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BARR

February 28, 2024

Mr. John Sager
Wisconsin Department of Natural Resources
1701 North 4th Street
Superior, WI 54880

Re: 2023 Remediation Progress Report for Murphy Oil Tank 40 Release Site
Superior Refining Company LLC Refinery, Superior, WI
WDNR BRRTS# 02-16-222712
Facility ID: 816009590

Dear John:

On behalf of Superior Refining Company LLC (SRC), Barr Engineering Co. (Barr) is submitting this remediation progress report for the Murphy Oil Tank 40 Basin release site (Tank 40) at the SRC refinery in Superior, Wisconsin. Periodic site progress reporting to the Wisconsin Department of Natural Resources (WDNR) is required pursuant to ss. NR 700.11(1) and 724.13(3), Wisconsin Administrative Code. This report summarizes monitoring activities conducted at the site in 2023.

1 Facility and Site Background Information

Figure 1 shows the location of Tank 40 within the refinery boundaries, the approximate property boundary of the refinery, and areas surrounding the refinery. The Tank 40 site is located in the SW ¼ of the SW ¼ of Section 25, Township 49 North, Range 14 West, Superior Township of Douglas County, Wisconsin.

The closest surface water to Tank 40 is Newton Creek, located approximately 2,000 feet east of the Tank 40 basin (Figure 1). The Tank 40 basin is located in the central area of the refinery which is relatively flat.

Figure 2 presents the site layout and monitoring locations. The ground surface of the Tank 40 basin is unpaved and is underlain by native clay. The average depth to groundwater in the Tank 40 monitoring wells is 3 to 4 feet below ground surface (bgs) depending on time of year. The regional groundwater flow direction below the refinery and across the Tank 40 site is expected to be toward the east (Figure 2).

As presented in the April 2014 Gannett Fleming, Inc. (GF) *Final Memorandum of Agreement, Site Investigation and Remedial Action* Plan (GF, 2014) for the refinery site, the hydraulic conductivity of the native clay underlying the refinery is on the order of 1×10^{-7} centimeters per second (cm/sec). Assuming a horizontal hydraulic gradient of 0.003 feet per foot eastward and an effective porosity of 0.06, the estimated horizontal groundwater flow velocity at the refinery is approximately 0.01 foot per year (ft/yr) (GF, 2014).

In October 2011, Calumet Superior LLC (Calumet) acquired the refinery from Murphy Oil. In November 2017, Husky Superior Refining Holding Corp. (Husky Superior) purchased Calumet and changed its legal name to Superior Refining Company LLC (SRC). In January 2021, Husky and Cenovus Energy Inc. (Cenovus) merged to become Cenovus, however the refinery is still referred to as SRC.

2 Tank 40 Basin Release Site Investigation and Remediation Summary

On October 17, 1998, approximately 2,300 gallons of "straight-run" gasoline were released in the Tank 40 basin. Murphy Oil notified the WDNR of the release in a letter dated December 2, 1998. At the time of the spill, the diked area was full of storm water, and the gasoline floated on top of the storm water within the diked area. A vacuum truck was used to recover residual product and storm water from the diked area. These liquids were placed in Murphy Oil's No. 1 American Petroleum Institute (API) oil/water separator for recovery of the gasoline. As a safety precaution, the affected area was washed with water, and the wash water also was removed with a vacuum truck and placed in the API separator. Following the release and immediate response actions, multiple phases of investigation were initiated including the installation of soil borings, monitoring wells, monitoring points, test pits, and recovery sumps. Currently, long-term groundwater monitoring is being conducted at the site as well as product gauging and passive recovery. This report presents monitoring and product gauging data for 2023.

As described in previous reports, measurable product has been encountered in monitoring wells associated with the Tank 40 basin on multiple occasions since July 2000. Since then, the monitoring network in the Tank 40 basin consisting of: monitoring wells MW-1/T40, MW-2/T40, and MW-4/T40 through MW-7/T40; monitoring points MP1/T40 and MP-1/40, and test pit sump TP-1/T40; and an interceptor trench with a sump TS-1/T40 (Figure 2) have been routinely gauged for the presence of product. Historically free product has only been found in MW-1/T40 (2003), MW-2/T40 (2017) and MW-4/T40 (2007). When present, product was manually removed and sent to the refinery's API oil/water separator. Separated oil was stored for use at the refinery and the water was treated at the on-site wastewater treatment plant (WWTP). Monitoring well MW3/T40 was abandoned in July 2007 (GF, 2019). Monitoring point MP-3/T40 was sealed in September 2022 (Barr, 2023).

Research conducted by the API and published in a 2004 document titled, "*API Interactive LNAPL Guide, Version 2.0*", found that periodic manual removal of free product is most appropriate for low permeability aquifers (hydraulic conductivity < 1×10^{-5} cm/sec). The hydraulic conductivity of the native clay underlying the refinery is on the order of 1×10^{-7} cm/sec, as described in the previous section of this letter report (GF, 2014).

Based on the recommendations included in the API Interactive LNAPL Guide document, free product has been manually bailed when observed in a monitoring well, monitoring point, test pit sump, or interceptor trench. The API Interactive LNAPL Guide also states that product preferentially accumulates in wells when the potentiometric surface is low. This occurs because, as the potentiometric surface drops, product that remains above the water level will drain downward into the well. As the potentiometric surface rises, the product becomes submerged and trapped in the soil pores and subsequently will not accumulate in the

well. To take advantage of this apparent pattern, the wells located in the basin were purged dry following each depth to product or groundwater measurement event to promote the accumulation of product. Recovered product and purged water are separated and stored or sent through the refinery's API oil/water separator and on-site WWTP as described above (GF, 2019).

Based on the consistent and relatively widespread presence of product in the basin between July 2000 and July 2003, an interceptor trench was installed in August 2003 (GF, 2019). The 100-foot long interceptor trench was installed near the downgradient edge of apparent free product. Each end of the 8- to 8.5-foot-deep trench slopes toward its middle, and a 6-inch diameter recovery trench sump (TS-1/T40) was installed in the middle of the trench (Figure 2). Since the native clay surrounding this trench has a low permeability, the interceptor trench fills relatively slowly (GF, 2019).

Between June 2004 and April 2010, recovery trench sump TS-1/T40 was periodically pumped, and approximately 187,000 gallons of gasoline-contaminated groundwater were recovered. The pumped water was treated in the refinery's API separator/WWTP. The goal was to keep the water level in the trench relatively low to promote the flow of petroleum-contaminated groundwater and product into the trench. Since the trench was installed in August 2003, no measurable product, only petroleum-contaminated groundwater, has accumulated in TS-1/T40. As a result, no further pumping of the recovery trench sump is currently planned unless product accumulates in TS-1/T40, as described in the Future Work section of this report.

3 Remedial and Monitoring Activities in 2023

Since the most recent remediation progress report was submitted to the WDNR on March 2, 2023 (Barr, 2023), work at Tank 40 has included the gauging of water and product levels in site monitoring wells, monitoring points, test pit sump, and recovery trench sump and the collection of groundwater samples from seven locations.

Year-round access to monitoring wells, monitoring points, and sumps at the site is not practical because of relatively shallow groundwater, cold weather, and snow. When conditions allow access, water and product levels are monitored during the spring, summary and fall. If product is encountered, the product is removed and sent through the refinery's API oil/water separator. Separated oil is stored for use at the refinery and the water is treated at the on-site WWTP.

In 2023, monitoring wells and recovery sump TS-1/T40 were gauged, purged, and sampled in spring and fall (April/May and September/October). The monitoring wells, monitoring points and sumps are currently checked for the presence of product on a quarterly basis and, if encountered, product is removed by bailing. Monitoring well, monitoring point, test pit sump, and recovery trench sump gauging activities conducted in 2023 are summarized below and fluid levels are summarized in Table 1. Cumulative groundwater analytical results from the seven locations for are summarized on Table 2.

3.1 Groundwater Levels

During this reporting period, the depth to groundwater was measured during each purging and sampling event. The depth to water measurements are summarized on Table 1. Groundwater levels in the wells are either influenced by local surface/melt water in the spring or typically do not have sufficient time to reach static levels after they are purged dry later in the year. Consequently, a groundwater contour map representing static conditions for the Tank 40 site has not been created. However, the regional groundwater flow direction in the vicinity of the Tank 40 site is to the east (GF, 2014) (Figure 2).

3.2 Product Recovery

During the reporting period, measurable product was not encountered in the monitoring wells, monitoring points, test pit sump, or recovery trench sump (Table 1). As established in the 2019 report (GF, 2019), if free product is not observed during the April/May gauging event, the wells, points, and sumps are then checked quarterly (rather than monthly) through the October sampling event.

SRC will continue to check for free product quarterly, but for all practical purposes, free product likely has been recovered to the extent practical from the Tank 40 basin.

3.3 Groundwater Sampling and Results

Groundwater samples were collected by Barr and Insight Environmental (Insight) field staff during May and October 2023. Each well was purged dry twice and allowed to recover for at least 14 days between purge events and prior to the collection of the groundwater samples. Routine sampling of monitoring wells MW-1/T40, MW-2/T40, and MW-4/T40 through MW-7/T40 and recovery trench sump TS-1/T40 was conducted on May 30, 2023, and October 16, 2023. Field staff used a new one-time-use polyethylene disposable bailer with new nylon rope to collect each groundwater sample. The spring 2023 and fall 2023 groundwater samples were sent to Pace Analytical (Pace) in in Minneapolis, Minnesota (Wisconsin laboratory certification #999407970); samples were analyzed for petroleum volatile organic compounds (PVOCs) using Method 8260B. The PVOC analyte list consisted of benzene, toluene, ethylbenzene, and xylenes (BTEX); 1,2,4- and 1,3,5-trimethylbenzene (TMB); and methyl-tert-butyl ether (MTBE).

Table 2 presents the analytical results of the groundwater samples compared to the NR 140 Preventative Action Limits (PAL) and Enforcement Standards (ES). The TMB results presented on Table 2 are a sum of the concentrations of 1,2,4-TMB and 1,3,5-TMB. As shown in Table 2:

- Samples from the six monitoring wells and interceptor trench (TS-1/T40) collected in May and / or October 2023 contained one or more PVOCs at concentrations equal to or greater than NR 140 ES, which is consistent with historical data.

The benzene trend analysis plots in Figure 3 include data from MW-1/T40, MW-2/T40, MW-4/T40, MW-5/T40, MW-6/T40, MW-7/T40, and TS-1/T40. Note that the plotted data for MW-1/T40, MW-2/T40 and MW-4/T40 only includes the time since measurable free product was last encountered (2003, 2017 and 2007, respectively). The best-fit exponential trend lines were generated using a scatter plot chart. As

shown on Figure 3, dissolved-phase benzene concentrations in the monitoring wells have followed a general downward trend. Attachment A provides copies of the laboratory reports and chain of custody records for the groundwater samples collected in 2023.

3.4 Monitoring Well Maintenance Activities

During the fall 2023 sampling event the riser at MW-1/T40 was identified to be loose and disconnected at the flush-treaded joint near the ground surface (see photo 1). There was no evidence that the well was compromised due to the loose riser. On November 11, 2023 a new section of riser was screwed onto the riser in the ground (see photo 2).

4 Future Work

SRC's work plan for 2024 is as follows:

- Continue to check for, and if present, manually bail product (as conditions allow) from the four monitoring wells (MW-1/T40, MW-2/T40, and MW-4/T40 through MW-7/T40), two monitoring points (MP-1/T40 and MP-2/T40), test pit sump (TP-1/T40) and recovery trench sump (TS-1/T40). If, product is not observed during the spring gauging event, as was the case in 2019- 2023, these wells, point, and sumps will only be checked for product quarterly. If product is observed in TS-1/T40, the recovery trench sump will be pumped out using an on-site vacuum truck. Any purged product/water will continue to be separated and stored or sent through the refinery's No. 1 API oil/water separator and on-site WWTP.

- Collect biannual (spring and fall) groundwater samples from monitoring wells, monitoring points, and the recovery trench sump TS-1/T40 when free product is not observed, and have the samples analyzed for PVOCs by a Wisconsin-certified laboratory using EPA Method 8260B. Each monitoring well will be purged dry twice and allowed to recover for at least 14 days prior to the collection of samples.

- Report the results of groundwater sample analysis, as well as the results of the recovery of product, in a remediation progress report to the WDNR by the end of quarter one 2025. If product is not encountered in any of the wells in 2024, and decreasing trends in benzene contaminant concentrations continue, a site closure request may be prepared for WDNR review and approval.

If you have any questions or need additional information, please reach out to Joseph Pearson at SRC (joseph.pearson@cenovus.com) or me (lcarney@barr.com).

Sincerely,

Lynette M. Carney
Project Manager

cc: Joseph Pearson (SRC)

Tables

Table 1	2023 Fluid Level Monitoring Data
Table 2	Groundwater Analytical Results for GRO and Detected VOCs

Figures

Figure 1	Site Location Map
Figure 2	Tank 40 Area Site Layout
Figure 3	Benzene Groundwater Concentrations vs. Time, MW-1/T40, MW-4/T40, MW-5/T40, MW-6/T40, and MW-7/T40

Attachments

Attachment A	Pace Analytical Laboratory Reports

References

Barr Engineering Co., 2023. *2022 Remediation Progress Report for Murphy Oil Tank 40 Release Site, Superior Refining Company LLC Refinery, Superior, WI, WDNR BRRTS# 02-16-222712, Facility ID: 816009590.* March 2, 2023.

Gannett Fleming, Inc. (GF), 2014. *Final Memorandum of Agreement, Site Investigation and Remedial Action Plan, Superior Refinery, Superior, Wisconsin, WDNR BRRTS# 02-16-559511*. April 2014.

GF, 2019. *2019 Remediation Progress Report for Tank 40 Release Site, Superior Refining Company LLC Refinery, Superior, WI, WDNR BRRTS# 02-16-222712 and Facility ID: 816009590*. November 26, 2019.

CERTIFICATION

"I, Lynette M. Carney, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03(1), Wis. Adm. Code, am registered in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code or licensed in accordance with the requirements of ch. GHSS 3, Wis. Adm. Code; and that, to the best of my knowledge, all of the information contained in this document is correct, and the document was prepared in compliance with all applicable requirements in Chapters NR 700 to 726, Wis. Adm. Code."

Lynette M. Carney, PG Reg #: 1138	February 28, 2024 Date

Site Photos

Photo 1: MW-1/T40 before riser was replaced. Photo taken on October 16, 2023.

Photo 2: MW-1/T40 after riser and was replaced. Photo taken November 7, 2023.

Tables

Table 1
2023 Fluid Level Monitoring Data
Tank 40 Release Site (1)
Superior Refining Company LLC
Superior, Wisconsin

Date	MP-1/T40		MP-2/T40		MW-1/T40		MW-2/T40		MW-4/T40		MW-5/T40		MW-6/T40		MW-7/T40		TP-1/T40		TS-1/T40		Comments/ Footnotes
	DTP	DTW	DTP	DTW	DTP	DTW	DTP	DTW	DTP	DTW	DTP	DTW	DTP	DTW	DTP	DTW	DTP	DTW	DTP	DTW	
	Depth to Fluid from Top of Casing (feet)																				
05/03/23	--	4.88	--	--[5]	--	3.15	--	3.30	--	6.62	--	3.50	--	3.71	--	3.70	--	5.43	--	3.60	(2)
05/17/23	--	5.50	--	6.54	--	3.45	--	3.95	--	3.50	--	4.00	--	4.08	--	4.07	--	5.28	--	4.21	(2)
05/30/23	--	7.10	--	7.12	--	4.20	--	4.75	--	4.01	--	4.92	--	5.30	--	4.72	--	5.40	--	5.12	(3)
07/19/23	--	5.06	--	6.65	--	4.29	--	3.44	--	3.79	--	4.49	--	4.56	--	4.83	--	5.05	--	5.13	(4)
09/19/23	--	4.90	--	5.9	--	4.50	--	3.18	--	3.54	--	3.48	--	3.70	--	3.63	--	5.29	--	3.52	(2)
10/03/23	--	4.83	--	6.10	--	3.22	--	6.84	--	3.44	--	3.40	--	3.54	--	3.51	--	5.23	--	3.57	(2)
10/16/23	--	3.34	--	6.03	--	3.34	--	7.40	--	3.25	--	3.41	--	10.66	--	2.55	--	4.60	--	3.55	(3)

NOTES:

DTP = Depth to product.

DTW = Depth to water.

nm = Not measured.

-- = Not applicable/no free product.

FOOTNOTES:

(1) Table does not include data from MW-5/T40 when that well was gauged for Environmental Repair Program (ERP) monitoring or MP-3/T40 as it was sealed in 2022

(2) Bailed the monitoring wells (MWs) dry in preparation for sampling.

(3) Sampled the MWs (see Table 2 for summary of analytical results).

(4) Free product check.

(5) No water was present to measure.

Table 2
Groundwater Analytical Results for GRO and Detected VOCs
Tank 40 Release Site
Superior Refining Company LLC
Superior, Wisconsin

Well ID / Date	Substance Concentration (µg/l) and Results Qualifier (if any)								
	GRO	**Benzene**	**Ethylbenzene**	**Toluene**	**Xylenes**	**TMBs**	**MTBE**	**Isopropyl-benzene**	**n-Propyl-benzene**
NR 140 PAL	NS	*0.5*	*140*	*160*	*400*	*96*	*12*	NS	NS
NR 140 ES	NS	**5**	**700**	**800**	**2,000**	**480**	60	NS	NS
MW-1/T40									
10/6/1999	8180	***445***	*206*	***961***	***2850***	***525***	< 6.0	36.2	< 15.0
12/9/1999	8860	***433***	*293*	*402*	***3170***	***2677***	< 6.0	na	na
3/9/2000	15000	***1700***	***720***	***1400***	***5800***	***1170***	< 16	na	na
6/14/2000	21000	***2400***	*570*	***2100***	***6900***	***1620***	< 24	na	na
9/12/2000	32000	***2100***	***850***	***1000***	***5500***	***1180***	< 24	na	na
3/21/2001	20000	***2700***	***890***	***860***	***7100***	***1520***	< 24	na	na
3/6/2002	10000	***2000***	*500*	140	***5200***	***1200***	< 10	na	na
9/12/2002	14000	***1600***	***710***	32	***4210***	***1170***	< 4.3	na	na
3/12/2003	FP	FP	FP	FP	FP	FP	FP	FP	FP
9/30/2004	23000	***3200***	***1400***	***2800***	***6700***	***1280***	< 9.0	na	na
5/26/2005	25100	***3340***	***1600***	***2620***	***8370***	***1705***	< 30.0	na	na
11/9/2005	18200	***3170***	***1350***	***1780***	***8560***	***1605***	< 30.0	na	na
5/10/2006	20500	***3750***	***1290***	***1500***	***8190***	***1674***	< 15.0	na	na
11/16/2006	25800	***2730***	***1670***	***2200***	***7900***	***1557***	< 30.0	na	na
5/23/2007	16700	***2260***	***706***	*756*	***5350***	***1385***	< 15.0	na	na
11/15/2007	22500	***2100***	***1220***	*621*	***6740***	***1897***	< 60.0	na	na
5/27/2008	22400	***3410***	***1270***	*763*	***7700***	***1614***	< 60.0	na	na
11/24/2008	16600	***1990***	***882***	*401*	***5760***	***1543***	< 30.0	na	na
5/27/2009	19700	***3340***	***1510***	*361*	***7870***	***1703***	< 30.0	na	na
11/23/2009	8720	***1040***	*377*	66.0	***3264***	***791***	< 6.00	na	na
5/19/2010	10400	***1460***	*642*	44.8 J	***3644***	***845***	< 15.0	na	na
10/21/2010	15000	***2040***	***817***	23.8 J	***5391***	***1396***	< 15.0	na	na
6/16/2011	na	***1640***	***742***	< 20.0	***4067***	***837***	< 25.0	na	na
10/25/2011	na	***1720***	*684*	< 20.0	***4646***	***1198***	< 25.0	na	na
5/16/2012	na	***2030***	***868***	< 13.4	***5088***	***1377***	< 12.2	na	na
8/21/2013	na	***2110***	***1050***	< 8.8	***5499***	***1769***	< 9.9	na	na
6/24/2014	na	***466***	83.9	< 5.0	*1797.3*	***779***	< 1.7	na	na
10/21/2014	na	***438***	6.1	< 2.5	***2406***	***901***	< 0.87	na	na
6/23/2015	na	***1530***	*480*	< 5.0	***3996***	***1105***	< 1.7	na	na
10/6/2015	na	*0.51* J	0.79 J	1.4	8.51 J	*123.0*	< 0.17	na	na
5/24/2016	na	***2520***	***1030***	< 10.0	***5744***	***1189***	< 3.5	na	na
10/5/2016	na	***163***	7.5 J	< 5.0	*1003.1*	*312.9*	< 1.7	na	na
5/16/2017	na	***1790***	***815***	< 12.5	***5250***	***1252***	< 4.4	na	na
10/25/2017	na	***616***	27.0	< 12.5	***2094.3***	***569***	< 4.4	na	na
6/12/2018	na	***1240***	*405*	< 10.0	***3616.2***	***1106***	< 3.5	na	na
10/9/2018	na	***48.7***	0.79 J	0.86 J	374.3	*183.9*	< 1.2	na	na
5/21/2019	na	***374***	103	0.61 J	*1179.8*	*426*	< 1.2	na	na
10/9/2019	na	***100***	1.2	0.55 J	317.2	*133.5*	< 1.2	na	na
5/27/2020	na	***152*** J-	64.1	< 0.67	311	*125*	< 3.1	na	na
10/6/2020	na	***1460***	*613*	1.8	***4900***	***1544***	< 0.12	na	na
5/24/2021	na	***334***	*185*	< 0.72	*987*	*291*	< 2.8	na	na
10/4/2021	na	***125***	27.1	0.60	*670*	*334*	< 0.18	na	na
5/25/2022	na	***1180***	***716***	< 0.52	***3180***	***1022***	< 0.63	na	na
10/11/2022	na	***97.7***	3.7	0.57 J	*598*	*338*	< 0.13	na	na
5/30/2023	na	***1510***	***975***	0.51 J	***4120***	***1190***	< 0.25	na	na
10/16/2023	na	***365***	*146*	0.89 J	*832*	*411*	< 0.25	na	na

Table 2
Groundwater Analytical Results for GRO and Detected VOCs
Tank 40 Release Site
Superior Refining Company LLC
Superior, Wisconsin

Well ID / Date	Substance Concentration (µg/l) and Results Qualifier (if any)								
	GRO	**Benzene**	**Ethylbenzene**	**Toluene**	**Xylenes**	**TMBs**	**MTBE**	**Isopropyl-benzene**	**n-Propyl-benzene**
NR 140 PAL	NS	*0.5*	*140*	*160*	*400*	*96*	*12*	NS	NS
NR 140 ES	NS	**5**	**700**	**800**	**2,000**	**480**	60	NS	NS
MW-2/T40									
3/6/2002	NI	NI	NI	NI	NI	NI	NI	NI	NI
9/12/2002	FP	FP	FP	FP	FP	FP	FP	FP	FP
thru	FP	FP	FP	FP	FP	FP	FP	FP	FP
9/30/2004	FP	FP	FP	FP	FP	FP	FP	FP	FP
5/26/2005	FP	FP	FP	FP	FP	FP	FP	FP	FP
11/9/2005	FP	FP	FP	FP	FP	FP	FP	FP	FP
11/16/2006	FP	FP	FP	FP	FP	FP	FP	FP	FP
5/23/2007	FP	FP	FP	FP	FP	FP	FP	FP	FP
11/15/2007	FP	FP	FP	FP	FP	FP	FP	FP	FP
5/27/2008	FP	FP	FP	FP	FP	FP	FP	FP	FP
11/24/2008	FP	FP	FP	FP	FP	FP	FP	FP	FP
5/27/2009	FP	FP	FP	FP	FP	FP	FP	FP	FP
11/23/2009	FP	FP	FP	FP	FP	FP	FP	FP	FP
5/19/2010	FP	FP	FP	FP	FP	FP	FP	FP	FP
10/21/2010	FP	FP	FP	FP	FP	FP	FP	FP	FP
6/16/2011	FP	FP	FP	FP	FP	FP	FP	FP	FP
10/25/2011	FP	FP	FP	FP	FP	FP	FP	FP	FP
5/16/2012	FP	FP	FP	FP	FP	FP	FP	FP	FP
8/21/2013	na	***13400***	***3190***	***13100***	***12460***	***2599***	< 49.4	na	na
6/24/2014	na	***12000***	***2000***	***10100***	***9370***	***1375***	< 21.8	na	na
10/21/2014	FP	FP	FP	FP	FP	FP	FP	FP	FP
6/23/2015	FP	FP	FP	FP	FP	FP	FP	FP	FP
10/6/2015	FP	FP	FP	FP	FP	FP	FP	FP	FP
5/24/2016	na	***15300***	***1740***	***7970***	***8770***	***1374***	< 17.4	na	na
10/5/2016	na	***6870***	***899***	***4330***	***9840***	***2186***	< 8.7	na	na
5/16/2017	na	***11500***	***1640***	***4730***	***10470***	***1392***	< 17.4	na	na
10/25/2017	FP	FP	FP	FP	FP	FP	FP	FP	FP
6/12/2018	na	***10400***	***1570***	***2080***	***9920***	***1635***	< 21.8	na	na
10/9/2018	na	***8450***	***1280***	***1130***	***9980***	***1349*** J	< 156	na	na
5/21/2019	na	***12100***	***1710***	*661*	***10300***	***1473*** J	< 156	na	na
10/9/2019	na	***10600***	***1670***	*464* J	***8910***	***1445*** J	< 156	na	na
5/27/2020	na	***9940***	***1230***	*166*	***8470***	***1544***	< 125	na	na
10/6/2020	na	***10100***	***1700***	128	***9420***	***1562***	< 1.2	na	na
5/24/2021	na	***8790***	***1280***	34.0 J	***7520***	***1279***	< 113	na	na
10/4/2021	na	***9760***	***1470***	14.6 J	***9700***	***1510***	< 9.0	na	na
5/25/2022	na	***8300***	***1570***	28.1 J	***7680***	***1686***	*13.0* J	na	na
10/11/2022	na	***9860***	***1610***	6.1	***8870***	***1566***	< 0.13	na	na
5/30/2023	na	***7560***	***896***	21.8 J	***7440***	***1434***	< 12.6	na	na
10/16/2023	na	***9650***	***1540***	< 20.7	***8290***	***1649***	< 12.6	na	na
MW-3/T40									
3/6/2002	NI	NI	NI	NI	NI	NI	NI	NI	NI
9/12/2002	FP	FP	FP	FP	FP	FP	FP	FP	FP
3/12/2003	FP	FP	FP	FP	FP	FP	FP	FP	FP
9/30/2004	Well was not available for monitoring due to construction activities and was subseqently abandoned in July 2007								

Table 2
Groundwater Analytical Results for GRO and Detected VOCs
Tank 40 Release Site
Superior Refining Company LLC
Superior, Wisconsin

Well ID / Date	Substance Concentration (µg/l) and Results Qualifier (if any)								
	GRO	**Benzene**	**Ethylbenzene**	**Toluene**	**Xylenes**	**TMBs**	**MTBE**	**Isopropyl-benzene**	**n-Propyl-benzene**
NR 140 PAL	NS	*0.5*	*140*	*160*	*400*	*96*	*12*	NS	NS
NR 140 ES	NS	**5**	**700**	**800**	**2,000**	**480**	60	NS	NS
MW-4/T40									
3/6/2002	NI	NI	NI	NI	NI	NI	NI	NI	NI
9/12/2002	42000	***19000***	***1300***	***6200***	***4500***	***760***	< 110	< 82	< 120
3/12/2003	FP	FP	FP	FP	FP	FP	FP	FP	FP
9/30/2004	FP	FP	FP	FP	FP	FP	FP	FP	FP
5/26/2005	64300	***20500***	***2010***	***11900***	***9360***	***1581***	< 150	na	na
11/9/2005	66600	***17000***	***1620***	***9190***	***10710***	***3017***	< 300	na	na
5/10/2006	62000	***24900***	***2020***	***12100***	***9160***	***1780***	< 60.0	na	na
11/16/2006	52100	***20900***	***1450***	***8680***	***7970***	***1462***	< 15.0	na	na
5/23/2007	FP	FP	FP	FP	FP	FP	FP	FP	FP
11/15/2007	50200	***16000***	***1810***	***7720***	***7220***	***1519***	< 75.0	na	na
5/27/2008	62100	***23200***	***2100***	***10400***	***9940***	***2067***	< 75.0	na	na
11/24/2008	51100	***18300***	***1630***	***8000***	***8810***	***2167***	< 75.0	na	na
5/27/2009	50900	***21000***	***1570***	***8410***	***9910***	***1994***	< 60.0	na	na
11/23/2009	46300	***17000***	***1050***	***6290***	***8590***	***1798***	< 30.0	na	na
5/19/2010	47900	***17600***	***1150***	***6350***	***8470***	***1805***	< 60.0	na	na
10/19/2010	53500	***17700***	***1140***	***6180***	***11900***	***3136***	< 75.0	na	na
6/16/2011	na	***18800***	***1120***	***5880***	***7630***	***1446*** J	< 250	na	na
10/25/2011	na	***18600***	***1980***	***6460***	***8360***	***1419*** J	< 250	na	na
5/16/2012	na	***17100***	***1220***	***4910***	***8640***	***2058***	< 61.0	na	na
8/21/2013	na	***16800***	***1630***	***3070***	***9200***	***2428***	< 49.9	na	na
6/24/2014	na	***15700***	***949***	***1490***	***7660***	***1616***	< 34.8	na	na
10/21/2014	na	***10400***	*537*	*790*	***6830***	***1510***	< 17.4	na	na
6/23/2015	na	***8260***	*516*	*277*	***5180***	***1437***	< 17.4	na	na
10/6/2015	na	***6500***	109	< 50	***4530***	***1103***	< 17.4	na	na
5/24/2016	na	***14600***	***836***	< 50	***7240***	***1550***	< 17.4	na	na
10/5/2016	na	***1890***	< 10.0	< 10.0	***2293***	***778***	< 3.5	na	na
5/16/2017	na	***10200***	***807***	< 50	***7120***	***1285***	< 17.4	na	na
10/25/2017	na	***5890***	138	< 50	***6500***	***1459***	< 17.4	na	na
6/12/2018	na	***1640***	39.3	< 10.0	*1282*	*377.6*	< 3.5	na	na
10/9/2018	na	***3750***	28.4	< 3.4	***4780***	***1096***	< 24.9	na	na
5/21/2019	na	***3950***	*185*	< 3.4	***2421***	***562***	< 24.9	na	na
10/9/2019	na	***4910***	*214*	5.3 J	***3710***	***1061***	< 24.9	na	na
5/27/2020	na	***2770***	94.6	< 10.8	*1770*	***525.6*** a	< 49.8	na	na
10/6/2020	na	***10200***	***887***	2.5	***6680***	***1792***	< 0.12	na	na
5/24/2021	na	***4750***	*250*	< 7.2	***2620***	***818***	< 28.2	na	na
10/4/2021	na	***2960***	67.8	2.6	***2820***	***1020***	< 0.36	na	na
5/25/2022	na	***5840***	*574*	< 2.1	***3090***	***1255***	< 2.5	na	na
10/11/2022	na	***4980***	*164*	< 5.2	***3730***	***1572***	< 6.3	na	na
5/30/2023	na	***6420***	*546*	< 5.2	***3430***	***1316***	< 6.3	na	na
10/16/2023	na	***5730***	*374*	< 20.7	***3520***	***1551***	< 12.6	na	na

Table 2
Groundwater Analytical Results for GRO and Detected VOCs
Tank 40 Release Site
Superior Refining Company LLC
Superior, Wisconsin

Well ID / Date	Substance Concentration (µg/l) and Results Qualifier (if any)								
	GRO	**Benzene**	**Ethylbenzene**	**Toluene**	**Xylenes**	**TMBs**	**MTBE**	**Isopropyl-benzene**	**n-Propyl-benzene**
NR 140 PAL	NS	*0.5*	*140*	*160*	*400*	*96*	*12*	NS	NS
NR 140 ES	NS	**5**	**700**	**800**	**2,000**	**480**	60	NS	NS
MW-5/T40									
3/6/2002	NI	NI	NI	NI	NI	NI	NI	NI	NI
9/12/2002	< 50	< 0.25	< 0.53	< 0.84	< 1.83	< 1.33	< 0.87	< 0.66	< 0.95
3/12/2003	100	*3.9*	1.4 J	< 0.68	6.0 J	4.12	< 0.43	na	na
9/30/2004	18000	***980***	***1900***	10.0 J	***5800***	***1170***	4.2 J	na	na
5/26/2005	18700	***482***	***1930***	< 60	***7750***	***1558***	< 60	na	na
11/9/2005	11500	***372***	***1550***	< 30.0	***5430***	***1066***	< 30.0	na	na
5/10/2006	10500	***357***	***1400***	< 3.00	***5200***	***855***	< 3.00	na	na
11/16/2006	14900	***270***	***1820***	< 15.0	***6310***	***1381***	< 15.0	na	na
5/23/2007	16700	***279***	***1900***	< 6.00	***7070***	***1611***	< 6.00	na	na
11/15/2007	9840	***148***	*495*	< 6.00	***2588***	***1059***	< 6.00	na	na
5/27/2008	10400	***254***	***833***	28.7	***3194***	***1006***	< 6.00	na	na
11/24/2008	11000	***167***	***1020***	24.8	***3288***	***1052***	*23.2* J	na	na
5/27/2009	5010	***177***	*324*	33.8 J	*1132*	*427*	< 15.0	na	na
11/23/2009	9990	***191***	***888***	21.2 J	***2725***	***821***	< 6.00	na	na
5/19/2010	8730	***160***	*638*	< 7.40	***2170***	***805***	< 6.00	na	na
10/19/2010	9980	***173***	***833***	< 7.40	***2663***	***880***	*14.6* J	na	na
6/16/2011	na	***205***	*607*	< 8.00	*1835*	***576***	< 10.0	na	na
10/25/2011	na	***185***	***778***	< 8.00	***2331***	***1142***	< 10.0	na	na
5/16/2012	na	***220***	*579*	< 3.4	*1566*	***492***	< 3.0	na	na
8/21/2013	na	***310***	***825***	< 4.4	*1601.2*	***736***	< 4.9	na	na
6/24/2014	na	***135***	***756***	< 2.5	*1839.5*	***673***	< 0.87	na	na
10/21/2014	na	***63.1***	*208*	< 1.2	*611.0*	*256.7*	< 0.44	na	na
6/23/2015	na	*3.0*	11.2	< 0.50	< 28.9	10.7	< 0.17	na	na
10/6/2015	na	< 0.50	< 0.50	0.70 J	1.60 J	1.01 J	< 0.17	na	na
5/24/2016	na	***50.3***	*152*	< 1.0	*479.7* J	*165.9*	< 0.35	na	na
10/5/2016	na	< 0.50	< 0.50	< 0.50	< 1.50	< 1.00	< 0.17	na	na
5/16/2017	na	***43.6***	*259*	< 1.2	*668.5* J	*247.7*	< 0.44	na	na
10/25/2017	na	< 0.50	< 0.50	< 0.50	< 1.50	< 1.00	< 0.17	na	na
6/12/2018	na	*3.3*	16.6	< 0.50	< 76.40	33.9	< 0.17	na	na
10/9/2018	na	***9.6***	30.4	< 0.17	< 115.26	81.9	< 1.2	na	na
5/21/2019	na	***62.2***	*218*	< 0.17	*859.99* J	*353.8*	< 1.2	na	na
10/9/2019	na	***6.7***	8.2	< 0.17	172.44 J	*120.7*	< 1.2	na	na
5/27/2020	na	***47.9***	*261*	< 0.27	*643*	*272.1*	< 1.2	na	na
10/6/2020	na	***56.9***	*424*	< 0.12	*913*	*443*	< 0.12	na	na
5/24/2021	na	***55.3***	*197*	< 1.2	*517*	*256.2*	< 4.5	na	na
10/4/2021	na	***29.2***	*209*	< 0.11	*457*	*278.8*	< 0.18	na	na
5/25/2022	na	***34.2***	*106*	< 0.10	*115*	*142*	< 0.13	na	na
10/11/2022	na	< 0.10	< 0.11	< 0.10	< 0.20	< 0.24	< 0.13	na	na
5/30/2023	na	***32.2***	121	< 0.10	193	*201*	< 0.13	na	na
10/16/2023	na	***9.3***	14.4	< 0.21	19.1	55.0	< 0.13	na	na

Table 2
Groundwater Analytical Results for GRO and Detected VOCs
Tank 40 Release Site
Superior Refining Company LLC
Superior, Wisconsin

Well ID / Date	Substance Concentration (µg/l) and Results Qualifier (if any)								
	GRO	**Benzene**	**Ethylbenzene**	**Toluene**	**Xylenes**	**TMBs**	**MTBE**	**Isopropyl-benzene**	**n-Propyl-benzene**
NR 140 PAL	NS	*0.5*	*140*	*160*	*400*	*96*	*12*	NS	NS
NR 140 ES	NS	**5**	**700**	**800**	**2,000**	**480**	60	NS	NS
MW-6/T40									
3/6/2002	NI	NI	NI	NI	NI	NI	NI	NI	NI
9/12/2002	< 50	***6.8***	< 0.53	< 0.84	< 1.83	< 1.33	< 0.87	< 0.66	< 0.95
3/12/2003	370	***170***	8	0.85 J	18.2	6.2	< 0.43	na	na
11/15/2007	4440	***1500***	*396*	< 6.00	*545.3*	*108.1*	< 6.00	na	na
5/27/2008	5420	***2190***	*572*	< 6.00	*666.3*	*157.9*	< 6.00	na	na
11/24/2008	6570	***1840***	***808***	< 6.00	*1092*	*275.2*	*26.2* J	na	na
5/27/2009	6070	***2590***	***866***	< 7.40	*1074*	*257.4*	*24.7* J	na	na
11/23/2009	3900	***1110***	*421*	< 3.70	*691*	*134.5*	< 3.00	na	na
5/19/2010	4470	***1520***	*503*	< 7.40	*635.8*	*169.9*	< 6.00	na	na
10/21/2010	2630	***1110***	*274*	< 7.40	225.4	62.7 J	*12.5* J	na	na
6/16/2011	na	***2010***	*615*	< 8.00	*668.1*	*165.8*	< 10.0	na	na
10/25/2011	na	***584***	100	< 8.00	63.63 J	37.9 J	< 10.0	na	na
5/16/2012	na	***1040***	*249*	< 6.7	140.1	72.2	< 6.1	na	na
8/21/2013	na	***1510***	*607*	< 4.4	373	*183.1* J	< 4.9	na	na
6/24/2014	na	***1600***	*539*	< 12.5	< 374.5	< 49.6	< 4.4	na	na
10/21/2014	na	***233***	56.1	< 1.0	< 81.3	36.1 J	< 0.35	na	na
6/23/2015	na	***1290***	*507*	< 5.0	*552.0*	*138.6*	< 1.7	na	na
10/6/2015	na	***123***	8.8	< 0.50	< 9.3	< 5.3	< 0.17	na	na
5/24/2016	na	***649***	*209*	< 2.0	< 245.0	69.7	< 0.70	na	na
10/5/2016	na	***12.3***	< 0.50	< 0.50	< 1.50	< 1.00	< 0.17	na	na
5/16/2017	na	***607***	*342*	< 2.0	*475.2* J	*109.6*	< 0.70	na	na
10/25/2017	na	*0.63* J	< 0.50	< 0.50	< 1.50	< 1.80	< 0.17	na	na
6/12/2018	na	***1180***	*662*	< 0.50	*824.3*	*278.3*	< 0.17	na	na
10/9/2018	na	< 0.25	< 0.22	< 0.17	< 0.73	< 1.71	< 1.2	na	na
5/21/2019	na	***347***	*195*	< 0.17	< 249.26	75.2	< 1.2	na	na
10/9/2019	na	***9.4***	< 0.22	< 0.17	< 0.73	< 1.71	< 1.2	na	na
5/27/2020	na	***730***	*459*	< 1.3	*470*	*156.9*	< 6.2	na	na
10/6/2020	na	***222***	2.6	< 0.24	< 0.57	1.82 a	< 0.23	na	na
5/24/2021	na	***930***	*646*	< 1.4	*710*	*223.3*	< 5.6	na	na
10/4/2021	na	***150***	3.0	< 0.11	0.56 J	< 0.22	< 0.18	na	na
5/25/2022	na	***576***	*384*	< 0.10	264	*130*	< 0.13	na	na
10/11/2022	na	*1.5*	0.20 J	< 0.10	0.32 J	1.11	< 0.13	na	na
5/30/2023	na	***528***	*237*	< 0.10	166	86.4	< 0.13	na	na
10/16/2023	na	*0.59* J	< 0.11	< 0.21	< 0.42	< 0.24	< 0.13	na	na

Table 2
Groundwater Analytical Results for GRO and Detected VOCs
Tank 40 Release Site
Superior Refining Company LLC
Superior, Wisconsin

Well ID / Date	Substance Concentration (µg/l) and Results Qualifier (if any)								
	GRO	**Benzene**	**Ethylbenzene**	**Toluene**	**Xylenes**	**TMBs**	**MTBE**	**Isopropyl-benzene**	**n-Propyl-benzene**
NR 140 PAL	NS	*0.5*	*140*	*160*	*400*	*96*	*12*	NS	NS
NR 140 ES	NS	**5**	**700**	**800**	**2,000**	**480**	60	NS	NS
MW-7/T40									
3/6/2002	NI	NI	NI	NI	NI	NI	NI	NI	NI
9/12/2002	46000	***12000***	***3100***	***13000***	***9700***	***1410***	< 87	150 J	220 J
3/12/2003	48000	***10000***	***2800***	***11000***	***8900***	***1540***	< 22	na	na
11/15/2007	56300	***8940***	***2190***	***12100***	***9870***	***2167***	< 60.0	na	na
5/27/2008	112000	***11100***	***3180***	***15500***	***18370***	***6110***	< 60.0	na	na
11/24/2008	38800	***6620***	***1280***	***7970***	***9270***	***2402***	< 60.0	na	na
5/27/2009	51000	***9480***	***2010***	***10800***	***11120***	***2227***	< 60.0	na	na
11/23/2009	37000	***6640***	***1090***	***7000***	***9020***	***1922***	< 30.0	na	na
5/19/2010	33300	***6050***	***814***	***5380***	***7580***	***1869***	< 60.0	na	na
10/21/2010	248000	***7900***	***4560***	***10400***	***34300***	***17700***	< 60.0	na	na
6/16/2011	na	***6110***	*511*	***4430***	***5060***	***896***	< 100	na	na
10/25/2011	na	***5490***	***1750***	***5590***	***9310***	***2175***	< 100	na	na
5/16/2012	na	***5090***	***1570***	***4220***	***11330***	***6170***	< 24.4	na	na
8/21/2013	na	***5400***	***1700***	***2400***	***9450***	***2424***	< 9.9	na	na
6/24/2014	na	***4680***	***893***	***1010***	***6090***	***1043***	< 8.7	na	na
10/21/2014	na	***2870***	*651*	*266*	***4740***	***881***	< 8.7	na	na
6/23/2015	na	***3660***	***733***	*167*	***4890***	***920***	< 7.0	na	na
10/6/2015	na	***2150***	*513*	39.3 J	***3410***	***607***	< 7.0	na	na
5/24/2016	na	***2710***	*351*	< 10.0	***2415***	*452*	< 3.5	na	na
10/5/2016	na	***506***	71.0	5.2	*1148*	*280.3*	< 0.87	na	na
5/16/2017	na	***2670***	*528*	25.8	***3234***	***541***	< 3.5	na	na
10/25/2017	na	***1220***	113	< 10.0	***2101***	***565***	< 3.5	na	na
6/12/2018	na	***934***	71.4	< 10.0	*1141*	*279.7*	< 3.5	na	na
10/9/2018	na	***275***	33.3	1.9 J	376.3	*120.2*	< 2.5	na	na
5/21/2019	na	***802***	*189*	4.4 J	*809*	*187.0*	< 2.5	na	na
10/9/2019	na	***4850***	***1200***	5.6 J	***4262***	***1091***	< 12.5	na	na
5/27/2020	na	***220***	54.4	0.48 J	162	55.5	< 1.2	na	na
10/6/2020	na	***4610***	***1280***	2.6	***5030***	***1351***	< 0.12	na	na
5/24/2021	na	***157***	29.8	< 0.72	122	37.0	< 2.8	na	na
10/4/2021	na	***700***	*182*	1.6	*921*	*336*	< 0.18	na	na
5/25/2022	na	***3710***	***1110***	1.1 J	***3660***	***1166***	< 0.63	na	na
10/11/2022	na	***213***	61.5	0.68 J	165	*104.7*	< 0.25	na	na
5/30/2023	na	***2020***	***774***	0.92 J	***2610***	***830***	< 0.25	na	na
10/16/2023	na	***208***	20.4	0.63 J	172	*116.6*	< 0.25	na	na

Table 2
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Tank 40 Release Site
Superior Refining Company LLC
Superior, Wisconsin

Well ID / Date	Substance Concentration (µg/ℓ) and Results Qualifier (if any)								
	GRO	**Benzene**	**Ethylbenzene**	**Toluene**	**Xylenes**	**TMBs**	**MTBE**	**Isopropyl-benzene**	**n-Propyl-benzene**
NR 140 PAL	NS	*0.5*	*140*	*160*	*400*	*96*	*12*	NS	NS
NR 140 ES	NS	**5**	**700**	**800**	**2,000**	**480**	60	NS	NS
TS-1/T40 (recovery sump installed in a groundwater interceptor trench)									
9/30/2004	4300	***140***	*480*	6.7	*529*	***530***	0.94 J	na	na
5/26/2005	1510	***30.4***	< 2.50	105	*519*	*208.4*	< 1.50	na	na
11/9/2005	3120	***125***	*312*	< 15.0	318.9	***666***	< 15.0	na	na
11/16/2006	1020	***139***	61.8	< 0.300	44.08	*224.8*	< 0.300	na	na
11/15/2007	3790	***348***	*681*	< 3.00	*773*	*350.9*	< 3.00	na	na
5/27/2008	4140	***275***	*555*	15.1	*549*	***645.4***	< 3.00	na	na
11/24/2008	1020	***80.1***	*158*	7.28 J	137.2	*178.2*	< 3.00	na	na
5/27/2009	655	***103***	15.1	< 0.370	7.40	13.74	1.68 J	na	na
11/23/2009	462	***67***	20.5	4.64	6.78	17.916	< 0.300	na	na
5/19/2010	803	***127***	83.8	< 0.370	33.07	76.9	1.61 J	na	na
10/21/2010	< 50.0	< 0.310	< 0.500	< 0.370	< 1.390	< 0.84	< 0.300	na	na
6/16/2011	na	***54.9***	84.0	< 0.40	67.32	62.29	< 0.50	na	na
10/25/2011	na	***393***	*152*	< 4.00	84.1	*147.0*	< 5.00	na	na
5/16/2012	na	***229***	103	< 1.7	59.2	35.6	< 1.5	na	na
8/21/2013	na	***41.2***	12.2	< 0.44	4.6	14.6 J	< 0.49	na	na
10/21/2014	na	< 0.50	< 0.50	< 0.50	< 1.50	< 1.00	< 0.17	na	na
6/23/2015	na	***34.9***	1.9	< 0.50	< 1.50	2.29 J	< 0.17	na	na
10/6/2015	na	*4.6*	1.1	< 0.50	< 1.50	10.9	< 0.17	na	na
5/24/2016	na	***73.4***	78.2	< 0.50	< 32.60	64.0	< 0.17	na	na
10/5/2016	na	*1.6*	< 0.50	< 0.50	< 1.50	3.0	< 0.17	na	na
5/16/2017	na	*0.67* J	1.0	< 0.50	< 1.50	3.2	< 0.17	na	na
10/25/2017	na	*2.2*	1.0	< 0.50	1.80 J	6.5	< 0.17	na	na
6/12/2018	na	***20.9***	2.2	< 0.50	2.00 J	6.6	< 0.17	na	na
10/9/2018	na	*2.1*	< 0.22	< 0.17	< 0.73	< 1.71	< 1.2	na	na
5/21/2019	na	***10.1***	2.5	< 0.17	< 1.00 J	3.5 J	< 1.2	na	na
10/9/2019	na	*0.64* J	< 0.22	< 0.17	< 0.73	< 1.71	< 1.2	na	na
5/27/2020	Recovery sump not sampled. Recovery sump accidentally omitted from sampling event.								
10/6/2020	Recovery sump not sampled. Recovery sump accidentally omitted from sampling event.								
6/2/2021	na	< 0.30	< 0.33	< 0.29	< 1.0	< 0.81	< 1.1	na	na
10/4/2021	na	***20.5***	0.79	< 0.11	2.3	9.4 a	< 0.18	na	na
5/25/2022	na	***306***	*207*	< 0.10	0.56 J	*133*	< 0.13	na	na
10/11/2022	na	0.19 J	0.12 J	< 0.10	< 0.20	0.25 a	< 0.13	na	na
5/30/2023	na	***25.5***	14.0	< 0.10	0.26 J	88.6	< 0.13	na	na
10/16/2023	na	*2.0*	< 0.11	< 0.21	< 0.42	< 0.24	< 0.13	na	na

NOTES:

Concentrations are in micrograms per liter (µg/ℓ).

Detected concentrations at or above an applicable NR 140 PAL are in **bold** font; those at or above an NR 140 ES are in *italicized* font.

Any non-detect concentration included was added at the detection limit for both xylenes and TMBs.

Prior to 2020, duplicate sample results were averaged for statistical analysis/plotting, per December 2013 Interstate Technology & Regulatory Council guidance.

Initial round of samples collected from each well were analyzed for VOCs, all subsequent samples analyzed for GRO/PVOCs or PVOCs.

Between Sept. 2004 and May 2007, MW-3/T40, MW-6/T40, and MW-7/T40 were temporarily buried as part of the expansion of an access road.

a = Estimated value, calculated using some or all values that are estimates.

FP = Free product encountered; sample not collected.

GRO = Gasoline range organics.

J (Pre 2020) = Estimated concentration below laboratory quantitation level.

J (Post 2020) = Estimated detected value. Either certain QC criteria were not met or the concentration is between the laboratory's detection and quanitation limits.

J- = The result is an estimated quantity and may be biased low.

MTBE = Methyl tertiary butyl ether.

na = Not analyzed.

NI = Not installed.

NR 140 ES = Wisconsin Administrative Code NR 140 Enforcement Standard; 7/1/2015.

NR 140 PAL = Wisconsin Administrative Code NR 140 Preventive Action Limit; 7/1/2015.

NS = No standard.

TMBs = Sum of 1,2,4-Trimethylbenzene and 1,3,5-Trimethylbenzene.

Figures

Tank 40

Newton Creek

Nemadji River

Douglas County

Site Location

Approximate SRC Property Boundaries for Contiguous Operations

Approximate Fenceline Boundaries for Refining-Related Activities

0 750 1,500

Feet

SITE LOCATION
Superior Refining Company LLC (SRC)
Superior, WI

FIGURE 1

Barr Footer: ArcGIS 10.7.1, 2020-09-30 09:20 File: I:\Client\Husky_Energy\Superior_Refinery\Maps\Groundwater_Monitoring\Tank 40\Figure 1 Site Location.mxd User: EMA

General Direction of Groundwater Flow

Monitoring Point (July 2001)

Test Pit Sump (July 2000)

Monitoring Well

Twin Ports Geoprobe Soil Sample Location (November 1998)

Interceptor Trench Sump TS-1/T40 Location Installed August 27, 2003

Interceptor Trench Installed on August 27, 2003

Notes:
1. Gray shaded well and geoprobe boring locations have been abandoned.
2. Each monitoring point is 7 feet deep and consists of 4" diameter PVC with 3 feet of slotted PVC screen.
3. The test pit sump (TP-1/T40) is 8 feet deep and consists of 6" diameter PVC with 4 feet of slotted PVC screen.
4. The interceptor trench sump (TS-1/T40) is 9.5 feet deep and consists of 5" diameter PVC with 5 feet of slotted PVC.

Source: Gannett Fleming. Sample locations are based on field measurements made by Gannett Fleming and are approximate. Locations were not surveyed.

N

0 10 20

Feet

1 inch = 20 feet

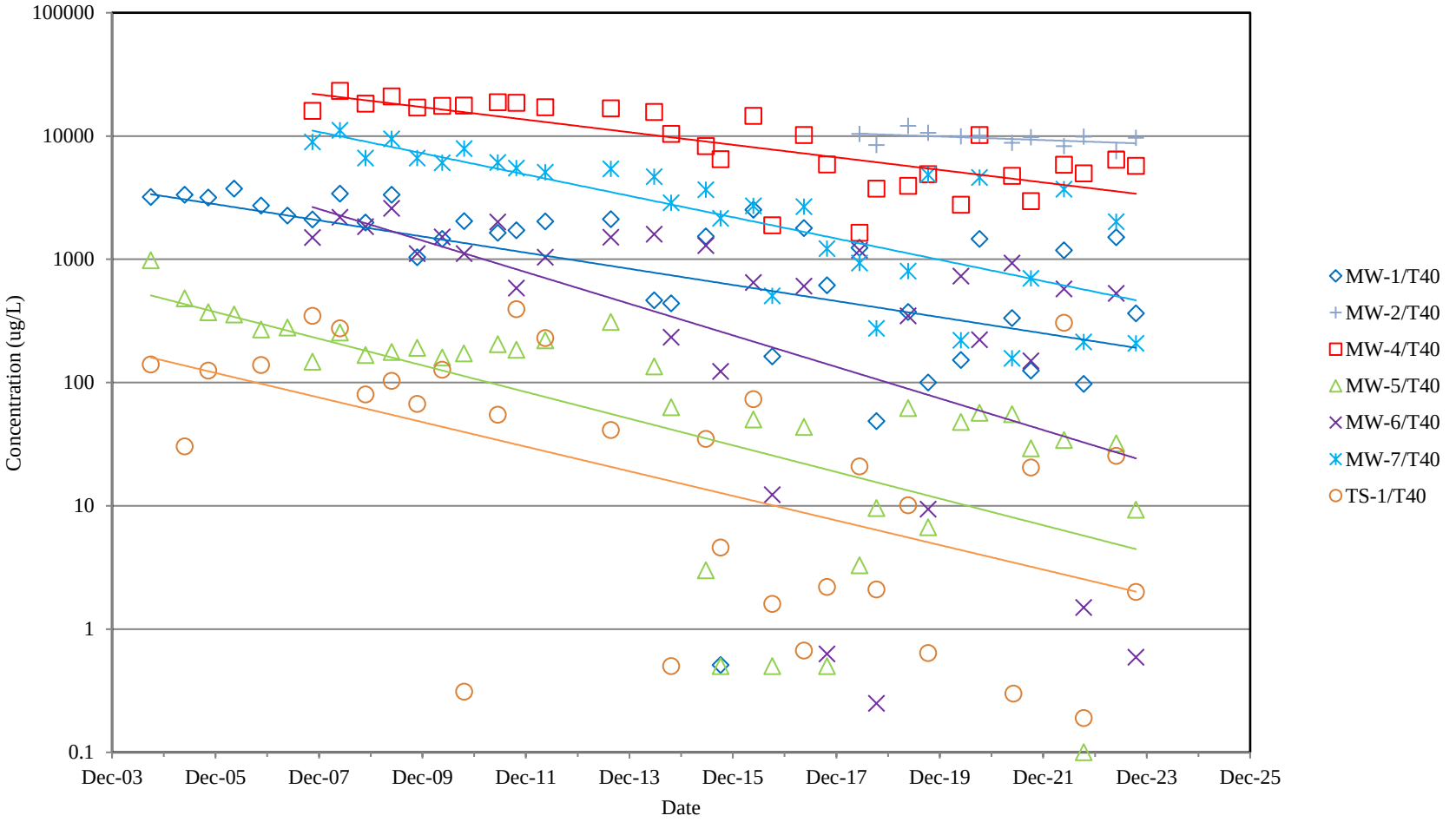
TANK 40 SITE LAYOUT & MONITORING LOCATIONS
Superior Refining Company LLC (SRC)
Superior, WI

FIGURE 2

BARR

Barr Footer: ArcGIS 10.8.1, 2022-11-29 15:41 File: I:\Client\Cenovus_Energy\Superior_Refinery\Maps\Groundwater_Monitoring\Tank 40\Figure 2 Site Layout and Monitoring Locations-Tank 40.mxd User: EMA

FIGURE 3



Note: Best-fit exponential trend lines generated using Excel and non-detect concentrations (if any) plotted at detection limit.

BENZENE GROUNDWATER CONCENTRATIONS TANK 40 BASIN

SUPERIOR REFINING COMPANY LLC
SUPERIOR, WISCONSIN

*Plotted data for MW-1/T40, MW-2/T40, and MW-4/T40 only includes the time since measurable free product was most recently encountered.

Attachments

Attachment A

Pace Analytical Laboratory Reports

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

June 07, 2023

Jim Taraldsen
Barr Engineering Company
325 S Lake Ave
Duluth, MN 55802

RE: Project: 49161494.03 100 102 SRC GWTK40
Pace Project No.: 10655626

Dear Jim Taraldsen:

Enclosed are the analytical results for sample(s) received by the laboratory on June 01, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Martha Hansen
martha.hansen@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Barr DM, Barr Engineering
Accounts Payable, Barr Engineering

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 49161494.03 100 102 SRC GWTK40
Pace Project No.: 10655626

Pace Analytical Services, LLC - Minneapolis MN
1700 Elm Street SE, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Tribal Water Systems+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
GMP+ Certification #: GMP050884
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Minnesota Dept of Ag Approval: via MN 027-053-137
Minnesota Petrofund Registration #: 1240
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification (A2LA) #: R-036
North Dakota Certification (MN) #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification (1700) #: CL101
Oklahoma Certification #: 9507
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Vermont Certification #: VT-027053137
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 49161494.03 100 102 SRC GWTK40
Pace Project No.: 10655626

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10655626001	**MW-1/T40**	Water	05/30/23 08:35	06/01/23 10:55
10655626002	**MW-2/T40**	Water	05/30/23 08:02	06/01/23 10:55
10655626003	**MW-4/T40**	Water	05/30/23 08:23	06/01/23 10:55
10655626004	**MW-5/T40**	Water	05/30/23 07:55	06/01/23 10:55
10655626005	**MW-6/T40**	Water	05/30/23 08:08	06/01/23 10:55
10655626006	**MW-7/T40**	Water	05/30/23 08:13	06/01/23 10:55
10655626007	**TS-1/T40**	Water	05/30/23 07:45	06/01/23 10:55
10655626008	**Trip Blank**	Water	05/30/23 00:00	06/01/23 10:55

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 49161494.03 100 102 SRC GWTK40
Pace Project No.: 10655626

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10655626001	**MW-1/T40**	EPA 8260D	LPM, PAB	10	PASI-M
10655626002	**MW-2/T40**	EPA 8260D	LPM	10	PASI-M
10655626003	**MW-4/T40**	EPA 8260D	LPM	10	PASI-M
10655626004	**MW-5/T40**	EPA 8260D	LPM	10	PASI-M
10655626005	**MW-6/T40**	EPA 8260D	LPM, PAB	10	PASI-M
10655626006	**MW-7/T40**	EPA 8260D	LPM, PAB	10	PASI-M
10655626007	**TS-1/T40**	EPA 8260D	LPM	10	PASI-M
10655626008	**Trip Blank**	EPA 8260D	LPM	10	PASI-M

PASI-M = Pace Analytical Services - Minneapolis

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 49161494.03 100 102 SRC GWTK40
Pace Project No.: 10655626

Sample: MW-1/T40 **Lab ID: 10655626001** Collected: 05/30/23 08:35 Received: 06/01/23 10:55 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV UST	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Benzene	**1510**	ug/L	20.0	2.1	20		06/06/23 17:01	71-43-2	
Ethylbenzene	**975**	ug/L	20.0	2.2	20		06/06/23 17:01	100-41-4	
Methyl-tert-butyl ether	**<0.25**	ug/L	2.0	0.25	2		06/03/23 05:26	1634-04-4	
Toluene	**0.51J**	ug/L	2.0	0.21	2		06/03/23 05:26	108-88-3	
1,2,4-Trimethylbenzene	**914**	ug/L	20.0	2.6	20		06/06/23 17:01	95-63-6	
1,3,5-Trimethylbenzene	**276**	ug/L	2.0	0.23	2		06/03/23 05:26	108-67-8	
Xylene (Total)	**4120**	ug/L	60.0	4.0	20		06/06/23 17:01	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	100	%.	75-125		2		06/03/23 05:26	2199-69-1	D4
4-Bromofluorobenzene (S)	99	%.	75-125		2		06/03/23 05:26	460-00-4	
Toluene-d8 (S)	103	%.	75-125		2		06/03/23 05:26	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 49161494.03 100 102 SRC GWTK40
Pace Project No.: 10655626

Sample: MW-2/T40 **Lab ID: 10655626002** Collected: 05/30/23 08:02 Received: 06/01/23 10:55 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV UST	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Benzene	**7560**	ug/L	100	10.3	100		06/03/23 06:11	71-43-2	P6
Ethylbenzene	**896**	ug/L	100	10.9	100		06/03/23 06:11	100-41-4	
Methyl-tert-butyl ether	**<12.6**	ug/L	100	12.6	100		06/03/23 06:11	1634-04-4	
Toluene	**21.8J**	ug/L	100	10.3	100		06/03/23 06:11	108-88-3	
1,2,4-Trimethylbenzene	**1110**	ug/L	100	13.0	100		06/03/23 06:11	95-63-6	
1,3,5-Trimethylbenzene	**324**	ug/L	100	11.3	100		06/03/23 06:11	108-67-8	
Xylene (Total)	**7440**	ug/L	300	19.9	100		06/03/23 06:11	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	100	%.	75-125		100		06/03/23 06:11	2199-69-1	D4
4-Bromofluorobenzene (S)	100	%.	75-125		100		06/03/23 06:11	460-00-4	
Toluene-d8 (S)	102	%.	75-125		100		06/03/23 06:11	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 49161494.03 100 102 SRC GWTK40
Pace Project No.: 10655626

Sample: MW-4/T40 **Lab ID: 10655626003** Collected: 05/30/23 08:23 Received: 06/01/23 10:55 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV UST	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Benzene	**6420**	ug/L	50.0	5.2	50		06/03/23 05:56	71-43-2	
Ethylbenzene	**546**	ug/L	50.0	5.4	50		06/03/23 05:56	100-41-4	
Methyl-tert-butyl ether	**<6.3**	ug/L	50.0	6.3	50		06/03/23 05:56	1634-04-4	
Toluene	**<5.2**	ug/L	50.0	5.2	50		06/03/23 05:56	108-88-3	
1,2,4-Trimethylbenzene	**1050**	ug/L	50.0	6.5	50		06/03/23 05:56	95-63-6	
1,3,5-Trimethylbenzene	**266**	ug/L	50.0	5.6	50		06/03/23 05:56	108-67-8	
Xylene (Total)	**3430**	ug/L	150	10	50		06/03/23 05:56	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	99	%.	75-125		50		06/03/23 05:56	2199-69-1	D4
4-Bromofluorobenzene (S)	100	%.	75-125		50		06/03/23 05:56	460-00-4	
Toluene-d8 (S)	102	%.	75-125		50		06/03/23 05:56	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 49161494.03 100 102 SRC GWTK40
Pace Project No.: 10655626

Sample: MW-5/T40 **Lab ID: 10655626004** Collected: 05/30/23 07:55 Received: 06/01/23 10:55 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV UST	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Benzene	**32.2**	ug/L	1.0	0.10	1		06/03/23 04:12	71-43-2	
Ethylbenzene	**121**	ug/L	1.0	0.11	1		06/03/23 04:12	100-41-4	
Methyl-tert-butyl ether	**<0.13**	ug/L	1.0	0.13	1		06/03/23 04:12	1634-04-4	
Toluene	**<0.10**	ug/L	1.0	0.10	1		06/03/23 04:12	108-88-3	
1,2,4-Trimethylbenzene	**180**	ug/L	1.0	0.13	1		06/03/23 04:12	95-63-6	
1,3,5-Trimethylbenzene	**20.6**	ug/L	1.0	0.11	1		06/03/23 04:12	108-67-8	
Xylene (Total)	**193**	ug/L	3.0	0.20	1		06/03/23 04:12	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	100	%.	75-125		1		06/03/23 04:12	2199-69-1	
4-Bromofluorobenzene (S)	101	%.	75-125		1		06/03/23 04:12	460-00-4	
Toluene-d8 (S)	102	%.	75-125		1		06/03/23 04:12	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 49161494.03 100 102 SRC GWTK40
Pace Project No.: 10655626

Sample: MW-6/T40 **Lab ID: 10655626005** Collected: 05/30/23 08:08 Received: 06/01/23 10:55 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV UST	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Benzene	**528**	ug/L	5.0	0.52	5		06/06/23 16:31	71-43-2	
Ethylbenzene	**237**	ug/L	5.0	0.54	5		06/06/23 16:31	100-41-4	
Methyl-tert-butyl ether	**<0.13**	ug/L	1.0	0.13	1		06/03/23 04:26	1634-04-4	
Toluene	**<0.10**	ug/L	1.0	0.10	1		06/03/23 04:26	108-88-3	
1,2,4-Trimethylbenzene	**77.7**	ug/L	1.0	0.13	1		06/03/23 04:26	95-63-6	
1,3,5-Trimethylbenzene	**8.7**	ug/L	1.0	0.11	1		06/03/23 04:26	108-67-8	
Xylene (Total)	**166**	ug/L	3.0	0.20	1		06/03/23 04:26	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	98	%.	75-125		1		06/03/23 04:26	2199-69-1	
4-Bromofluorobenzene (S)	101	%.	75-125		1		06/03/23 04:26	460-00-4	
Toluene-d8 (S)	100	%.	75-125		1		06/03/23 04:26	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 49161494.03 100 102 SRC GWTK40
Pace Project No.: 10655626

Sample: MW-7/T40 **Lab ID: 10655626006** Collected: 05/30/23 08:13 Received: 06/01/23 10:55 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV UST	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Benzene	**2020**	ug/L	20.0	2.1	20		06/06/23 17:16	71-43-2	
Ethylbenzene	**774**	ug/L	20.0	2.2	20		06/06/23 17:16	100-41-4	
Methyl-tert-butyl ether	**<0.25**	ug/L	2.0	0.25	2		06/03/23 05:41	1634-04-4	
Toluene	**0.92J**	ug/L	2.0	0.21	2		06/03/23 05:41	108-88-3	
1,2,4-Trimethylbenzene	**641**	ug/L	20.0	2.6	20		06/06/23 17:16	95-63-6	
1,3,5-Trimethylbenzene	**189**	ug/L	2.0	0.23	2		06/03/23 05:41	108-67-8	
Xylene (Total)	**2610**	ug/L	60.0	4.0	20		06/06/23 17:16	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	98	%.	75-125		2		06/03/23 05:41	2199-69-1	D4
4-Bromofluorobenzene (S)	99	%.	75-125		2		06/03/23 05:41	460-00-4	
Toluene-d8 (S)	101	%.	75-125		2		06/03/23 05:41	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 49161494.03 100 102 SRC GWTK40
Pace Project No.: 10655626

Sample: TS-1/T40 **Lab ID: 10655626007** Collected: 05/30/23 07:45 Received: 06/01/23 10:55 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV UST	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Benzene	**25.5**	ug/L	1.0	0.10	1		06/03/23 04:41	71-43-2	
Ethylbenzene	**14.0**	ug/L	1.0	0.11	1		06/03/23 04:41	100-41-4	
Methyl-tert-butyl ether	**<0.13**	ug/L	1.0	0.13	1		06/03/23 04:41	1634-04-4	
Toluene	**<0.10**	ug/L	1.0	0.10	1		06/03/23 04:41	108-88-3	
1,2,4-Trimethylbenzene	**88.5**	ug/L	1.0	0.13	1		06/03/23 04:41	95-63-6	
1,3,5-Trimethylbenzene	**<0.11**	ug/L	1.0	0.11	1		06/03/23 04:41	108-67-8	
Xylene (Total)	**0.26J**	ug/L	3.0	0.20	1		06/03/23 04:41	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	100	%.	75-125		1		06/03/23 04:41	2199-69-1	
4-Bromofluorobenzene (S)	101	%.	75-125		1		06/03/23 04:41	460-00-4	
Toluene-d8 (S)	102	%.	75-125		1		06/03/23 04:41	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 49161494.03 100 102 SRC GWTK40
Pace Project No.: 10655626

Sample: Trip Blank **Lab ID: 10655626008** Collected: 05/30/23 00:00 Received: 06/01/23 10:55 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV UST	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Benzene	**<0.10**	ug/L	1.0	0.10	1		06/03/23 04:56	71-43-2	
Ethylbenzene	**<0.11**	ug/L	1.0	0.11	1		06/03/23 04:56	100-41-4	
Methyl-tert-butyl ether	**<0.13**	ug/L	1.0	0.13	1		06/03/23 04:56	1634-04-4	
Toluene	**<0.10**	ug/L	1.0	0.10	1		06/03/23 04:56	108-88-3	
1,2,4-Trimethylbenzene	**0.17J**	ug/L	1.0	0.13	1		06/03/23 04:56	95-63-6	
1,3,5-Trimethylbenzene	**<0.11**	ug/L	1.0	0.11	1		06/03/23 04:56	108-67-8	
Xylene (Total)	**<0.20**	ug/L	3.0	0.20	1		06/03/23 04:56	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	99	%.	75-125		1		06/03/23 04:56	2199-69-1	
4-Bromofluorobenzene (S)	101	%.	75-125		1		06/03/23 04:56	460-00-4	
Toluene-d8 (S)	102	%.	75-125		1		06/03/23 04:56	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 49161494.03 100 102 SRC GWTK40
Pace Project No.: 10655626

QC Batch: 884896
QC Batch Method: EPA 8260D
Analysis Method: EPA 8260D
Analysis Description: 8260D MSV UST-WATER
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10655626001, 10655626002, 10655626003, 10655626004, 10655626005, 10655626006, 10655626007, 10655626008

METHOD BLANK: 4662744 Matrix: Water
Associated Lab Samples: 10655626001, 10655626002, 10655626003, 10655626004, 10655626005, 10655626006, 10655626007, 10655626008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	<0.13	1.0	06/03/23 01:13	
1,3,5-Trimethylbenzene	ug/L	<0.11	1.0	06/03/23 01:13	
Benzene	ug/L	<0.10	1.0	06/03/23 01:13	
Ethylbenzene	ug/L	<0.11	1.0	06/03/23 01:13	
Methyl-tert-butyl ether	ug/L	<0.13	1.0	06/03/23 01:13	
Toluene	ug/L	<0.10	1.0	06/03/23 01:13	
Xylene (Total)	ug/L	<0.20	3.0	06/03/23 01:13	
1,2-Dichlorobenzene-d4 (S)	%.	100	75-125	06/03/23 01:13	
4-Bromofluorobenzene (S)	%.	100	75-125	06/03/23 01:13	
Toluene-d8 (S)	%.	101	75-125	06/03/23 01:13	

LABORATORY CONTROL SAMPLE: 4662745

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	18.1	91	75-125	
1,3,5-Trimethylbenzene	ug/L	20	18.2	91	75-125	
Benzene	ug/L	20	18.0	90	75-125	
Ethylbenzene	ug/L	20	18.0	90	75-125	
Methyl-tert-butyl ether	ug/L	20	19.2	96	75-125	
Toluene	ug/L	20	18.0	90	74-125	
Xylene (Total)	ug/L	60	55.5	92	75-125	
1,2-Dichlorobenzene-d4 (S)	%.			101	75-125	
4-Bromofluorobenzene (S)	%.			101	75-125	
Toluene-d8 (S)	%.			100	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4662755 4662756

Parameter	Units	10655626002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2,4-Trimethylbenzene	ug/L	1110	2000	2000	2800	2660	85	78	61-143	5	30	
1,3,5-Trimethylbenzene	ug/L	324	2000	2000	2020	1900	85	79	70-134	6	30	
Benzene	ug/L	7560	2000	2000	9100	8640	77	54	66-127	5	30	P6
Ethylbenzene	ug/L	896	2000	2000	2560	2460	83	78	74-128	4	30	
Methyl-tert-butyl ether	ug/L	<12.6	2000	2000	1760	1750	88	87	65-132	1	30	
Toluene	ug/L	21.8J	2000	2000	1660	1570	82	77	66-125	6	30	
Xylene (Total)	ug/L	7440	6000	6000	12400	12000	83	76	75-126	4	30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 49161494.03 100 102 SRC GWTK40
Pace Project No.: 10655626

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4662755 4662756

Parameter	Units	10655626002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2-Dichlorobenzene-d4 (S)	%.						101	100	75-125			
4-Bromofluorobenzene (S)	%.						101	102	75-125			
Toluene-d8 (S)	%.						101	99	75-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 49161494.03 100 102 SRC GWTK40
Pace Project No.: 10655626

QC Batch: 885398
QC Batch Method: EPA 8260D
Analysis Method: EPA 8260D
Analysis Description: 8260D MSV UST-WATER
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10655626001, 10655626005, 10655626006

METHOD BLANK: 4665765 Matrix: Water
Associated Lab Samples: 10655626001, 10655626005, 10655626006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	<0.13	1.0	06/06/23 14:26	
Benzene	ug/L	<0.10	1.0	06/06/23 14:26	
Ethylbenzene	ug/L	<0.11	1.0	06/06/23 14:26	
Xylene (Total)	ug/L	<0.20	3.0	06/06/23 14:26	
1,2-Dichlorobenzene-d4 (S)	%.	100	75-125	06/06/23 14:26	
4-Bromofluorobenzene (S)	%.	101	75-125	06/06/23 14:26	
Toluene-d8 (S)	%.	102	75-125	06/06/23 14:26	

LABORATORY CONTROL SAMPLE: 4665766

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	17.2	86	75-125	
Benzene	ug/L	20	17.0	85	75-125	
Ethylbenzene	ug/L	20	17.3	87	75-125	
Xylene (Total)	ug/L	60	53.4	89	75-125	
1,2-Dichlorobenzene-d4 (S)	%.			99	75-125	
4-Bromofluorobenzene (S)	%.			101	75-125	
Toluene-d8 (S)	%.			100	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4665804 4665805

Parameter	Units	10655608004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2,4-Trimethylbenzene	ug/L	34.0	200	200	218	217	92	92	61-143	0	30	
Benzene	ug/L	1020	200	200	1180	1160	79	71	66-127	1	30	
Ethylbenzene	ug/L	68.5	200	200	241	242	86	87	74-128	0	30	
Xylene (Total)	ug/L	218	600	600	755	761	90	90	75-126	1	30	
1,2-Dichlorobenzene-d4 (S)	%.						100	100	75-125			
4-Bromofluorobenzene (S)	%.						101	100	75-125			
Toluene-d8 (S)	%.						100	98	75-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 49161494.03 100 102 SRC GWTK40
Pace Project No.: 10655626

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

DL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

D4	Sample was diluted due to the presence of high levels of target analytes.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 49161494.03 100 102 SRC GWTK40
Pace Project No.: 10655626

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10655626001	**MW-1/T40**	EPA 8260D	884896		
10655626001	**MW-1/T40**	EPA 8260D	885398		
10655626002	**MW-2/T40**	EPA 8260D	884896		
10655626003	**MW-4/T40**	EPA 8260D	884896		
10655626004	**MW-5/T40**	EPA 8260D	884896		
10655626005	**MW-6/T40**	EPA 8260D	884896		
10655626005	**MW-6/T40**	EPA 8260D	885398		
10655626006	**MW-7/T40**	EPA 8260D	884896		
10655626006	**MW-7/T40**	EPA 8260D	885398		
10655626007	**TS-1/T40**	EPA 8260D	884896		
10655626008	**Trip Blank**	EPA 8260D	884896		

Barr Engineering Co. Chain of Custody

Sample Origination State
☐ CO ☐ MI ☐ MN ☐ MO ☐ ND ☐ NV ☐ TX ☐ UT ☑ WI ☐ WY ☐ Other: _____

COC Number: **№ 591714**
COC 1 of 1

REPORT TO	INVOICE TO
Company: Barr Engineering Co.	Company: Barr
Address: 325 South Lake Ave	Address:
Address: Duluth, MN 55802	Address:
Name: Lynette Carney	Name:
email: lcarney@barr.com	email:
Copy to: BarrDM@barr.com	P.O.
Project Name: SRC GW TK 40	Barr Project No: 49161494.03 100 102

Matrix Code: GW = Groundwater
Preservative Code: A = None
SD = Sediment SQ = MeOH blank OTH = Other (Oil, etc.) J = Zn Acetate K = Other

WO#: 10655626
10655626

Location	Sample Depth Start	Stop	Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix Code	Perform MS/MSD Y / N	Total Number Of Containers	Analysis Requested: Water: 8VOCs	Water: B	Water: N	Soil: % Solids	Preservative Code	Field Filtered Y/N
1. mw-1 / T40				05/30/2023	8:35	GW	N	3	X				GW1	
2. mw-2 / T40					8:02	GW	N	3	X				GW2	
3. mw-4 / T40					8:23	GW	N	3	X				GW3	
4. mw-5 / T40					7:55	GW	N	3	X				GW4	
5. mw-6 / T40					8:08	GW	N	3	X				GW5	
6. mw-7 / T40					8:13	GW	N	3	X				GW6	
7. TS-1 / T40					7:45	GW	N	3	X				GW7	
8. Trip Blank					—	WQ	N	2	X				GW8	
9.														
10.														

BARR USE ONLY
Sampled by: KLS3
Barr Proj. Manager: LMC
Barr DQ Manager: JET
Lab Name: Pace
Lab Location: Minneapolis

Relinquished by:	On Ice?	Date	Time	Received by:	Date	Time
Kinsey Schneider	(Y) N	5/31/2023	13:56	Gareth Hagman	5/31/23	13:56
Meegan Ackers	(Y) N	5/31/23	14:29 MAS 5/31/23	Mega at UPS	6/1/23	1035

Samples Shipped VIA: ☐ Ground Courier ☐ Air Carrier ☐ Sampler ☐ Other: _____
Air Bill Number:
Lab WO:
Temperature on Receipt (°C): 4.2 Custody Seal Intact? ☐ Y ☐ N ☑ None

Requested Due Date:
☒ Standard Turn Around Time
☐ Rush _____ (mm/dd/yyyy)

Distribution - White-Original: Accompanies Shipment to Laboratory; Yellow Copy: Include in Field Documents; Scan and email: a copy to BarrDM@barr.com for tracking and filing procedures

H:\RLG\STDFORMS\Chain of Custody Form 2015 RLG Rev. 01/30/2020

Sample Condition Upon Receipt

Client Name: Barr Engineering Co.

Project #: **WO#: 10655626**

PM: MKH **Due Date: 06/15/23**
CLIENT: BARR

Courier: ☐ FedEx ☐ UPS ☐ USPS ☑ Client ☐ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: _____ ☐ See Exceptions ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Packing Material: ☑ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other **Temp Blank?** ☑ Yes ☐ No

Thermometer: ☐ T1 (0461) ☐ T2 (0436) ☐ T3 (0459) ☐ T4 (0402) ☐ T5 (0178) ☐ T6 (0235) ☑ T7 (0042) ☐ T8 (0775) ☐ T9(0727) ☐ 01339252/1710

Type of Ice: ☑ Wet ☐ Blue ☐ Dry ☐ None ☐ Melted

Did Samples Originate in West Virginia? ☐ Yes ☑ No **Were All Container Temps Taken?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6 °C

Cooler temp Read w/Temp Blank: 0.8 °C

Correction Factor: +0.1 **Cooler Temp Corrected w/temp blank:** 0.9 °C

Average Corrected Temp (no temp blank only): _____ °C ☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

USDA Regulated Soil: (☑ N/A, water sample/other: _____)

Date/Initials of Person Examining Contents: BG2 6/1/23

Did samples originate in a quarantine zone within the United States: AL, AR, AZ CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (ENV-FRM-MIN4-0154) and include with SCUR/COC paperwork.

Location (Check one): ☐ Duluth ☑ Minneapolis ☐ Virginia

				COMMENTS
Chain of Custody Present and Filled Out?	☑ Yes	☐ No		1.
Chain of Custody Relinquished?	☑ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☑ Yes	☐ No		4. If fecal: ☐ <8 hrs ☐ >8 hr, <24 ☐ No
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E.coli ☐ BOD/cBOD ☐ Hex Chrom ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other _____
Rush Turn Around Time Requested?	☐ Yes	☑ No		6.
Sufficient Sample Volume?	☑ Yes	☐ No		7.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	8.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☑ Water ☐ Soil ☐ Oil ☐ Other	☑ Yes	☐ No		11. **If no, write ID/Date/Time of container below:** ☐ See Exceptions ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☑ N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO3, H2SO4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐ Yes	☐ No	☑ N/A	☐ NaOH ☐ HNO3 ☐ H2SO4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxins/PFAS (*If adding preservative to a container, it must be added to associated field and equipment blanks--verify with PM first.)	☑ Yes	☐ No	☐ N/A	Positive for Residual Chlorine? ☐ Yes ☐ No ☐ See Exceptions ENV-FRM-MIN4-0142 **pH Paper Lot #**
				Residual Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Headspace in Methyl Mercury Container?	☐ Yes	☐ No	☑ N/A	13.
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☑ N/A	14. ☐ See Exceptions ENV-FRM-MIN4-0142
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☑ No	☐ N/A	
3 Trip Blanks Present?	☐ Yes	☐ No	☑ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	Pace Trip Blank Lot # (if purchased): _____

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: _____ **Date:** 6/2/23

NOTE: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e., out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled By: BG2 **Line:** 2

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

October 24, 2023

Jim Taraldsen
Barr Engineering Company
325 S Lake Ave
Duluth, MN 55802

RE: Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

Dear Jim Taraldsen:

Enclosed are the analytical results for sample(s) received by the laboratory on October 17, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Martha Hansen
martha.hansen@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Barr DM, Barr Engineering
Accounts Payable, Barr Engineering

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

Pace Analytical Services, LLC - Minneapolis MN
1700 Elm Street SE, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Tribal Water Systems+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
GMP+ Certification #: GMP050884
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Minnesota Dept of Ag Approval: via MN 027-053-137
Minnesota Petrofund Registration #: 1240
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification (A2LA) #: R-036
North Dakota Certification (MN) #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification (1700) #: CL101
Oklahoma Certification #: 9507
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Vermont Certification #: VT-027053137
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10672730001	**MW-1 / T40**	Water	10/16/23 08:20	10/17/23 11:05
10672730002	**TS-1 / T40**	Water	10/16/23 08:33	10/17/23 11:05
10672730003	**MW-5 / T40**	Water	10/16/23 08:41	10/17/23 11:05
10672730004	**MW-6 / T40**	Water	10/16/23 08:50	10/17/23 11:05
10672730005	**MW-7 / T40**	Water	10/16/23 08:56	10/17/23 11:05
10672730006	**MW-2 / T40**	Water	10/16/23 09:06	10/17/23 11:05
10672730007	**MW-4 / T40**	Water	10/16/23 09:19	10/17/23 11:05
10672730008	**Trip Blank**	Water	10/16/23 00:00	10/17/23 11:05

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SAMPLE ANALYTE COUNT

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10672730001	**MW-1 / T40**	EPA 8260D	LPM, TKL	10	PASI-M
10672730002	**TS-1 / T40**	EPA 8260D	TKL	10	PASI-M
10672730003	**MW-5 / T40**	EPA 8260D	LPM	10	PASI-M
10672730004	**MW-6 / T40**	EPA 8260D	TKL	10	PASI-M
10672730005	**MW-7 / T40**	EPA 8260D	LPM	10	PASI-M
10672730006	**MW-2 / T40**	EPA 8260D	NMB	10	PASI-M
10672730007	**MW-4 / T40**	EPA 8260D	NMB	10	PASI-M
10672730008	**Trip Blank**	EPA 8260D	TKL	10	PASI-M

PASI-M = Pace Analytical Services - Minneapolis

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ANALYTICAL RESULTS

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

Sample: MW-1 / T40 **Lab ID: 10672730001** Collected: 10/16/23 08:20 Received: 10/17/23 11:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV UST	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Benzene	**365**	ug/L	2.0	0.43	2		10/18/23 22:00	71-43-2	
Ethylbenzene	**146**	ug/L	2.0	0.22	2		10/18/23 22:00	100-41-4	
Methyl-tert-butyl ether	**<0.25**	ug/L	2.0	0.25	2		10/18/23 22:00	1634-04-4	
Toluene	**0.89J**	ug/L	2.0	0.41	2		10/18/23 22:00	108-88-3	
1,2,4-Trimethylbenzene	**314**	ug/L	2.0	0.26	2		10/18/23 22:00	95-63-6	
1,3,5-Trimethylbenzene	**96.9**	ug/L	2.0	0.23	2		10/18/23 22:00	108-67-8	
Xylene (Total)	**832**	ug/L	15.0	2.1	5		10/19/23 23:07	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	101	%.	75-125		2		10/18/23 22:00	2199-69-1	D4
4-Bromofluorobenzene (S)	103	%.	75-125		2		10/18/23 22:00	460-00-4	
Toluene-d8 (S)	105	%.	75-125		2		10/18/23 22:00	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

Sample: TS-1 / T40 **Lab ID: 10672730002** Collected: 10/16/23 08:33 Received: 10/17/23 11:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV UST	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Benzene	**2.0**	ug/L	1.0	0.21	1		10/18/23 21:15	71-43-2	
Ethylbenzene	**<0.11**	ug/L	1.0	0.11	1		10/18/23 21:15	100-41-4	
Methyl-tert-butyl ether	**<0.13**	ug/L	1.0	0.13	1		10/18/23 21:15	1634-04-4	
Toluene	**<0.21**	ug/L	1.0	0.21	1		10/18/23 21:15	108-88-3	
1,2,4-Trimethylbenzene	**<0.13**	ug/L	1.0	0.13	1		10/18/23 21:15	95-63-6	
1,3,5-Trimethylbenzene	**<0.11**	ug/L	1.0	0.11	1		10/18/23 21:15	108-67-8	
Xylene (Total)	**<0.42**	ug/L	3.0	0.42	1		10/18/23 21:15	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	100	%.	75-125		1		10/18/23 21:15	2199-69-1	
4-Bromofluorobenzene (S)	103	%.	75-125		1		10/18/23 21:15	460-00-4	
Toluene-d8 (S)	104	%.	75-125		1		10/18/23 21:15	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

Sample: MW-5 / T40 **Lab ID: 10672730003** Collected: 10/16/23 08:41 Received: 10/17/23 11:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV UST	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Benzene	**9.3**	ug/L	1.0	0.21	1		10/19/23 22:18	71-43-2	
Ethylbenzene	**14.4**	ug/L	1.0	0.11	1		10/19/23 22:18	100-41-4	
Methyl-tert-butyl ether	**<0.13**	ug/L	1.0	0.13	1		10/19/23 22:18	1634-04-4	
Toluene	**<0.21**	ug/L	1.0	0.21	1		10/19/23 22:18	108-88-3	
1,2,4-Trimethylbenzene	**53.6**	ug/L	1.0	0.13	1		10/19/23 22:18	95-63-6	
1,3,5-Trimethylbenzene	**1.4**	ug/L	1.0	0.11	1		10/19/23 22:18	108-67-8	
Xylene (Total)	**19.1**	ug/L	3.0	0.42	1		10/19/23 22:18	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	100	%.	75-125		1		10/19/23 22:18	2199-69-1	
4-Bromofluorobenzene (S)	100	%.	75-125		1		10/19/23 22:18	460-00-4	
Toluene-d8 (S)	98	%.	75-125		1		10/19/23 22:18	2037-26-5	

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ANALYTICAL RESULTS

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

Sample: MW-6 / T40 **Lab ID: 10672730004** Collected: 10/16/23 08:50 Received: 10/17/23 11:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV UST	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Benzene	**0.59J**	ug/L	1.0	0.21	1		10/18/23 21:30	71-43-2	
Ethylbenzene	**<0.11**	ug/L	1.0	0.11	1		10/18/23 21:30	100-41-4	
Methyl-tert-butyl ether	**<0.13**	ug/L	1.0	0.13	1		10/18/23 21:30	1634-04-4	
Toluene	**<0.21**	ug/L	1.0	0.21	1		10/18/23 21:30	108-88-3	
1,2,4-Trimethylbenzene	**<0.13**	ug/L	1.0	0.13	1		10/18/23 21:30	95-63-6	
1,3,5-Trimethylbenzene	**<0.11**	ug/L	1.0	0.11	1		10/18/23 21:30	108-67-8	
Xylene (Total)	**<0.42**	ug/L	3.0	0.42	1		10/18/23 21:30	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	99	%.	75-125		1		10/18/23 21:30	2199-69-1	
4-Bromofluorobenzene (S)	104	%.	75-125		1		10/18/23 21:30	460-00-4	
Toluene-d8 (S)	104	%.	75-125		1		10/18/23 21:30	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

Sample: MW-7 / T40 **Lab ID: 10672730005** Collected: 10/16/23 08:56 Received: 10/17/23 11:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV UST	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Benzene	**208**	ug/L	2.0	0.43	2		10/19/23 22:35	71-43-2	
Ethylbenzene	**20.4**	ug/L	2.0	0.22	2		10/19/23 22:35	100-41-4	
Methyl-tert-butyl ether	**<0.25**	ug/L	2.0	0.25	2		10/19/23 22:35	1634-04-4	
Toluene	**0.63J**	ug/L	2.0	0.41	2		10/19/23 22:35	108-88-3	
1,2,4-Trimethylbenzene	**93.1**	ug/L	2.0	0.26	2		10/19/23 22:35	95-63-6	
1,3,5-Trimethylbenzene	**23.5**	ug/L	2.0	0.23	2		10/19/23 22:35	108-67-8	
Xylene (Total)	**172**	ug/L	6.0	0.84	2		10/19/23 22:35	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	101	%.	75-125		2		10/19/23 22:35	2199-69-1	D4
4-Bromofluorobenzene (S)	98	%.	75-125		2		10/19/23 22:35	460-00-4	
Toluene-d8 (S)	98	%.	75-125		2		10/19/23 22:35	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

Sample: MW-2 / T40 **Lab ID: 10672730006** Collected: 10/16/23 09:06 Received: 10/17/23 11:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV UST	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Benzene	**9650**	ug/L	100	21.3	100		10/20/23 17:29	71-43-2	
Ethylbenzene	**1540**	ug/L	100	10.9	100		10/20/23 17:29	100-41-4	
Methyl-tert-butyl ether	**<12.6**	ug/L	100	12.6	100		10/20/23 17:29	1634-04-4	
Toluene	**<20.7**	ug/L	100	20.7	100		10/20/23 17:29	108-88-3	
1,2,4-Trimethylbenzene	**1290**	ug/L	100	13.0	100		10/20/23 17:29	95-63-6	
1,3,5-Trimethylbenzene	**359**	ug/L	100	11.3	100		10/20/23 17:29	108-67-8	
Xylene (Total)	**8290**	ug/L	300	41.9	100		10/20/23 17:29	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	99	%.	75-125		100		10/20/23 17:29	2199-69-1	D4
4-Bromofluorobenzene (S)	102	%.	75-125		100		10/20/23 17:29	460-00-4	
Toluene-d8 (S)	98	%.	75-125		100		10/20/23 17:29	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

Sample: MW-4 / T40 **Lab ID: 10672730007** Collected: 10/16/23 09:19 Received: 10/17/23 11:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV UST	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Benzene	**5730**	ug/L	100	21.3	100		10/20/23 17:45	71-43-2	
Ethylbenzene	**374**	ug/L	100	10.9	100		10/20/23 17:45	100-41-4	
Methyl-tert-butyl ether	**<12.6**	ug/L	100	12.6	100		10/20/23 17:45	1634-04-4	
Toluene	**<20.7**	ug/L	100	20.7	100		10/20/23 17:45	108-88-3	
1,2,4-Trimethylbenzene	**1250**	ug/L	100	13.0	100		10/20/23 17:45	95-63-6	
1,3,5-Trimethylbenzene	**301**	ug/L	100	11.3	100		10/20/23 17:45	108-67-8	
Xylene (Total)	**3520**	ug/L	300	41.9	100		10/20/23 17:45	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	97	%.	75-125		100		10/20/23 17:45	2199-69-1	D4
4-Bromofluorobenzene (S)	104	%.	75-125		100		10/20/23 17:45	460-00-4	
Toluene-d8 (S)	98	%.	75-125		100		10/20/23 17:45	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

Sample: Trip Blank **Lab ID: 10672730008** Collected: 10/16/23 00:00 Received: 10/17/23 11:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260D MSV UST	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Benzene	**<0.21**	ug/L	1.0	0.21	1		10/18/23 20:15	71-43-2	
Ethylbenzene	**<0.11**	ug/L	1.0	0.11	1		10/18/23 20:15	100-41-4	
Methyl-tert-butyl ether	**<0.13**	ug/L	1.0	0.13	1		10/18/23 20:15	1634-04-4	
Toluene	**<0.21**	ug/L	1.0	0.21	1		10/18/23 20:15	108-88-3	
1,2,4-Trimethylbenzene	**<0.13**	ug/L	1.0	0.13	1		10/18/23 20:15	95-63-6	
1,3,5-Trimethylbenzene	**<0.11**	ug/L	1.0	0.11	1		10/18/23 20:15	108-67-8	
Xylene (Total)	**<0.42**	ug/L	3.0	0.42	1		10/18/23 20:15	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	99	%.	75-125		1		10/18/23 20:15	2199-69-1	
4-Bromofluorobenzene (S)	102	%.	75-125		1		10/18/23 20:15	460-00-4	
Toluene-d8 (S)	104	%.	75-125		1		10/18/23 20:15	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

QC Batch: 912707
QC Batch Method: EPA 8260D
Analysis Method: EPA 8260D
Analysis Description: 8260D MSV UST-WATER
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10672730001, 10672730002, 10672730004, 10672730008

METHOD BLANK: 4802984 Matrix: Water
Associated Lab Samples: 10672730001, 10672730002, 10672730004, 10672730008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	<0.13	1.0	10/18/23 19:30	
1,3,5-Trimethylbenzene	ug/L	<0.11	1.0	10/18/23 19:30	
Benzene	ug/L	<0.21	1.0	10/18/23 19:30	
Ethylbenzene	ug/L	<0.11	1.0	10/18/23 19:30	
Methyl-tert-butyl ether	ug/L	<0.13	1.0	10/18/23 19:30	
Toluene	ug/L	<0.21	1.0	10/18/23 19:30	
Xylene (Total)	ug/L	<0.42	3.0	10/18/23 19:30	
1,2-Dichlorobenzene-d4 (S)	%.	99	75-125	10/18/23 19:30	
4-Bromofluorobenzene (S)	%.	103	75-125	10/18/23 19:30	
Toluene-d8 (S)	%.	104	75-125	10/18/23 19:30	

LABORATORY CONTROL SAMPLE: 4802985

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	17.0	85	75-125	
1,3,5-Trimethylbenzene	ug/L	20	17.1	86	75-125	
Benzene	ug/L	20	18.4	92	75-125	
Ethylbenzene	ug/L	20	17.5	88	75-125	
Methyl-tert-butyl ether	ug/L	20	19.5	98	75-125	
Toluene	ug/L	20	18.3	92	74-125	
Xylene (Total)	ug/L	60	53.5	89	75-125	
1,2-Dichlorobenzene-d4 (S)	%.			100	75-125	
4-Bromofluorobenzene (S)	%.			104	75-125	
Toluene-d8 (S)	%.			104	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4803009 4803010

Parameter	Units	10672707001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2,4-Trimethylbenzene	ug/L	3100	4000	4000	6880	6710	95	90	61-143	2	30	
1,3,5-Trimethylbenzene	ug/L	828	4000	4000	4540	4410	93	90	70-134	3	30	
Benzene	ug/L	18300	4000	4000	21900	21500	91	81	66-127	2	30	
Ethylbenzene	ug/L	1680	4000	4000	5510	5400	96	93	74-128	2	30	
Methyl-tert-butyl ether	ug/L	<25.2	4000	4000	4190	4200	105	105	65-132	0	30	
Toluene	ug/L	21400	4000	4000	24800	24100	85	68	66-125	3	30	
Xylene (Total)	ug/L	18100	12000	12000	29600	29000	96	91	75-126	2	30	
1,2-Dichlorobenzene-d4 (S)	%.						100	100	75-125			D4

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4803009 4803010

Parameter	Units	10672707001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
4-Bromofluorobenzene (S)	%.						103	104	75-125			
Toluene-d8 (S)	%.						104	104	75-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

QC Batch: 913026
QC Batch Method: EPA 8260D
Analysis Method: EPA 8260D
Analysis Description: 8260D MSV UST-WATER
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10672730001, 10672730003, 10672730005

METHOD BLANK: 4804526 Matrix: Water
Associated Lab Samples: 10672730001, 10672730003, 10672730005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	<0.13	1.0	10/19/23 21:13	
1,3,5-Trimethylbenzene	ug/L	<0.11	1.0	10/19/23 21:13	
Benzene	ug/L	<0.21	1.0	10/19/23 21:13	
Ethylbenzene	ug/L	<0.11	1.0	10/19/23 21:13	
Methyl-tert-butyl ether	ug/L	<0.13	1.0	10/19/23 21:13	
Toluene	ug/L	<0.21	1.0	10/19/23 21:13	
Xylene (Total)	ug/L	<0.42	3.0	10/19/23 21:13	
1,2-Dichlorobenzene-d4 (S)	%.	101	75-125	10/19/23 21:13	
4-Bromofluorobenzene (S)	%.	99	75-125	10/19/23 21:13	
Toluene-d8 (S)	%.	103	75-125	10/19/23 21:13	

LABORATORY CONTROL SAMPLE & LCSD: 4804527 4804528

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	21.2	20.7	106	104	75-125	2	20	
1,3,5-Trimethylbenzene	ug/L	20	22.7	20.5	113	103	75-125	10	20	
Benzene	ug/L	20	20.6	20.5	103	102	75-125	1	20	
Ethylbenzene	ug/L	20	20.7	20.5	104	102	75-125	1	20	
Methyl-tert-butyl ether	ug/L	20	20.2	21.7	101	108	75-125	7	20	
Toluene	ug/L	20	19.4	20.2	97	101	74-125	4	20	
Xylene (Total)	ug/L	60	63.9	63.5	106	106	75-125	1	20	
1,2-Dichlorobenzene-d4 (S)	%.				96	99	75-125			
4-Bromofluorobenzene (S)	%.				100	100	75-125			
Toluene-d8 (S)	%.				97	103	75-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

QC Batch: 913138
QC Batch Method: EPA 8260D
Analysis Method: EPA 8260D
Analysis Description: 8260D MSV UST-WATER
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10672730006, 10672730007

METHOD BLANK: 4805218 Matrix: Water
Associated Lab Samples: 10672730006, 10672730007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	<0.13	1.0	10/20/23 12:42	
1,3,5-Trimethylbenzene	ug/L	<0.11	1.0	10/20/23 12:42	
Benzene	ug/L	<0.21	1.0	10/20/23 12:42	
Ethylbenzene	ug/L	<0.11	1.0	10/20/23 12:42	
Methyl-tert-butyl ether	ug/L	<0.13	1.0	10/20/23 12:42	
Toluene	ug/L	<0.21	1.0	10/20/23 12:42	
Xylene (Total)	ug/L	<0.42	3.0	10/20/23 12:42	
1,2-Dichlorobenzene-d4 (S)	%.	98	75-125	10/20/23 12:42	
4-Bromofluorobenzene (S)	%.	104	75-125	10/20/23 12:42	
Toluene-d8 (S)	%.	99	75-125	10/20/23 12:42	

LABORATORY CONTROL SAMPLE: 4805219

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	20.8	104	75-125	
1,3,5-Trimethylbenzene	ug/L	20	20.8	104	75-125	
Benzene	ug/L	20	20.6	103	75-125	
Ethylbenzene	ug/L	20	20.9	105	75-125	
Methyl-tert-butyl ether	ug/L	20	22.8	114	75-125	
Toluene	ug/L	20	19.8	99	74-125	
Xylene (Total)	ug/L	60	61.9	103	75-125	
1,2-Dichlorobenzene-d4 (S)	%.			99	75-125	
4-Bromofluorobenzene (S)	%.			103	75-125	
Toluene-d8 (S)	%.			98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4805228 4805229

Parameter	Units	10672730006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2,4-Trimethylbenzene	ug/L	1290	2000	2000	3290	3380	100	104	61-143	3	30	
1,3,5-Trimethylbenzene	ug/L	359	2000	2000	2360	2440	100	104	70-134	3	30	
Benzene	ug/L	9650	2000	2000	11400	11600	86	97	66-127	2	30	
Ethylbenzene	ug/L	1540	2000	2000	3590	3660	102	106	74-128	2	30	
Methyl-tert-butyl ether	ug/L	<12.6	2000	2000	2220	2230	111	111	65-132	0	30	
Toluene	ug/L	<20.7	2000	2000	1980	1980	99	99	66-125	0	30	
Xylene (Total)	ug/L	8290	6000	6000	14100	14500	97	103	75-126	2	30	
1,2-Dichlorobenzene-d4 (S)	%.						98	99	75-125			D4

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4805228 4805229

Parameter	Units	10672730006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
4-Bromofluorobenzene (S)	%.						101	102	75-125			
Toluene-d8 (S)	%.						98	98	75-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

DL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: 913026

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

D4 Sample was diluted due to the presence of high levels of target analytes.

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(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10672730

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10672730001	**MW-1 / T40**	EPA 8260D	912707		
10672730001	**MW-1 / T40**	EPA 8260D	913026		
10672730002	**TS-1 / T40**	EPA 8260D	912707		
10672730003	**MW-5 / T40**	EPA 8260D	913026		
10672730004	**MW-6 / T40**	EPA 8260D	912707		
10672730005	**MW-7 / T40**	EPA 8260D	913026		
10672730006	**MW-2 / T40**	EPA 8260D	913138		
10672730007	**MW-4 / T40**	EPA 8260D	913138		
10672730008	**Trip Blank**	EPA 8260D	912707		

WO#: 10672730

10672730

Barr Engineering Co. Chain of Custody

Sample Origination State

☐ CO ☐ MI ☐ MN ☐ MO ☐ ND ☐ NV ☐ TX ☐ UT ☑ WI ☐ V

COC Number: № 595779

COC 1 of 1

REPORT TO	INVOICE TO
Company: Barr Engineering Co	Company:
Address: 325 South Lake Ave	Address:
Address: Duluth, MN 55802	Address:
Name: Lynette Carney	Name:
email: LCarney@barr.com	email:
Copy to: BarrDM@barr.com	P.O.
Project Name: SRC GW TK 40	Barr Project No: 49161494.02 100 102

Location	Sample Depth Start	Stop	Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix Code	Perform MS/MSD Y / N	Total Number Of Containers	PVOCs (EPA 8260)	% Solids
1. MW-1 / T40				10/16/2023	08:20	GW	N	3	X	
2. TS-1 / T40					08:33	GW	N	3	X	
3. MW-5 / T40					08:41	GW	N	3	X	
4. MW-6 / T40					08:50	GW	N	3	X	
5. MW-7 / T40					08:56	GW	N	3	X	
6. MW-2 / T40					09:06	GW	N	3	X	
7. MW-4 / T40					09:19	GW	N	3	X	
8. Trip Blank						WQ	N	2	X	
9.										
10.										
B										
Z										

Preservative Code

Field Filtered Y/N

001	
002	
003	
004	
005	
006	
007	
008	

Matrix Code: GW = Groundwater; SW = Surface Water; DW = Drinking Water; PW = Pore Water; WW = Waste Water; WQ = TB, FB, EB, etc.; W = Unspecified; S = Soil/Solid; SD = Sediment; SQ = MeOH blank; OTH = Other (Oil, etc.)

Preservative Code: A = None; B = HCl; C = HNO_3; D = H_2SO_4; E = NaOH; F = MeOH; G = $NaHSO_4$; H = $Na_2S_2O_3$; I = Ascorbic Acid; J = Zn Acetate; K = Other

BARR USE ONLY

Sampled by: KLS3

Barr Proj. Manager: LMC

Barr DQ Manager: JET

Lab Name: Pace Analytical

Lab Location: Minneapolis, MN

Relinquished by:	On Ice?	Date	Time	Received by:	Date	Time
Kinsey	(Y) N	10/16/2023	16:08	David Riggs / Pace	10/16/23	16:08
Relinquished by: David Riggs / Pace	On Ice? (Y) N	Date 10/16/23	Time 16:15	Received by: David Pace	Date 10/17/23	Time 0805 3.8

Samples Shipped VIA: ☐ Ground Courier ☐ Air Carrier ☐ Sampler ☐ Other: _____

Air Bill Number:

Lab WO:

Temperature on Receipt (°C): 6.2

Custody Seal Intact? ☐ Y ☐ N ☐ None

Requested Due Date: TA

☑ Standard Turn Around Time

☐ Rush _____ (mm/dd/yyyy)

Rel: 10/17/23 1405 Rec: 10/17/23 0805

Distribution - **White-Original:** Accompanies Shipment to Laboratory; **Yellow Copy:** Include in Field Documents; **Scan and email:** a copy to BarrDM@barr.com for tracking and filing procedures

H:\RLG\STDFORMS\Chain of Custody Form 2022 RLG Rev. 10/14/2021

Sample Condition Upon Receipt

Client Name: Barr Engineering Co

Project #: **WO#: 10672730**

PM: MKH **Due Date: 10/31/23**

CLIENT: BARR

Courier: ☐ FedEx ☐ UPS ☐ USPS ☑ Client ☐ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: _____ ☐ See Exceptions ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☑ Yes ☐ No **Seals Intact?** ☐ Yes ☑ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Packing Material: ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other **Temp Blank?** ☑ Yes ☐ No

Thermometer: ☐ T1 (0461) ☐ T2 (0436) ☐ T3 (0459) ☑ T4 (0402) ☐ T5 (0178) ☐ T6 (0235) ☐ T7 (0042) ☐ T8 (0775) ☐ T9(0727) ☐ 01339252/1710 **Type of Ice:** ☑ Wet ☐ Blue ☐ Dry ☐ None ☐ Melted

Did Samples Originate in West Virginia? ☐ Yes ☑ No **Were All Container Temps Taken?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6 °C **Cooler temp Read w/Temp Blank:** 3.7 °C

Correction Factor: +0.1 **Cooler Temp Corrected w/temp blank:** 3.8 °C

Average Corrected Temp (no temp blank only): _____ °C ☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

USDA Regulated Soil: (☑ N/A, water sample/other: _____)

Date/Initials of Person Examining Contents: DGS 10/18/23

Did samples originate in a quarantine zone within the United States: AL, AR, AZ CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (ENV-FRM-MIN4-0154) and include with SCUR/COC paperwork.

Location (Check one): ☐ Duluth ☑ Minneapolis ☐ Virginia

				COMMENTS
Chain of Custody Present and Filled Out?	☑ Yes	☐ No		1.
Chain of Custody Relinquished?	☑ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☑ Yes	☐ No		4. If fecal: ☐ <8 hrs ☐ >8 hr, <24 ☐ No
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E.coli ☐ BOD/cBOD ☐ Hex Chrom ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other _____
Rush Turn Around Time Requested?	☐ Yes	☑ No		6.
Sufficient Sample Volume?	☑ Yes	☐ No		7.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	8.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☑ Water ☐ Soil ☐ Oil ☐ Other	☑ Yes	☐ No		11. **If no, write ID/Date/Time of container below:** ☐ See Exceptions ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☑ N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO3, H2SO4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐ Yes	☐ No	☑ N/A	☐ NaOH ☐ HNO3 ☐ H2SO4 ☐ Zinc Acetate
Exceptions: VOA Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxins/PFAS (*If adding preservative to a container, it must be added to associated field and equipment blanks--verify with PM first.)	☑ Yes	☐ No	☐ N/A	Positive for Residual Chlorine? ☐ Yes ☐ No ☐ See Exceptions ENV-FRM-MIN4-0142 **pH Paper Lot #** Residual Chlorine / 0-6 Roll / 0-6 Strip / 0-14 Strip
Headspace in Methyl Mercury Container?	☐ Yes	☐ No	☑ N/A	13.
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☑ N/A	14. ☐ See Exceptions ENV-FRM-MIN4-0142
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☑ No	☐ N/A	
3 Trip Blanks Present?	☑ Yes	☐ No	☐ N/A	15.
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	Pace Trip Blank Lot # (if purchased): 438149 (2)

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: _____ **Date:** 10/18/23

NOTE: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e., out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled By: DGS **Line:** 2