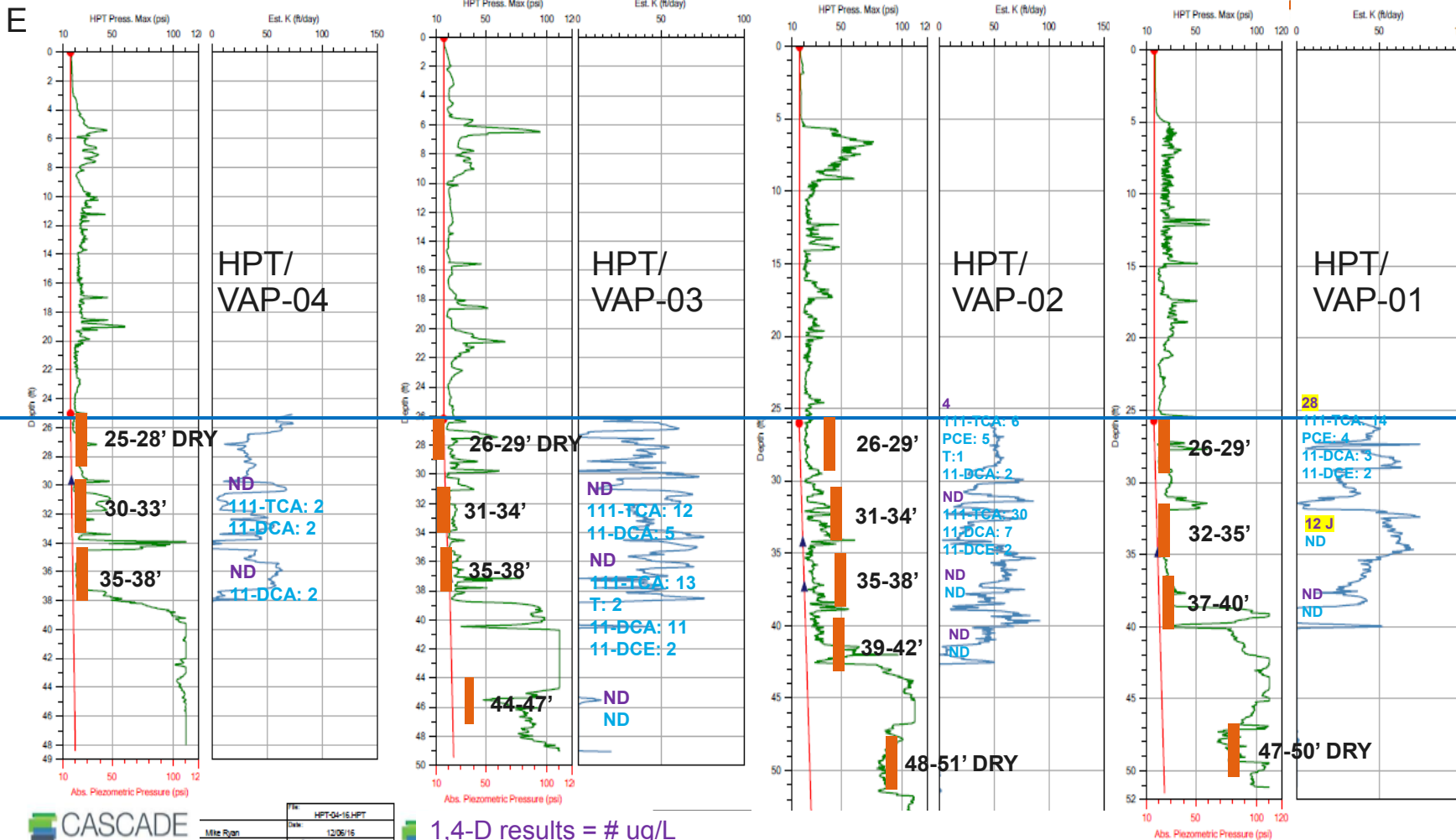
CASCADE
 DRILLING | TECHNICAL SERVICES

File:	HPT-06-15.HPT
Date:	12/06/16
Location:	Aracids

CASCADE
 DRILLING | TECHNICAL SERVICES

File:	HPT-05-15.HPT
Date:	12/07/16
Location:	Aracids

West Half of Transect - HPT Results and VAP Intervals



File:	HPT-Q1-15.HPT
Date:	12/06/16
Location:	APEX

1,4-D results = # ug/L

Other VOCs

Exceeds most conservative criteria (RDW 7.2 ug/L)



File:	HPT-Q1-15.HPT
Date:	12/07/16
Location:	Arcadis