MEMO

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Date:
August 15, 2023

Arcadis Project No.:
30075935

Subject:
1,4-Dioxane Final Report
RACER Trust, Buick City, Flint, Michigan

This memo was prepared by Arcadis of Michigan, LLC (Arcadis) to provide a final summary of 1,4-dioxane investigations completed at the Buick City Site (Site), located in Flint, Michigan (**Figure 1**). 1,4-Dioxane investigation activities completed from 2015 through September 2018 were previously presented in the *1,4-Dioxane Investigation Update (November 13, 2018),* which is included in **Attachment A**. This memo presents results of samples collected from November 2018 through October 2022 (**Tables 1-3**) as well as a final evaluation of 1,4-dioxane at the Site.

As previously presented the initial site screening did not detect 1,4-dioxane in any of the 12 monitoring wells sampled at the Southend of the Site; therefore, no additional investigation for 1,4-dioxane has been completed at the Southend. 1,4-Dioxane was previously detected above GSI criteria in groundwater samples collected at the Northend of the Site.

DATA EVALUATION

This data evaluation includes a comparison to applicable criteria for 1,4-dioxane. Applicable criteria for this evaluation are the GSI criterion of 280 micrograms per liter (ug/L). The groundwater/surface water interface surface water human drinking value (GSI-H) of 3.5 ug/L was removed as an applicable criterion when the

City of Flint announced the Flint River was no longer being used as a backup water source in case of emergency. Drinking water criteria are not applicable as there is not a complete pathway due to local restrictions on installation of drinking water wells in this area.

Data collected from November 2018 through October 2022 are presented in **Table 1** (Factory 36 Area), **Table 2** (Factory 10 Area), and **Table 3** (Factory 85/86 Area). **Figure 2** shows the locations where samples were collected from November 2018 through 2022.

FACTORY 36

As part of the 2019-2022 Site investigation activities 27 groundwater samples were collected from 16 Site monitoring wells (36-FP1, 36-FP4, MW-36-40, MW-OS-2, MW-OS-5, MW-OS-7, MW-OS-8, MW-OS-9, RFI-36-08, RFI-36-18, RFI-36-19, RFI-36-37, RFI-36-43, RFI-36-44, RFI-36-55R, and RFI-36-56) in the Factory 36 Area (**Figure 2**). None of the groundwater samples exceeded the GSI criterion of 280 ug/L (**Table 1**). In addition, concentrations of 1,4-dioxane generally decreased an order of magnitude from the highest concentrations previously detected in 2016/2017 (table below).

Monitoring Well	Previously Detected (2016/2017) Highest Concentration of 1,4-Dioxane	2019-2020 Concentration of 1,4-Dioxane	2022 Concentration of 1,4-Dioxane
36-FP1	290 ug/L	8 ug/L	Not Analyzed
36-FP4	Not Analyzed	7 ug/L	9 ug/L
MW-36-40	Not Analyzed	Not Detected	Not Detected
MW-OS-5	Not Detected	Not Detected	Not Analyzed
MW-OS-7	6 ug/L	13 ug/L	1.7 ug/L
MW-OS-8	13 ug/L	9 ug/L	1.2 ug/L
MW-OS-9	4 ug/L	6 ug/L	2
RFI-36-08	Not Analyzed	Not Detected	Not Detected
RFI-36-18	121 ug/L	8 ug/L	9 ug/L
RFI-36-19	Not Analyzed	Not Detected	Not Analyzed
RFI-36-37	13 ug/L	7 ug/L	Not Analyzed
RFI-36-43	Not Detected	Not Detected	13 ug/L [Not Detected]
RFI-36-44	130 ug/L	9 ug/L	Not Detected
RFI-36-55R	44 ug/L	16 ug/L	Not Analyzed
RFI-36-56	134 ug/L	34 ug/L	Not Analyzed

Based on the data collected from 2019 to 2022, as well as data previously discussed in the *2018 1,4-Dioxane Investigation Update* Memo (**Attachment A**); there does not appear to be a complete exposure pathway from the Site based on the following:

- Only one sample collected from the Factory 36 area exceeded GSI criteria. The sample was collected from 36-FP1, located onsite. Samples collected downgradient of the Site are below applicable criteria.

- Storm sewer samples collected from manhole MH 1-3 (**Attachment A**), which is located at the American Spiral Weld downgradient property boundary (shown on **Figure 2**), did not detect 1,4-dioxane.

- In 2017-2018 groundwater samples (**Attachment A**) collected from downgradient monitoring wells MW-OS-04, MW-OS-05 and MW-OS-06, located adjacent to the Outfall 001 storm sewer (shown on **Figure 2**), did not detect 1,4-dioxane. In addition, a sample collected from MW-OS-05 in 2020 also did not detect 1,4-dioxane. This indicates that groundwater infiltrating the Outfall 001 storm sewer east of Highway I-475 is not impacted with 1,4-dioxane.

- In 2017 samples collected from the Outfall 001 discharge point (DP 001) detected 1,4-dioxane at concentrations ranging from 4 to 6 ug/L, which is below the GSI criterion.

- Groundwater samples were collected from the downgradient-most monitoring wells evaluating the direct discharge pathway to the river (MW-OS-07 through MW-OS-09). Samples collected in 2020 and 2022 detected 1,4-dioxane at concentrations ranging from 1.2 to 13 ug/L, below the GSI criterion.

Based on the analytical data, only one sample collected on-Site in the Factory 36 area exceeded the GSI criterion. None of the downgradient samples detected 1.4-dioxane above the GSI criterion.

FACTORY 10

As part of 2019-2022 Site investigation activities groundwater samples were collected from three monitoring wells (MW-10-24, RFI-10-11 and RFI-10-26) and two soil borings (SB-10-75 and SB-10-76) in the Factory 10 Area. 1,4-Dioxane did not exceed the GSI criterion of 280 ug/L in any of these samples (**Table 2**).

Based on the data collected from 2019 to 2022, as well as data previously discussed in the *2018 1,4-Dioxane Investigation Update* Memo (**Attachment A**); there does not appear to be a complete exposure pathway from the Site based on the following:

- 1,4-dioxane was previously detected above the GSI criterion in one on-Site well (RFI-10-03) in March 2015 and one vertical aquifer profiling (VAP) location (OST2-8) downgradient of the Site.

However, groundwater samples collected from downgradient monitoring wells MW-10-22, MW-10-23, and MW-10-24 and borings OST 4-2 through OST 4-9 do not exceed the criterion. In addition, the concentration of 1,4-dioxane shows a decreasing trend at RFI-10-03 from 1,686 ug/l in September 2015 to 480 ug/l in October 2017.

- The 1,4-dioxane result from the one sample collected from the Outfall 002 discharge point (DP 002), which is the GSI compliance point, detected 1,4-dioxane at a concentration of 4 ug/L, below the GSI criterion of 280 ug/l.

Based on the analytical data, the 2015 1,4-dioxane exceedances of GSI criteria are limited to the industrial properties immediately downgradient of the Site. 1,4-Dioxane concentrations measured at the Outfall 002 discharge point were below the GSI criterion.

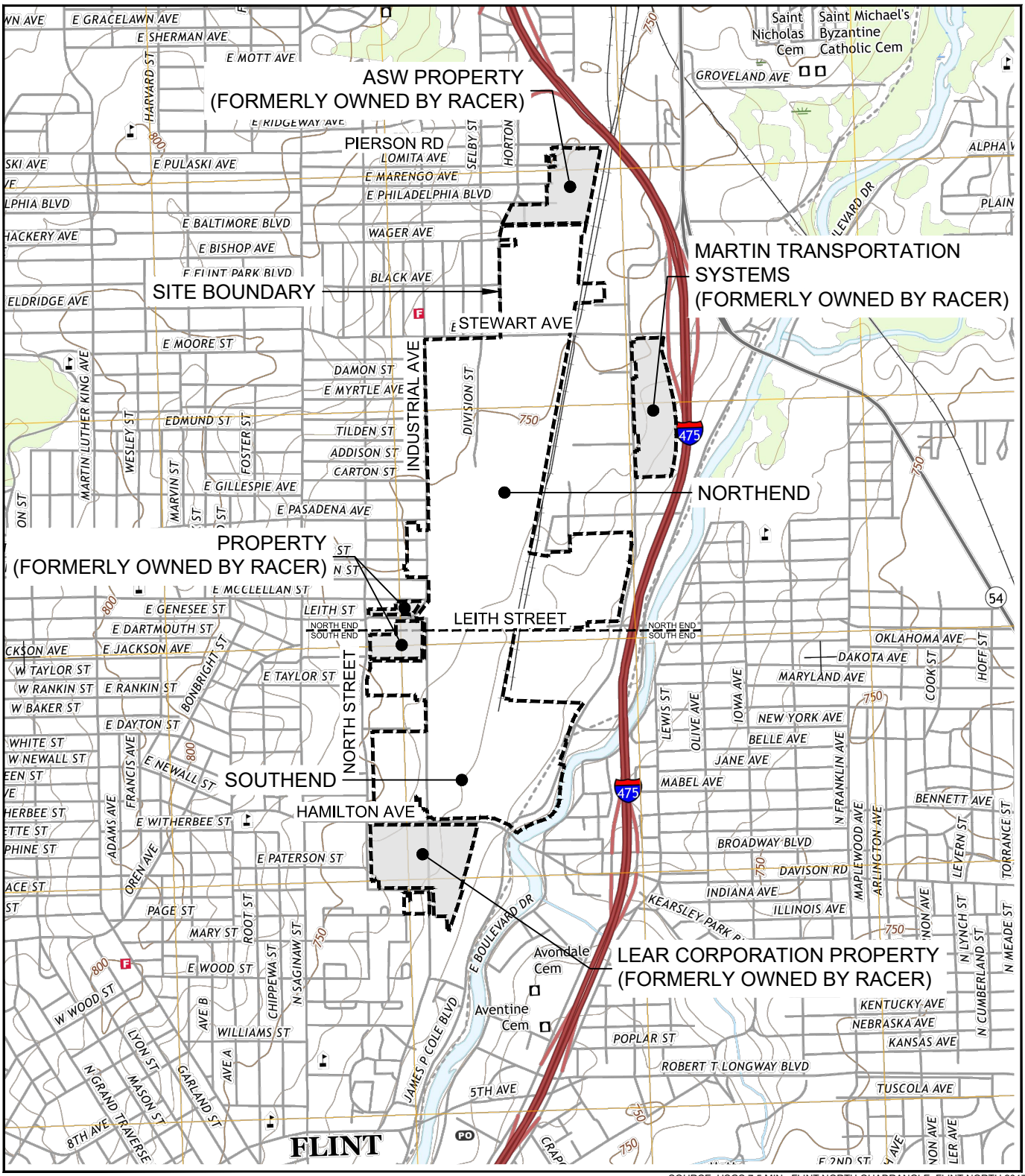
FACTORY 85/86 AREA

As part of the 2019 to 2022 Site investigation activities groundwater samples collected from 13 monitoring wells (87-FP1, 87-FP3, 87-FP5, RFI-83/84-01, RFI-85-04R, RFI-85-05, RFI-86-06S/SR, RFI-86-06DR, 86-100, MW-00-FP7, RFI-81-02, RFI-81-09, and RFI-81-35), four soil borings (SB-86-17, SB-86-18, SB-86-19, and SB-86-20), and two storm sewer features were analyzed for 1,4-dioxane. The storm sewer features included the western P-Trap, which discharges to Outfall 005 and manhole MH 5-4 (**Table 3**). 1,4-Dioxane was not detected above the GSI criterion in any of the samples.

Exceedances previously discussed in the *2018 1,4-Dioxane Investigation Update* Memo (**Attachment A**) at the Factory 85/86 Area detected 1,4-dioxane at concentrations exceeding GSI-H; however, the GSI-H criterion is no longer applicable. Concentrations of 1,4-dioxane do not exceed the applicable GSI criterion of 280 ug/L.

CONCLUSIONS

1,4-Dioxane has been detected at concentrations exceeding the GSI criterion in the Factory 36 and Factory 10 Areas. Samples collected downgradient of the Site and at the Outfall 001 and Outfall 002 discharge points and in the storm sewers do not exceed the GSI criterion. In addition, there is a decreasing trend in 1,4-dioxane concentrations in both areas. The data collected from 2019 to 2022 did not exceed the GSI criterion. 1,4-Dioxane investigation and delineation work is complete at the Site and no additional work is planned.



SOURCE: USGS 7.5 MIN., FLINT NORTH QUADRANGLE, FLINT NORTH 2017

0 2000' 4000'

APPROXIMATE SCALE IN FEET

RACER TRUST
BUICK CITY
FLINT, MICHIGAN

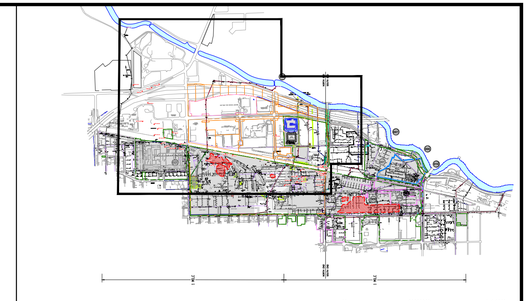
SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

LEGEND:

- PROPERTY BOUNDARY
- PROPERTY PREVIOUSLY OWNED BY RACER
- AREAS WITH NO DIRECT DRAINAGE TO THE STORM SEWER
- SEWER LINE BELOW WATER TABLE
- SEWER LINE BELOW WATER TABLE (LIMITED DATA AVAILABLE)
- SEWER LINE ABOVE WATER TABLE
- SEWER LINE ABOVE WATER TABLE (LIMITED DATA AVAILABLE)
- SEALED STORM SEWER LINE
- INSUFFICIENT DATA AVAILABLE
- 1,4-DIOXANE SAMPLE LOCATION - 11/8 THROUGH 10/22
- 1,4-DIOXANE SAMPLE LOCATION - PRIOR TO 11/8



NOTES:

1. BASE MAP INFORMATION FROM A SURVEY BY BMJ, INC. DATED APRIL 2001, AT A SCALE OF 1:100. AERIAL IMAGE FROM ARCGIS 10 ONLINE MAPPING, ACCESSED 6/12/2013.

0 250' 500'
APPROXIMATE SCALE IN FEET

RACER TRUST
BUICK CITY
FLINT, MICHIGAN

1.4-DIOXANE SAMPLE LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

Table 1
Factory 36 Area 2019-2022 1,4-Dioxane Groundwater Data
RACER Trust, Buick City Site, Flint, Michigan

Location ID: / Date Collected:	Units	GSI	36-FP1 6/17/2020	36-FP4 6/16/2020	36-FP4 10/14/2022	MW-36-40 6/15/2020	MW-36-40 10/12/2022	MW-OS-2 4/28/2022	MW-OS-5 10/14/2020	MW-OS-7 10/14/2020	MW-OS-7 10/14/2022	MW-OS-8 10/14/2020
1,4-Dioxane	ug/L	280 (X)	8	7	9	1 U	1 U	26	1U	13	1.7 J	9

Location ID: / Date Collected:	Units	GSI	MW-OS-8 3/29/2022	MW-OS-9 10/14/2020	MW-OS-9 3/29/2022	RFI-36-08 6/15/2020	RFI-36-08 10/12/2022	RFI-36-18 6/18/2020	RFI-36-18 10/13/2022	RFI-36-19 10/20/2020	RFI-36-37 6/18/2020	RFI-36-43 6/15/2020
1,4-Dioxane	ug/L	280 (X)	1.2 J	6	2	1 U	1 U	8	9	1U	7	1 U

Location ID: / Date Collected:	Units	GSI	RFI-36-43 6/19/2020	RFI-36-43 10/12/2022	RFI-36-44 6/17/2020	RFI-36-44 10/13/2022	RFI-36-55R 10/21/2020	RFI-36-56 11/4/2019	RFI-36-56 10/21/2020
1,4-Dioxane	ug/L	280 (X)	1 U	13 [1 U]	9	1 U	16	1	34

Notes:
GSI - Groundwater/Surface Water Interface Criteria
ug/L - micrograms per liter
U - The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
(X) - The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source.

Table 2 -
Factory 10 Area 2019-2022 1,4-Dioxane Groundwater Data
RACER Trust, Buick City Site, Flint, Michigan

Location ID: Date Collected:	Units	GSI	RFI-10-11 10/20/22	MW-10-24 1/8/2019	RFI-10-26 6/18/2020	RFI-10-26 10/19/2022	SB-10-75 6/12/2020	SB-10-76 6/12/2020
1,4-Dioxane	ug/L	280 (X)	4	1U	1 U	3	1 U	1 U

Notes:
GSI - Groundwater/Surface Water Interface Criteria
ug/L - micrograms per liter
U - The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
(X) - The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source.

Table 3
Factory 85/86 Area 2018 - 2022 1,4-Dioxane Groundwater Data
RACER Trust, Buick City Site, Flint, Michigan

Location ID: / Date Collected:	Units	GSI	87-FP1 11/12/2018	87-FP3 10/19/2022	87-FP5 11/12/2018	87-FP5 10/19/2022	RFI-83/84-01 11/12/2018	RFI-85-04R 11/12/2018	RFI-85-05 11/12/2018	RFI-86-06S 11/12/2018	RFI-86-06SR 10/20/2022	RFI-86-06DR 10/20/2022
1,4-Dioxane	ug/L	280 (X)	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1	2 [2]

Location ID: / Date Collected:	Units	GSI	WPTrap 11/12/2018	MH 5-4 11/12/2018	86-100 6/15/2020	86-100 10/20/2022	MW-00-FP7 6/18/2020	MW-00-FP7 10/21/2022	RFI-81-02 6/17/2020	RFI-81-09 6/15/2020	RFI-81-35 6/15/2020	SB-86-17 6/11/2020
1,4-Dioxane	ug/L	280 (X)	1 U [1 U]	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

Location ID: / Date Collected:	Units	GSI	SB-86-18 6/11/2020	SB-86-19 6/12/2020	SB-86-20 6/11/2020
1,4-Dioxane	ug/L	280 (X)	1 U	1 U	3

Notes:
GSI - Groundwater/Surface Water Interface Criteria
ug/L - micrograms per liter
U - The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
(X) - The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source.

Attachment A

MEMO

ARCADIS Design & Consultancy for natural and built assets

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From:

Micki Maki

Date:

November 13, 2018

Arcadis Project No.:

B0064410.2018

Subject:

1,4-Dioxane Investigation Update
RACER Trust, Buick City, Flint, Michigan

This memo was prepared by Arcadis of Michigan, LLC (Arcadis) to provide an update on the status of 1,4-dioxane investigations completed at the Buick City Site (Site), located in Flint, Michigan (**Figure 1**).

1,4-Dioxane investigation activities began at the Site in 2015. Forty-six monitoring wells where 1,1,1-trichloroethane (1,1,1-TCA) had previously been detected were selected for sampling as part of the initial Site screening for 1,4-dioxane (**Table 1**). 1,4-Dioxane was not detected in any of the 12 monitoring wells sampled at the Southend of the Site; therefore, no additional investigation for 1,4-dioxane has been completed at the Southend. 1,4-Dioxane was detected above residential and/or nonresidential drinking water (RDW/NDW) criteria in 11 groundwater samples collected at the Northend of the Site, primarily located at the Factory 36 Area, Factory 10 Area and Factory 85/86 Areas of the Site. Additional sampling and investigation activities conducted in these areas are summarized below.

1. FACTORY 36 AREA

The 1,4-dioxane investigation at the Factory 36 area of the Site includes the following events from 2015 through 2018.

- A mass flux and vertical aquifer profiling (VAP) investigation was completed downgradient of the Factory 36 Area to further characterize the nature and extent of off-site groundwater concentrations of 1,4-dioxane. The goal of this investigation was to map the hydrostratigraphy and groundwater impacts at high-resolution, to identify the preferential flow paths, and to determine the strength of associated off-site contaminant plume migration. Two transects were completed to map the migration of the 1,4-dioxane impacts (Transect 1 [Dec 2015] and Transect 3 [May 2016]) downgradient of the Site.
- Water samples were collected from select manholes along the Outfall 001 storm sewer which is downgradient of the Factory 36 Area (September 2016, February 2017, and June 2017),
- Groundwater samples and gauging data were collected from existing monitoring wells (2015-2018), and
- Groundwater samples and gauging data were collected from newly installed monitoring wells MW-OS-1 through MW-OS-9 (2017-2018).

Newly installed monitoring wells MW-OS-1, MW-OS-2, and MW-OS-3, were co-located with Transect 3 vertical aquifer profile (VAP) groundwater sampling locations OST-3-8, OST3-3, and OST3-5, which represent the northernmost, highest and southernmost exceedances of the residential drinking water (RDW) 1,4 dioxane criteria, respectively. These wells were installed to aid in determining the direction of groundwater flow in the area, to further assess 1,4-dioxane concentrations and to provide permanent monitoring points. Monitoring wells MW-OS-4 through -6 were installed downgradient of Transect 3 on the north (MW-OS-4) and south (MW-OS-5 and MW-OS-6) sides of the Outfall 001 storm sewer. These wells were installed to aid in determining the direction of groundwater flow in the area, to confirm that 1,4-dioxane is not present north of the Outfall 001 storm sewer, and to determine if 1,4-dioxane was present along the south side of the Outfall 001 storm sewer. Monitoring wells MW-OS-7 through -9 are installed to continue delineation downgradient of Transect 3 along Dort Highway. All 1,4-dioxane sampling locations in the Factory 36 Area are shown on **Figure 2**.

1.1 FACTORY 36 DATA EVALUATION

This Factory 36 data evaluation includes a comparison to applicable criteria for 1,4-dioxane. Applicable criteria for this evaluation include the groundwater/surface water interface surface water human drinking value (GSI-H) of 3.5 micrograms per liter (ug/L), the residential drinking water (RDW) criterion of 7.2ug/L, and the nonresidential drinking water (NDW) criterion of 350 ug/L. Please note that the GSI-H criteria was lowered from 34 ug/L to 3.5 ug/L on June 25, 2018.

The Outfall 001 drainage area services the area downgradient of Factory 36 and the discharge point is located approximately 1,600 feet upgradient of the intake for the water treatment plant.

Figure 2 presents a color-coded summary of the 1,4-dioxane data collected from 2015 through 2018 at the Factory 36 Area. The 1,4-dioxane data are represented on the figure as follows:

- Red – One or more samples collected from this location exceed the GSI-H, RDW, and/or NDW criteria.
- Green – Samples collected from this location did not detect 1,4-dioxane at concentrations above the applicable criteria.

1.1.1 Transect Vertical Aquifer Profiling Samples

Table 2 presents the 1,4-dioxane data for the VAP groundwater grab samples collected from Transects 1 and 3. Along Transect 1 the shallowest sample collected at each profiling locations, with the exception of OST-1-4, was below criteria; however, deeper samples collected from each location exceeded GSI-H and RDW criteria. Results were similar along Transect 3 with the following exceptions. 1) The results from all three samples collected at OST-3-3 exceeded GSI-H and RDW criteria and 2) none of the samples collected from the two southernmost borings (OST-3-6 and OST-3-7) exceeded criteria.

1.1.2 Existing Monitoring Well Samples

Table 3 presents the 1,4-dioxane data collected from monitoring wells at and downgradient of the Factory 36 Area of the Site. As shown on **Figure 2**, 1,4- dioxane was detected above criteria in one on-Site well (36-FP1) and seven monitoring wells located immediately downgradient of the Site. In addition, samples collected from the three monitoring wells (MW-OS-1 through MW-OS-3) collocated with Transect 3 and the three monitoring wells downgradient of Transect 3 (MW-OS-7 through MW-OS-9) all exceed GSI-H and/or RDW criteria. However, samples collected from downgradient monitoring wells MW-OS-4. MW-OS-5 and MW-OS-6 did not exceed criteria.

1.1.3 Outfall 001 Storm Sewer Samples

Table 4 presents the 1,4-dioxane results of 12 samples collected from the Outfall 001 storm sewer during two events. Samples were collected from the discharge point to the Flint River (DP001) and at select manhole locations downgradient of the Site property boundary. At least one sample collected from each location exceeded the GSI-H criteria with the exception of the samples collected from manhole MH 1-3. Neither sample collected from MH 1-3, which is located at the ASW downgradient property boundary, exceeded criteria. The two samples collected from the discharge point (which is the GSI-H compliance point) detected 1,4-dioxane at concentrations of 6 ug/l and 4 ug/L.

1.2 FACTORY 36 SUMMARY

Groundwater in the Factory 36 Area exceeds both the GSI-H and RDW/NDW drinking water criteria. Although 1,4-dioxane concentrations measured at the Outfall 001 discharge point were above the GSI-H

criterion, assuming normal flow and mixing zone considerations, the level of 1,4-dioxane (4 to 6 ug/L) would be less than the criteria (3.5 ug/L) at the water plant intake point.

Based on the analytical data, the 1,4-dioxane exceedances of RDW/NDW criteria are limited to the area south of the Outfall 001 storm sewer and are unlikely to reach the Flint River via direct discharge. In addition, there are no known drinking water receptors in the area south of the Outfall 001 storm sewer.

2. FACTORY 10 AREA

The 1,4-dioxane investigation at the Factory 10 Area of the Site includes the following events from 2015 through 2018:

- Groundwater grab samples and potentiometric surface data collected from off-Site Transect 2 (Dec 2015) and Transect 4 (May 2016) during the VAP investigation,
- Water sample collected from Outfall 002 discharge point to the river. Outfall 002 is located downgradient of the Factory 10 Area (September 2016),
- Groundwater samples collected from existing monitoring wells (2015-2018), and
- Groundwater samples collected from newly installed monitoring wells MW-10-22 and MW-10-23 (2018).

Newly installed (2018) monitoring wells MW-10-22 and MW-10-23 were installed southeast of Transect 4 to confirm the delineation of impacts downgradient of the Site. One additional well (MW-10-24) is planned to be installed in the vicinity of GM-6 (**Figure 2**) later this year to complete downgradient delineation. All 1,4-dioxane sampling locations in the Factory 10 Area are presented on **Figure 2**.

2.1 FACTORY 10 DATA EVALUATION

This Factory 10 data evaluation includes a comparison to applicable criteria for 1,4-dioxane. Applicable criteria include GSI-H, RDW, and NDW criteria. Please note that the GSI-H criteria was lowered from 34 ug/L to 3.5 ug/L on June 25, 2018. The Outfall 002 drainage area services the area downgradient of Factory 10. Outfall 002 discharges to the Flint River more than 2,000 feet downgradient of the intake for the water treatment plant.

Figure 2 presents a color-coded summary of the 1,4-dioxane data collected from 2015 through 2018 at the Factory 10 Area. The 1,4-dioxane data are represented on the figure as follows:

- Red – One or more samples collected from this location exceed the GSI-H, RDW, and/or NDW criteria.
- Green – Samples collected from this location did not detect 1,4-dioxane at concentrations above criteria.

2.1.1 Transect Vertical Aquifer Profiling Samples

Table 5 presents the 1,4-dioxane data for the VAP groundwater grab samples collected from Transects 2 and 4. Along Transect 2, samples from the two northern most locations (OST2-1 and OST2-2) were below criteria, while the remaining locations had one or more samples that exceeded GSI-H, RDW and/or NDW criteria. Similar to what was seen in the samples at Transects 1 and 3, the highest concentrations of 1,4-dioxane were detected in the deepest samples. Due to the soil characteristics along Transect 4, limited groundwater samples were able to be collected. None of the groundwater samples collected from Transect 4 detected 1,4-dioxane.

2.1.2 Existing Monitoring Well Samples

Table 6 presents the 1,4-dioxane data collected from monitoring wells at and downgradient of the Factory 10 Area of the Site. As shown on **Figure 2**, 1,4- dioxane was detected above criteria in two on-Site wells (RFI-10-03 and RFI-10-11) and three monitoring wells located immediately downgradient of the Site. However, samples collected from downgradient monitoring wells MW-10-22 and MW-10-23 do not exceed criteria.

2.1.3 Outfall 002 Storm Sewer Sample

Table 7 presents the 1,4-dioxane result of the one sample collected from the Outfall 002 discharge point (DP002). The sample collected from the discharge point (which is the GSI-H compliance point) detected 1,4-dioxane at a concentration of 4 ug/L.

2.2 FACTORY 10 SUMMARY

Groundwater in the Factory 10 Area exceeds both the GSI-H and RDW/NDW drinking water criteria. Although 1,4-dioxane concentrations measured at the Outfall 002 discharge point were above the GSI-H criterion, the level of 1,4-dioxane (4 to 6 ug/L) would be less than the criteria (3.5 ug/L) at the water plant intake point. Impacts in groundwater located downgradient of the Site have been partially delineated with delineation activities ongoing to confirm that potentially adverse impacts do not reach the Flint River via direct discharge.

Based on the analytical data, the 1,4-dioxane exceedances of RDW/NDW criteria are limited to the industrial properties immediately downgradient of the Site. Impacts have been partially delineated with delineation activities ongoing to confirm that impacts do not reach the Flint River via direct discharge.

3. FACTORY 85/86 AREA

The 1,4-dioxane investigation at the Factory 85/86 Area of the Site includes the following events from 2015 through 2018.

- Groundwater samples collected from existing monitoring wells (2015-2018), and
- Water samples collected from Outfall 005 manhole MH 5-4 prior to and following bulkheading activities at Outfall 004 (2017-2018).

The 1,4-dioxane sampling locations in the Factory 85/86 Area are presented on **Figure 3**.

3.1 FACTORY 85/86 DATA EVALUATION

This Factory 85/86 data evaluation includes a comparison to GSI-H and RDW/NDW criteria for 1,4-dioxane. The Outfall 005 drainage area services the Factory 85/86 Area. Outfall 005 discharges to the Flint River more than 3,000 feet downgradient of the intake for the water treatment plant.

Figure 3 presents a color-coded summary of the 1,4-dioxane data collected from 2015 through 2018 at the Factory 85/86 Area. The 1,4-dioxane data are represented on the figure as follows:

- Red – One or more samples collected from this location exceed the GSI-H, RDW, and/or NDW criteria.
- Green – Samples collected from this location did not detect 1,4-dioxane at concentrations above criteria.

3.1.1 Existing Monitoring Well Samples

Table 8 presents the 1,4-dioxane data collected from monitoring wells at and downgradient of the Factory 85/86 Area of the Site. As shown on **Figure 3**, 1,4- dioxane was detected above criteria in four on-Site wells. However, samples collected from downgradient and side gradient monitoring wells do not exceed criteria.

3.1.2 Outfall 005 Storm Sewer Samples

Table 9 presents the 1,4-dioxane results of the samples collected from the Outfall 005 manhole MH 5-4. These samples were collected prior to and following bulkheading activities conducted at Outfall 004 to confirm that these activities did not change the quality of the groundwater infiltrating the Outfall 005 storm sewer. 1,4-Dioxane was not detected in these samples. In addition, samples were collected from a drainage feature (WPTRAP), which collects water from behind the Leith Street retaining wall and discharges it to the Outfall 005 storm sewer. 1,4-Dioxane has not been detected in these samples.

3.2 FACTORY 85/86 SUMMARY

The 1,4-dioxane exceedances of GSI-H and RDW criteria have been delineated on-Site and do not appear to have a complete direct discharge pathway to the Flint River. In addition, samples collected from the Outfall 005 storm sewer did not detect 1,4-dioxane.

4. CONCLUSIONS

1,4-Dioxane has been detected at concentrations exceeding GSI-H and RDW/ in the Factory 36, Factory 10 and Factory 85/86 Areas. At Factory 36 exceedances of GSI-H and RDW criteria have not yet been delineated. Although 1,4-dioxane concentrations measured at the Outfall 001 discharge point were above the GSI-H criterion, the level of 1,4-dioxane (4 to 6 ug/L) would be less than the criteria (3.5 ug/L) at the water plant intake point. In addition, there are no known drinking water receptors in the area south of the Outfall 001 storm sewer. Delineation activities will be completed downgradient of the Site.

At Factory 10 groundwater exceeds both the GSI-H and RDW/NDW drinking water criteria. Although 1,4-dioxane concentrations measured at the Outfall 002 discharge point were above the GSI-H criterion, the level of 1,4-dioxane (4 to 6 ug/L) would be less than the criteria (3.5 ug/L) at the water plant intake point. Impacts in groundwater located downgradient of the Site have been partially delineated with delineation activities ongoing to confirm that impacts do not reach the Flint River via direct discharge.

At Factory 85/86 GSI-H and RDW/NDW impacts are delineated on-Site neither pathway appears to be complete

Table 1. 2015 Initial 1,4-Dioxane Sampling Event Data
RACER Trust, Buick City Site, Flint, Michigan

Location ID:		03-105R3	04-02	20-102	20-105R	30-100	43-101R	55-2	87-FP2	87-FP3	87-FP4
Date Collected:	Units	03/27/15	03/19/15	03/20/15	03/19/15	03/27/15	03/25/15	03/25/15	03/25/15	03/19/15	03/25/15
Volatile Organics											
1,4-Dioxane	ug/L	5 U	5 U	5 U	5 U	**5 (GSI-H)**	5 U [5 U]	**15 (GSI-H, RDW)**	**7 (GSI-H)**	5 U	5 U

Location ID:		MW-10-14	RFI-02-20	RFI-09-04R	RFI-09-53	RFI-10-03	RFI-10-11	RFI-10-24	RFI-10-26	RFI-10-32	RFI-10-33
Date Collected:	Units	03/20/15	04/01/15	03/19/15	03/19/15	03/31/15	03/19/15	03/18/15	03/19/15	03/18/15	03/18/15
Volatile Organics											
1,4-Dioxane	ug/L	**37 (GSI-H, RDW)**	5 U	5 U [5 U]	5 U	**1,600 Y (GSI,NDW,RDW)**	**165 (GSI-H, RDW)**	5 U	5 U	**136(GSI-H, RDW)**	5 U

Location ID:		RFI-12-27	RFI-12-34	RFI-36-03	RFI-36-37	RFI-36-43	RFI-36-44	RFI-36-46	RFI-36-47R	RFI-36-55	RFI-40-09
Date Collected:	Units	04/01/15	04/01/15	03/19/15	03/31/15	03/31/15	03/18/15	03/19/15	03/31/15	03/18/15	03/20/15
Volatile Organics											
1,4-Dioxane	ug/L	5 U	5 U	5 U	**13 (GSI-H, RDW)**	5 U	**19 (GSI-H, RDW)**	5 U	5 U	**26(GSI-H, RDW)**	5 U

Location ID:		RFI-55-01	RFI-55-09	RFI-65-01	RFI-81-08	RFI-81-11	RFI-81-39R	RFI-81-49	RFI-81-51	RFI-84-06R	RFI-84-09S
Date Collected:	Units	03/31/15	03/27/15	03/27/15	03/20/15	03/31/15	03/27/15	03/27/15	03/20/15	03/19/15	03/19/15
Volatile Organics											
1,4-Dioxane	ug/L	5 U	5 U	5 U	5 U	5 U	**46 (GSI-H,RDW) [42 (GSI-H,RDW)]**	5 U	**6 (GSI-H)**	5 U	5 U

Location ID:		RFI-84-11S	RFI-86-05	RFI-86-06S	RFI-86-08R	RFI-94-02R	RFI-94-10
Date Collected:	Units	03/19/15	03/19/15	03/18/15	03/19/15	03/19/15	03/20/15
Volatile Organics							
1,4-Dioxane	ug/L	5 U [5 U]	**26 (GSI-H, RDW)**	5 U	**182 (GSI-H, RDW)**	5 U	5 U

Notes:
GSI-H - 2018 Groundwater-surface water interface - human drinking value of 3.5 ug/L
RDW/NDW - Residential Drinking Water/Nonresidential Drinking Water criteria of 7.2 and 350 ug/L, respectively
Bolded and shaded results exceeds one or more criteria
ug/L - micrograms per liter
U - Analyte not detected above the reporting limit
Y - Elevated reporting limit due to high target concentrations

Table 2. 2015- 2016 Factory 36 Transect Vertical Aquifer Profiling Data
RACER Trust, Buick City Site, Flint, Michigan

Location ID:		OST 1-1	OST 1-1	OST 1-1	OST 1-2	OST 1-2	OST 1-2	OST 1-3	OST 1-3
Sample Depth(ft):		9 - 12	12 - 15	16 - 19	8 - 11	11 - 14	15 - 18	6 - 9	10.5 - 13.5
Date Collected:	Units	12/22/15	12/22/15	12/22/15	12/22/15	12/22/15	12/22/15	12/22/15	12/22/15
Volatile Organics									
1,4-Dioxane	ug/L	3	**23 (GSI-H,RDW)**	**230 Y (GSI-H,RDW)**	3 U	**7 (GSI-H)**	**81 (GSI-H, RDW)**	3 U	**6 (GSI-H)**

Location ID:		OST 1-3	OST 1-4	OST 1-4	OST 1-4	OST 1-7	OST 1-7	OST 1-7	OST 1-8
Sample Depth(ft):		15 - 18	9 - 12	13 - 16	17 - 20	10 - 13	14 - 17	17 - 20	11 - 14
Date Collected:	Units	12/22/15	12/21/15	12/21/15	12/21/15	12/22/15	12/22/15	12/22/15	12/23/15
Volatile Organics									
1,4-Dioxane	ug/L	**68 (GSI-H, RDW)**	**7 (GSI-H)**	**40 (GSI-H, RDW) [38 (GSI-H, RDW)]**	**168 (GSI-H,RDW)**	3 U	**17 (GSI-H,RDW)**	**209 (GSI-H, RDW)**	3 U

Location ID:		OST 1-8	OST 1-8	OST 3-1	OST 3-1	OST 3-1	OST 3-2	OST 3-2	OST 3-2
Sample Depth(ft):		15 - 18	19 - 22	13.5 - 17	17 - 20.5	20.5 - 22.5	13.5 - 17	17 - 20.5	20.5 - 24
Date Collected:	Units	12/23/15	12/23/15	05/25/16	05/25/16	05/25/16	06/02/16	06/02/16	06/02/16
Volatile Organics									
1,4-Dioxane	ug/L	**16 (GSI-H, RDW)**	**67 (GSI-H, RDW)**	3 U	**13 (GSI-H, RDW)**	**77 (GSI-H, RDW)**	3 U	**33 (GSI-H, RDW)**	**45 (GSI-H, RDW)**

Location ID:		OST 3-3	OST 3-3	OST 3-3	OST 3-4	OST 3-4	OST 3-4	OST 3-5	OST 3-5
Sample Depth(ft):		12 - 15.5	15.5 - 19	19 - 22.5	13.5 - 17	17 - 20.5	20.5 - 24	14 - 17.5	17.5 - 21
Date Collected:	Units	05/25/16	05/25/16	05/25/16	06/02/16	06/02/16	06/02/16	05/25/16	05/25/16
Volatile Organics									
1,4-Dioxane	ug/L	**14 (GSI-H, RDW)**	**31 (GSI-H, RDW)**	**146 (GSI-H, RDW) [135 (GSI-H, RDW)]**	3 U	**8 (GSI-H, RDW)**	3 U	3 U	3 U

Location ID:		OST 3-5	OST 3-6	OST 3-6	OST 3-7	OST 3-7	OST 3-8	OST 3-8
Sample Depth(ft):		21.5 - 25	16.5 - 20	20.5 - 24	21 - 24.5	24.5 - 27	13.5 - 17	17.5 - 21
Date Collected:	Units	05/25/16	06/02/16	06/02/16	05/25/16	05/25/16	06/02/16	06/02/16
Volatile Organics								
1,4-Dioxane	ug/L	**92 (GSI-H, RDW)**	3 U	3	3 U	3 U	3 U	**24 (GSI-H, RDW) [24 (GSI-H, RDW)]**

Notes:
GSI-H - 2018 Groundwater-surface water interface - human drinking value
RDW - Residential Drinking Water
Bolded and shaded results exceed one or more criteria
ug/L - micrograms per liter
U - Analyte not detected above the reporting limit
Y - Elevated reporting limit due to high target concentrations

Table 3. 2015 -2018 Factory 36 Monitoring Well 1,4-Dioxane Groundwater Data
RACER Trust, Buick City Site, Flint, Michigan

Location ID:		36-FP1	36-FP1	MW-OS-1	MW-OS-1	MW-OS-2	MW-OS-2	MW-OS-3
Date Collected:	Units	11/02/16	10/19/17	04/03/17	08/10/17	04/03/17	08/10/17	04/03/17
Volatile Organics								
1,4-Dioxane	ug/L	**112 (GSI-H, RDW)**	**290 (GSI-H, RDW)**	**38 (GSI-H, RDW)**	**23 (GSI-H, RDW)**	**34 (GSI-H, RDW) [91 (GSI-H, RDW)]**	**36 (GSI-H, RDW)**	**12 (GSI-H, RDW)**

Location ID:		MW-OS-3	MW-OS-4	MW-OS-4	MW-OS-5	MW-OS-5	MW-OS-6	MW-OS-6
Date Collected:	Units	08/10/17	03/06/18	09/17/18	04/03/17	10/09/17	04/03/17	10/09/17
Volatile Organics								
1,4-Dioxane	ug/L	**53 (GSI-H, RDW)**	1 U	1 U	3 U	3 U	3 U	3 U

Location ID:		MW-OS-7	MW-OS-7	MW-OS-8	MW-OS-8	MW-OS-9	MW-OS-9	RFI-36-03
Date Collected:	Units	03/06/18	09/17/18	03/05/18	09/17/18	03/05/18	09/17/18	03/19/15
Volatile Organics								
1,4-Dioxane	ug/L	1 U	**6 (GSI-H)**	**13 (GSI-H, RDW)**	**4 (GSI-H)**	1 U	**4 (GSI-H)**	5 U

Location ID:		RFI-36-17	RFI-36-17	RFI-36-18	RFI-36-18	RFI-36-18	RFI-36-37	RFI-36-43
Date Collected:	Units	09/24/15	10/28/16	09/24/15	10/28/16	10/20/17	03/31/15	03/31/15
Volatile Organics								
1,4-Dioxane	ug/L	**33 (GSI-H, RDW)**	**30 (GSI-H, RDW)**	3 U	**121 (GSI-H, RDW)**	**66 (GSI-H, RDW)**	**13 (GSI-H, RDW)**	5 U

Location ID:		RFI-36-44	RFI-36-44	RFI-36-44	RFI-36-44	RFI-36-46	RFI-36-47R	RFI-36-48
Date Collected:	Units	03/18/15	09/24/15	10/28/16	10/20/17	03/19/15	03/31/15	09/24/15
Volatile Organics								
1,4-Dioxane	ug/L	**19 (GSI-H, RDW)**	**31 (GSI-H, RDW) [32 (GSI-H, RDW)]**	**90 (GSI-H, RDW)**	**130 (GSI-H, RDW)**	5 U	5 U	6 UB

Location ID:		RFI-36-48	RFI-36-48	RFI-36-53	RFI-36-53	RFI-36-53	RFI-36-55	RFI-36-55R
Date Collected:	Units	10/28/16	10/20/17	09/24/15	10/28/16	10/20/17	03/18/15	09/24/15
Volatile Organics								
1,4-Dioxane	ug/L	3 U	3 U	**102 (GSI-H, RDW)**	**61 (GSI-H, RDW) [38 (GSI-H, RDW)]**	**49 (GSI-H, RDW)**	**26 (GSI-H, RDW)**	**44 (GSI-H, RDW)**

Location ID:		RFI-36-55R	RFI-36-55R	RFI-36-56	RFI-36-56	RFI-36-56
Date Collected:	Units	10/28/16	10/20/17	09/23/15	10/28/16	10/20/17
Volatile Organics						
1,4-Dioxane	ug/L	**20 (GSI-H, RDW)**	**35 J (GSI-H, RDW)**	**22 (GSI-H, RDW)**	**114 (GSI-H, RDW)**	**134 (GSI-H, RDW) [125 (GSI-H, RDW)]**

Notes:
GSI-H - 2018 Groundwater-surface water interface - human drinking value
RDW - Residential Drinking Water criteria
Bolded and shaded results exceed one or more criteria.
ug/L - micrograms per liter
U - Analyte not detected above the reporting limit
Y - Elevated reporting limit due to high target concentrations

Table 4. 2015 -2018 Factory 36 Outfall 001 Storm Sewer Sample Data
RACER Trust, Buick City Site, Flint, Michigan

Location ID:			DP001	DP001	MH-1-1	MH1-1	MH1-1	MH1-1-3
Sample Depth():								
Date Collected:	GSI-H	Units	02/09/17	06/08/17	09/20/16	02/09/17	06/08/17	02/09/17
1,4-Dioxane	3.5	ug/L	**6 (GSI-H)**	**4 (GSI-H)**	**8 (GSI-H)[8 (GSI-H)]**	**5 (GSI-H) [6 (GSI-H)]**	**4 (GSI-H)[4 (GSI-H)]**	3 U

Location ID:			MH1-1-3	MH1-1-6	MH1-1-9	MH1-1-9	MH1-3	MH1-3
Sample Depth():								
Date Collected:	GSI-H	Units	06/08/17	06/08/17	02/09/17	06/08/17	02/09/17	06/08/17
1,4-Dioxane	3.5	ug/L	**5(GSI-H)**	**6 (GSI-H)**	**4(GSI-H)**	3 U	3 U	3 U

Notes:
GSI-H - 2018 Groundwater-surface water interface - human drinking value
Bolded and shaded results exceed the criterion
ug/L - micrograms per liter
U - Analyte not detected above the reporting limit

Table 5. 2015- 2016 Factory 10 Transect Vertical Aquifer Profiling Data
RACER Trust, Buick City Site, Flint, Michigan

Location ID:		OST 2-1	OST 2-1	OST 2-1	OST 2-2	OST 2-2	OST 2-2
Sample Depth(ft):		10 - 13	15 - 18	18 - 20	8 - 11	11 - 14	14 - 17
Date Collected:	Units	12/16/15	12/16/15	12/15/15	12/16/15	12/16/15	12/16/15
1,4-Dioxane	ug/L	3 U	3 U	3 U	3 U	3 U	3 U

Location ID:		OST 2-2	OST 2-3	OST 2-3	OST 2-3	OST 2-4	OST 2-4
Sample Depth(ft):		17 - 20	9 - 12	13 - 16	16 - 19	8 - 11	11 - 14
Date Collected:	Units	12/16/15	12/17/15	12/17/15	12/17/15	12/18/15	12/18/15
1,4-Dioxane	ug/L	3 U	3	**41 (GSI-H, RDW)**	**39 (GSI-H, RDW)**	**7 (GSI-H)**	**28 (GSI-H, RDW)**

Location ID:		OST 2-4	OST 2-5	OST 2-5	OST 2-6	OST 2-6	OST 2-7
Sample Depth(ft):		14 - 17	9 - 12	12 - 15	9 - 12	12 - 15	7 - 10
Date Collected:	Units	12/18/15	12/18/15	12/18/15	12/18/15	12/18/15	12/18/15
1,4-Dioxane	ug/L	**8 (GSI-H, RDW)**	3 U	**36 (GSI-H, RDW)**	**17 (GSI-H, RDW)**	**53 (GSI-H, RDW)**	**43 (GSI-H, RDW)**

Location ID:		OST 2-7	OST 2-8	OST 2-8	OST 2-9	OST 2-9	OST 2-10
Sample Depth(ft):		10 - 13	9 - 12	12.5 - 15.5	9.5 - 12.5	14 - 17	10 - 13
Date Collected:	Units	12/18/15	12/21/15	12/21/15	12/21/15	12/21/15	12/21/15
1,4-Dioxane	ug/L	**66 (GSI-H, RDW)**	**39 (GSI-H, RDW)**	**450 Y (GSI-H,RDW, NDW) [470 Y (GSI-H,RDW, NDW)]**	**21 (GSI-H, RDW)**	**101 (GSI-H, RDW)**	**4 (GSI-H)**

Location ID:		OST 2-10	OST 2-11	OST 4-2	OST 4-3	OST 4-4	OST 4-5
Sample Depth(ft):		14 - 17	13 - 16	3 - 13		6.6 - 11.6	
Date Collected:	Units	12/21/15	12/21/15	06/06/16	05/31/16	06/06/16	05/31/16
1,4-Dioxane	ug/L	**21 (GSI-H, RDW)**	**15 (GSI-H, RDW)**	3 U	3 U	3 U	3 U [3 U]

Location ID:		OST 4-6	OST 4-7	OST 4-8	OST 4-9
Sample Depth(ft):		2 - 7		5 - 10	
Date Collected:	Units	06/06/16	05/31/16	06/06/16	06/01/16
1,4-Dioxane	ug/L	3 U	3 U	3 U [3 U]	3 U

Notes:
GSI-H - 2018 Groundwater-surface water interface - human drinking value
RDW - Residential Drinking Water criteria
Bolded and shaded results exceed one or more criteria.
ug/L - micrograms per liter
U - Analyte not detected above the reporting limit
Y - Elevated reporting limit due to high target concentrations

Table 6. 2015 -2018 Factory 10 Monitoring Well 1,4-Dioxane Groundwater Data
RACER Trust, Buick City Site, Flint, Michigan

Location ID:		20-102	20-105R	MW-10-14	MW-10-22	MW-10-22	MW-10-23
Sample Depth():							
Date Collected:	Units	03/20/15	03/19/15	03/20/15	03/05/18	09/18/18	03/05/18
Volatile Organics							
1,4-Dioxane	ug/L	5 U	5 U	**37 (GSI-H, RDW)**	1 U [1 U]	1 U	1 U

Location ID:		MW-10-23	RFI-10-03	RFI-10-03	RFI-10-03	RFI-10-03	RFI-10-11
Date Collected:	Units	09/18/18	03/31/15	09/24/15	10/27/16	10/19/17	03/19/15
Volatile Organics							
1,4-Dioxane	ug/L	1 U	**1,600 Y (GSI-H,NDW,RDW)**	**1,686 (GSI-H,NDW,RDW)**	**700 Y (GSI-H,NDW,RDW)**	**480 (GSI-H,NDW,RDW)**	**165 (GSI-H, RDW)**

Location ID:		RFI-10-11	RFI-10-11	RFI-10-11	RFI-10-24	RFI-10-26	RFI-10-32
Date Collected:	Units	09/24/15	10/27/16	10/19/17	03/18/15	03/19/15	03/18/15
Volatile Organics							
1,4-Dioxane	ug/L	**246 (GSI-H, RDW)**	**80 (GSI-H, RDW)**	**6 (GSI-H)**	5 U	5 U	**136 (GSI-H, RDW)**

Location ID:		RFI-10-32	RFI-10-32	RFI-10-32	RFI-10-33	RFI-10-34	RFI-10-34
Date Collected:	Units	09/24/15	10/28/16	10/20/17	03/18/15	09/24/15	10/20/17
Volatile Organics							
1,4-Dioxane	ug/L	**158 J (GSI-H, RDW)**	**146 (GSI-H, RDW)**	**105 (GSI-H, RDW) [115 (GSI-H, RDW)]**	5 U	3 UJ	3 U

Location ID:		RFI-10-35	RFI-10-35	RFI-10-35	RFI-10-36	RFI-10-36	RFI-10-36
Date Collected:	Units	09/24/15	10/27/16	10/19/17	09/24/15	10/27/16	10/20/17
Volatile Organics							
1,4-Dioxane	ug/L	**21 (GSI-H, RDW)**	**27 (GSI-H, RDW) [30 (GSI-H, RDW)]**	**10 (GSI-H, RDW)**	3 U	**28 (GSI-H, RDW)**	3 U [3 U]

Location ID:		RFI-81-08	RFI-81-11	RFI-81-12R	RFI-81-39R	RFI-81-49	RFI-81-51
Date Collected:	Units	03/20/15	03/31/15	09/24/15	03/27/15	03/27/15	03/20/15
Volatile Organics							
1,4-Dioxane	ug/L	5 U	5 U	3 U	**46 (GSI-H, RDW) [42 (GSI-H, RDW)]**	5 U	**6 (GSI-H)**

Notes:
GSI-H - 2018 Groundwater-surface water interface - human drinking value
RDW - Residential Drinking Water criteria
NDW - Nonresidential Drinking Water criteria
Bolded and shaded results exceed one or more criteria.
ug/L - micrograms per liter
U - Analyte not detected above the reporting limit
Y - Elevated reporting limit due to high target concentrations

Table 7. 2016 Outfall 002 Storm Sewer Data
RACER Trust, Buick City Site, Flint, Michigan

Location ID: / Date Collected:	Units	DP002 09/20/16
1,4-Dioxane	ug/L	**4 (GSI-H)**

Notes:
GSI-H - 2018 Groundwater-surface water interface - human drinking value
Bolded and shaded results exceed one or more criteria.
ug/L - micrograms per liter

Table 8. 2015-2018 Factory 85/86 Monitoring Well 1,4-Dioxane Groundwater Data
RACER Trust, Buick City Site, Flint, Michigan

Location ID: / Date Collected:	Units	87-FP1 08/31/17	87-FP1 10/09/17	87-FP1 07/30/18	87-FP2 03/25/15	87-FP3 03/19/15	87-FP3 10/18/17	87-FP4 03/25/15	87-FP5 10/09/17
1,4-Dioxane	ug/L	3 U	3 U	1 U	**7 (GSI-H)**	5 U	3 U	5 U	3 U

Location ID: / Date Collected:	Units	87-FP5 07/30/18	OW-3S 08/09/17	OW-3S 10/09/17	RFI-81-08 03/20/15	RFI-81-11 03/31/15	RFI-81-12R 09/24/15	RFI-81-39R 03/27/15	RFI-81-49 03/27/15
1,4-Dioxane	ug/L	1 U	3 U	3 U	5 U	5 U	3 U	**46 (GSI-H, RDW) [42 (GSI-H, RDW)]**	5 U

Location ID: / Date Collected:	Units	RFI-81-51 03/20/15	RFI-85-04R 08/31/17	RFI-85-04R 10/09/17	RFI-85-04R 07/30/18	RFI-85-05 08/31/17	RFI-85-05 10/10/17	RFI-85-05 07/30/18	RFI-86-03 09/24/15
1,4-Dioxane	ug/L	**6 (GSI-H)**	3 U	3 U	1 U	3 U	3 U	1 U	4 UB

Location ID: / Date Collected:	Units	RFI-86-03 10/27/16	RFI-86-05 03/19/15	RFI-86-06S 03/18/15	RFI-86-06S 09/24/15	RFI-86-06S 10/26/16	RFI-86-06S 08/31/17	RFI-86-06S 10/09/17	RFI-86-06S 10/20/17
1,4-Dioxane	ug/L	3 U	**26 (GSI-H, RDW)**	5 U	3 U [3 U]	3 U [3 U]	3 U	3 U	3 U

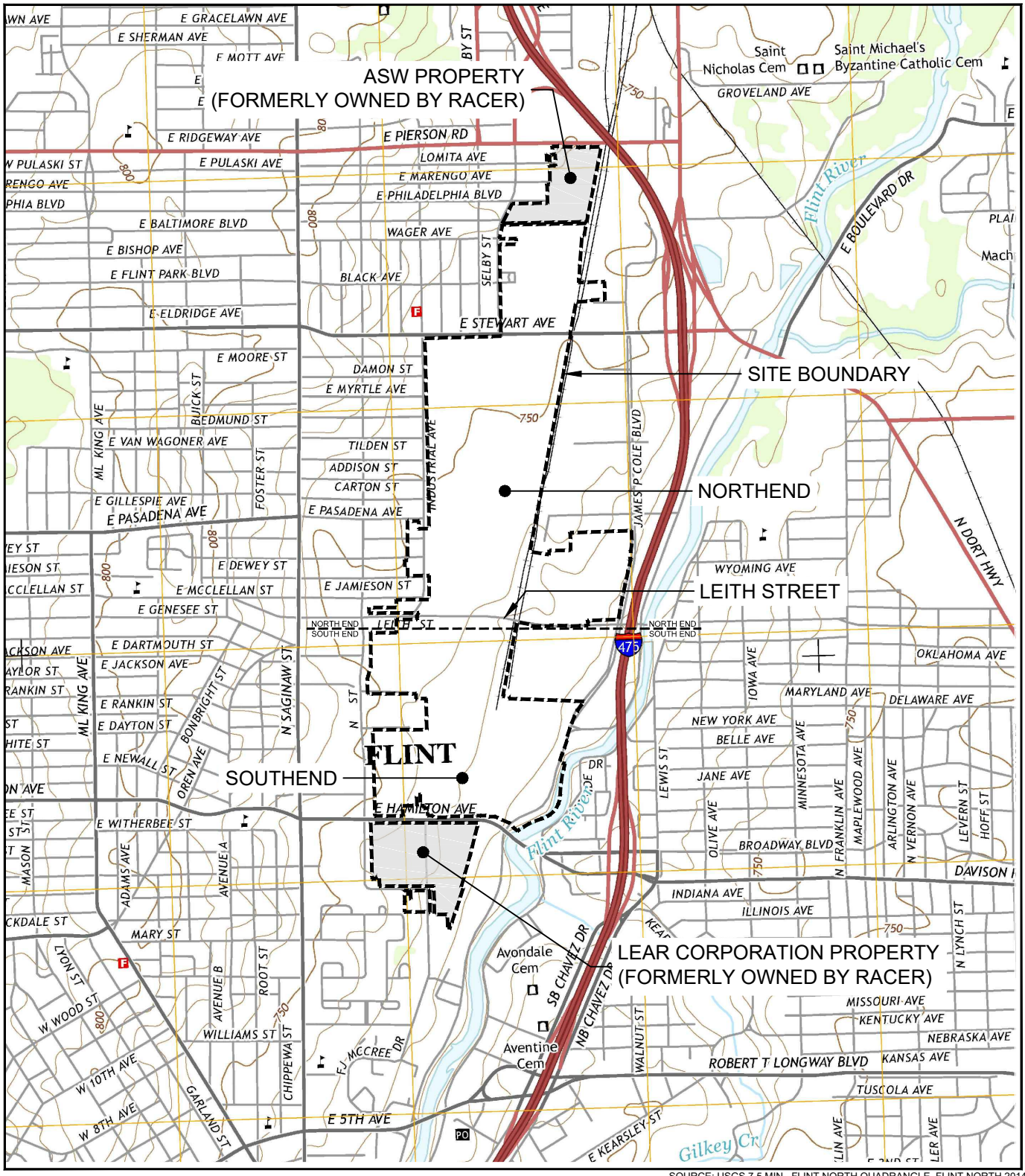
Location ID: / Date Collected:	Units	RFI-86-06S 07/30/18	RFI-86-08R 03/19/15	RFI-86-08R 09/24/15	RFI-86-08R 10/27/16	RFI-86-08R 10/19/17	RFI-86-14 09/24/15	RFI-86-14 10/27/16
1,4-Dioxane	ug/L	1 U	**182 (GSI-H, RDW)**	NA	**117 (GSI-H, RDW) [178 (GSI-H, RDW)]**	**117 (GSI-H, RDW)**	3 U	3 U

Notes:
GSI-H - 2018 Groundwater-surface water interface - human drinking value
RDW - Residential Drinking Water criteria
Bolded and shaded results exceed one or more criteria
ug/L - micrograms per liter
U - Analyte not detected above the reporting limit
Y - Elevated reporting limit due to high target concentrations

Table 9. 2017-2018 Outfall 005 Storm Sewer Data
RACER Trust, Buick City Site, Flint, Michigan

Location ID: Sample Depth(): Date Collected:	Units	MH 5-4 08/31/17	MH 5-4 10/10/17	MH 5-4 07/30/18	WPTrap 08/31/17	WPTrap 10/10/17	WPTrap 07/30/18
1,4-Dioxane	ug/L	3 U	3 U	1 U	3 U	3 U	1 U

Notes:
ug/L - micrograms per liter
U - Analyte not detected above the reporting limit



SOURCE: USGS 7.5 MIN., FLINT NORTH QUADRANGLE, FLINT NORTH 2014

0 2000' 4000'

APPROXIMATE SCALE IN FEET

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FLINT, MICHIGAN

SITE LOCATION MAP

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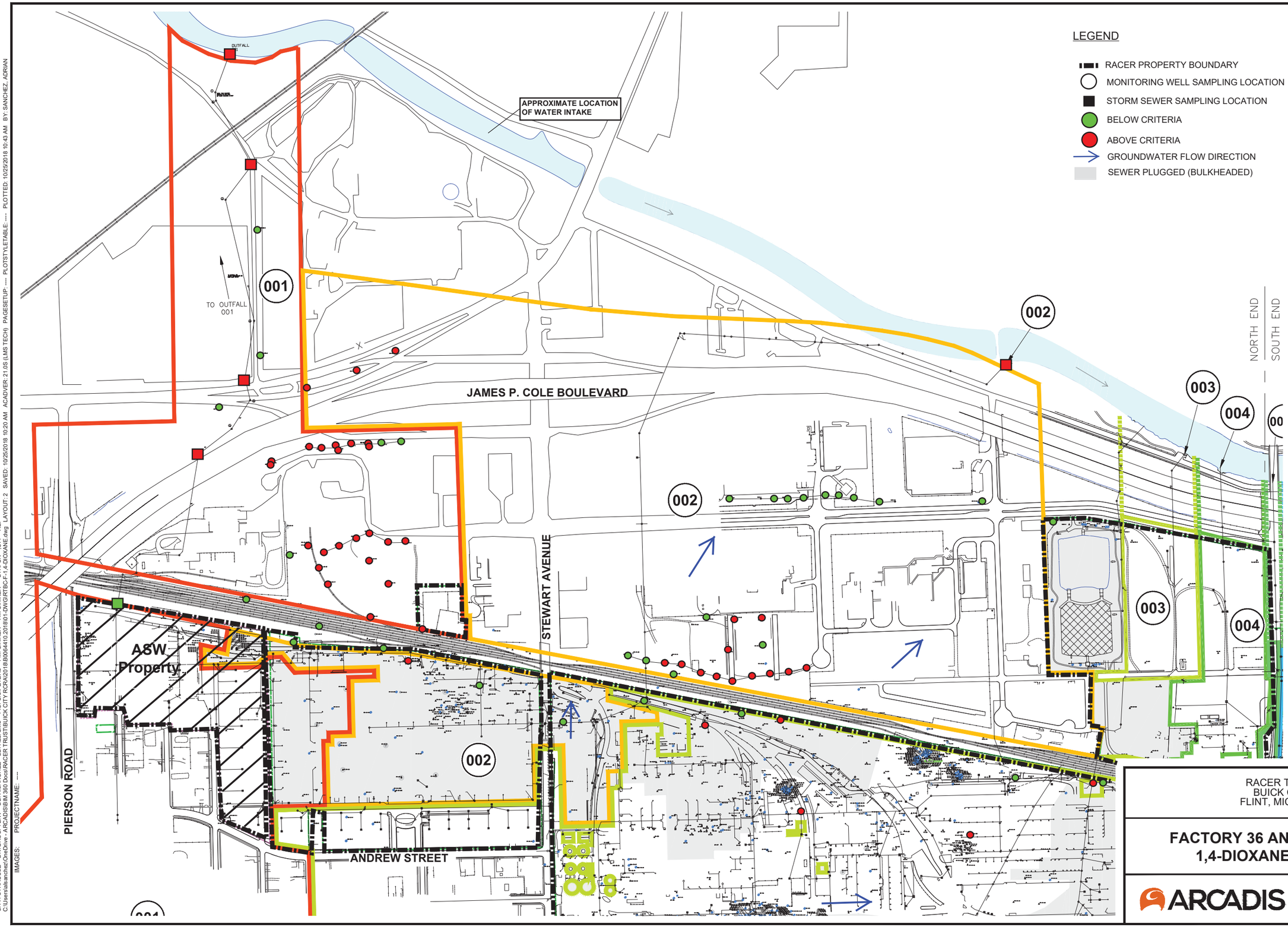
FIGURE 1



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FACTORY 36 AND FACTORY 10 1,4-DIOXANE SUMMARY

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FIGURE
2

UNIT FLOW THRU TERMINAL LOCATION

CONSOLIDATED FREIGHTWAYS

VACANT INDUSTRIAL PARK

KASLE STEEL / AUTO BLANKERS LOCATION

P.P.G. INDUSTRIES

JAMES P. CODE BLVD.

ST. JOHN'S AVE.

MICHIGAN AVE

TEWAKI AVE.

FLINT POLICE TRAINING BLDG

BELL'S PRODUCE

FORMER POWERHOUSE BLDG.

STORAGE

LOT A

LOT B

EASTERN GARAGE

AERATION LAGOON

SCRAPYARD

BLDG 70

MW-10-22
MW-10-23
MW-10-25
SB-10-26
GM-1
GM-2
GM-3
GM-4
GM-5
GM-6
GM-7
GM-8
GM-9
GM-10
GM-12
OW-3S 723.56
OW-5 718.29
RFI-07-08 716.28
RFI-07-01R2 720.74
RFI-10-03 743 09
RFI-10-07 744.02
RFI-10-11 741.52
RFI-10-24 740.17
RFI-10-26 742.16
RFI-10-32 741.16
RFI-10-33 742.94
RFI-10-35 740.52
RFI-10-36 739.87
RFI-10-37 739.66
RFI-36-13 744.86
RFI-36-14 745.14
RFI-55-02 743.84
RFI-81-08 732.35
RFI-81-11 735.13
RFI-81-13 733.99
RFI-81-33 731.37
RFI-81-35 731.47
RFI-81-49 731.80
RFI-81-50 736.26
RFI-81-51 729.52
RFI-85-02/02R 731.54
RFI-85-05 725.32
RFI-86-02 727.63*
RFI-86-03 729.34
RFI-86-06D 714.96
RFI-86-06S 725.42
RFI-86-08R 733.63
RFI-86-15 715.79
RFI-86-16R 715.79
RFI-86-01R 714.70
RFI-02-08R 732.98
RFI-03-03 740.03
RFI-03-03R2 736.01*
RW-1 741.61
RW-3 744.53
20-FP8 741.48*
20-FP9 742.15
20-FP10R
20-FP12 740.51
20-FP14 714.74
20-FP15 730.10
20-FPD2 714.74
20-FPD3 717.78
20-500R 745.42
20-502 744.42*
20-503 743.44
20-506
20-105R 743.54
20-144
20-164
20-168
55-2 743.57
70-100 736.86
70-101 738.92*
70-103 739.61*
70-104 739.25*
70-105 738.27
70-107 736.27
70-107R 737.48
70-108R 740.06
70-109 738.71
70-163 738.06
70-164 738.13
86-100 735.21
87-FP3 730
MW-00-FP6 724.17

LEGEND:

- RACER PROPERTY BOUNDARY
- FORMER RACER PROPERTY BOUNDARY
- FORMER BUILDING/FACTORY EXTENTS
- MONITORING WELL
- ABANDONED MONITORING WELL
- RFI SOIL BORING/GRAB
- APPROXIMATE KNOWN EXTENT OF MEASURABLE LNAPL (>0.1 FEET)
- STORM SEWER LINE
- COMPLETED BULKHEAD
- 744.47 GROUNDWATER ELEVATION (IN FEET)
- GROUNDWATER ELEVATION CORRECTION FOR LNAPL
- 728 GROUNDWATER ELEVATION CONTOUR LINE (DASHED WHERE INFERRED)
- APPROXIMATE AREAS WITH NO DIRECT DRAINAGE TO THE STORM SEWER

- 1,4-DIOXANE EXCEEDS CRITERIA IN ONE OR MORE SAMPLES
- 1,4-DIOXANE DOES NOT EXCEED CRITERIA

NOTE THAT SCREENING LOCATIONS RFI-55-01, RFI-55-09, 43-103R, RFI-65-01, AND RFI-85-04 ARE LOCATED OFF THIS MAP TO THE NORTH OR EAST. NONE OF THE SAMPLES DETCTED 1,4-DIOXANE ABOVE A CRITERIA.

NOTES:

1. BASE MAP INFORMATION FROM A SURVEY BY BMJ, INC. DATED APRIL 2001, AT A SCALE OF 1:100. AERIAL IMAGE FROM ARCGIS 10 ONLINE MAPPING, ACCESSED 6/12/2013.
2. BASED ON INFORMATION AVAILABLE AS OF AUGUST 2017.

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FACTORY 85/86 AREA 1,4-DIOXANE SUMMARY

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FIGURE 3