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BARR

March 2, 2023

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

Re: 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

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 2022.

1 Facility and Site Background Information

Figure 1 shows the location of Tank 40 within the refinery, the approximate property boundary of the refinery, and the area surrounding the refinery. Figure 2 presents the site layout of Tank 40 which 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. The basin's ground surface 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 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), 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. In January 2021, Husky and Cenovus Energy Inc. (Cenovus) merged to become Cenovus, however the legal name of the refinery will remain unchanged.

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 released gasoline floated on top of the storm water within the diked area. A vacuum truck was used to recover storm water and residual product 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 completed including soil borings and the installation of 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 2022.

As described in previous reports, measurable product has been encountered in the monitoring wells associated with the Tank 40 basin on multiple occasions. Free product was initially encountered in the basin in July 2000. Since then, the monitoring network in the Tank 40 basin (monitoring wells MW-1/T40, MW-2/T40, and MW-4/T40 through MW-7/T40; monitoring points MP-1/T40 through MP-3/T40, and test pit sump TP-1/T40; and an interceptor trench with a sump TS-1/T40) have been routinely monitored for the presence of product (Figure 2). If present, product was removed and sent through the refinery's No. 1 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 MW-3/T40 was abandoned in July 2007 (GF, 2019).

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 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, product has been manually bailed when observed in a monitoring well. 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 No. 1 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 No. 1 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 2022

Year-round access to wells, monitoring points, and sumps at the refinery is not practical because of relatively shallow groundwater, cold weather, and snow. When conditions allow access, water and product levels are monitored monthly. If product is encountered, the product is removed and sent through the refinery's No. 1 API oil/water separator. Separated oil is stored for use at the refinery and the water is treated at the on-site WWTP.

Monitoring wells and recovery sump TS-1/T40 are gauged, purged, and sampled in spring and fall (typically April/May and September/October). Monitoring wells, monitoring points and sumps are routinely checked for the presence of product and, if encountered, the product is removed from the well, point, or sump by bailing.

Since the most recent remediation progress report was submitted to the WDNR on January 6, 2022 (Barr, 2022), work at Tank 40 has included the gauging of water and product levels in associated site monitoring wells, monitoring points, test pit sump, and recovery trench sump and the collection of groundwater samples from select locations. Monitoring well gauging activities conducted in 2022 are summarized in Table 1.

3.1 Product Recovery

During the reporting period, measurable product was not encountered in the monitoring wells, monitoring points, test pit sump, or recovery trench sump. Point MP-2/T40 was dry, and a gauging measurement could not be obtained during the July 22, 2022 free product check. 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, but for all practical purposes, free product likely has been recovered to the extent practical from the Tank 40 basin.

3.2 Groundwater Sampling and Results

Groundwater samples were collected by Barr and Insight Environmental (Insight) field staff at the site in spring (May and June) and fall (October) 2022. 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 samples. Groundwater in monitoring points MP-2/T40, MP-3/T40 and recover trench TP-1/T40 was frozen during the first purge event on April 27, 2022, and therefore no depth to groundwater measurement was collected at these locations. 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 25, 2022 and October 11, 2022. Field staff used a new one-time-use polyethylene disposable bailer with new nylon rope to collect each groundwater sample. The spring 2022 and fall 2022 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 2022 contained one or more PVOCs at concentrations equal to or greater than NR 140 ES.
- Historically, samples collected from the monitoring wells and recovery trench sump contained one or more PVOC compounds at a concentration at or above its applicable NR 140 ES.
- Because of the removal of accumulated free product over the years, PVOC concentrations in the wells have been stable or decreasing. Figure 3 presents trend analysis plots for benzene concentrations in groundwater samples from MW-1/T40, MW-4/T40, MW-5/T40, MW-6/T40, and MW-7/T40. Note that the plotted data for each well only includes the time period since: a) free product was most recently removed; and b) samples were collected at least once per year. The best-fit exponential trend lines were generated using a scatter plot chart. As shown on Figure 3, dissolved-phase benzene concentrations in the 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 2022.

Historically, a groundwater contour map for the Tank 40 release site has not been prepared because groundwater levels in the wells either are 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).

3.3 Monitoring Well Maintenance Activities

In 2022 the well screen at monitoring point MP-3/T40 was found to be exposed above ground due to suspected frost heave activity. As this presents a conduit to groundwater the monitoring point was sealed on September 1, 2022. This monitoring point was not part of the current monitoring well network for Tank 40 and therefore will not be replaced. The abandonment form is in Attachment B.

The PVC monitoring well at MW-4/T40 experienced multiple events of frost heave over the years resulting in the PVC casing/riser extending more than 3.5 feet above ground surface and making it difficult to access the top of the riser for gauging and sampling. On November 4, 2022, the monitoring well PVC casing/riser was cut down and the new top of riser elevation resurveyed.

Monitoring well MW-1/T40 experienced multiple events of frost heave over the years resulting in the PVC riser extending above the pro-top cover which would not allow the pro-top cover to be closed. The PVC riser was cut down 0.7 feet on December 8, 2022, to allow the pro-top cover to close.

4 Future Work

SRC's work plan for 2023 is as follows:

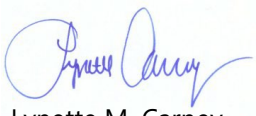
- Continue to check for, and if present, manually bail product monthly (as conditions allow) from the six monitoring wells (MW-1/T40, MW-2/T40, and MW-4/T40 through MW-7/T40), two monitoring points (MP-1/T40 and MP-2/T40), test pit sump (TP-1/T40) and recovery trench sump (TS-1/T40). If, however, product is not observed during the spring gauging event, as was the case in 2019- 2022, 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 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 (but not the recovery sump TS-1/T40) 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 2024. If product is not encountered in any of the wells in 2023, and decreasing trends in 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,

BARR ENGINEERING CO.



Lynette M. Carney
Project Manager

cc: Joseph Pearson (SRC)

Tables

Table 1	2022 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
Attachment B	Well Abandonment Form (MP-3/T40)

References

Barr Engineering Co., 2022. *2021 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.* January 6, 2022.

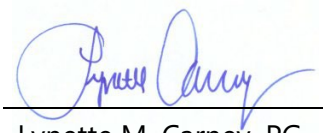
Gannett Fleming, Inc. (GF), 2014. *Final Memorandum of Agreement, Site Investigation and Remedial Action Plan, Superior Refinery, Superior, Wisconsin, WDNR BRRTS# 02-16-559511*. April 2014.

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.

Wisconsin Department of Natural Resources, 2020. *Reminder to Include Evaluation of Emerging Contaminants in Site Investigation, Murphy Oil – Tank #40, 2407 Stinson Ave, BRRTS# 02-16-222712*. Letter to Husky Energy dated August 17, 2020.

CERTIFICATIONS

"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."



March 2, 2023

Lynette M. Carney, PG
Reg #: 1138

Tables

Table 1
2022 Fluid Level Monitoring Data
Tank 40 Release Site (1)
Superior Refining Company LLC
Superior, Wisconsin

Date	MP-1/T40		MP-2/T40		MP-3/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	DTP	DTW	
	Depth to Fluid from Top of Casing (feet)																						
04/27/22	--	4.95	--[5]	--[5]	--[5]	--[5]	--	4.12	--	4.10	--	4.83	--	3.45	--	3.70	--	3.49	--[5]	--[5]	--	3.50	(2)
05/11/22	--	4.91	--	5.93	--	7.22	--	4.08	--	3.31	--	4.79	--	3.5	--	3.66	--	3.65	--	5.01	--	3.53	(2)
05/25/22	--	5.34	--	6.07	--	7.02	--	4.39	--	2.88	--	4.80	--	4.78	--	3.93	--	3.80	--	4.95	--	3.58	(3)
07/22/22	--	5.90	--	--[6]	--	7.85	--	4.80	--	3.10	--	6.00	--	4.20	--	4.70	--	4.50	--	5.65	--	4.80	(4)
09/13/22	--	5.11	--	5.15	nm[7]	nm[7]	--	4.20	--	3.60	--	4.62	--	3.55	--	3.82	--	6.67	--	4.82	--	3.70	(2)
09/28/22	--	5.04	--	6.14	nm[7]	nm[7]	--	4.32	--	6.76	--	5.02	--	3.64	--	3.87	--	3.72	--	5.21	--	3.79	(2)
10/11/22	--	5.53	--	6.36	nm[7]	nm[7]	--	4.47	--	7.60	--	5.14	--	3.90	--	4.13	--	3.73	--	5.30	--	5.40	(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.
(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) Water was frozen in well.
(6) No water was present to measure.
(7) Well was sealed.

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

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
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

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

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

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

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
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.								
10/6/2020	Recovery sump not sampled.								
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

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

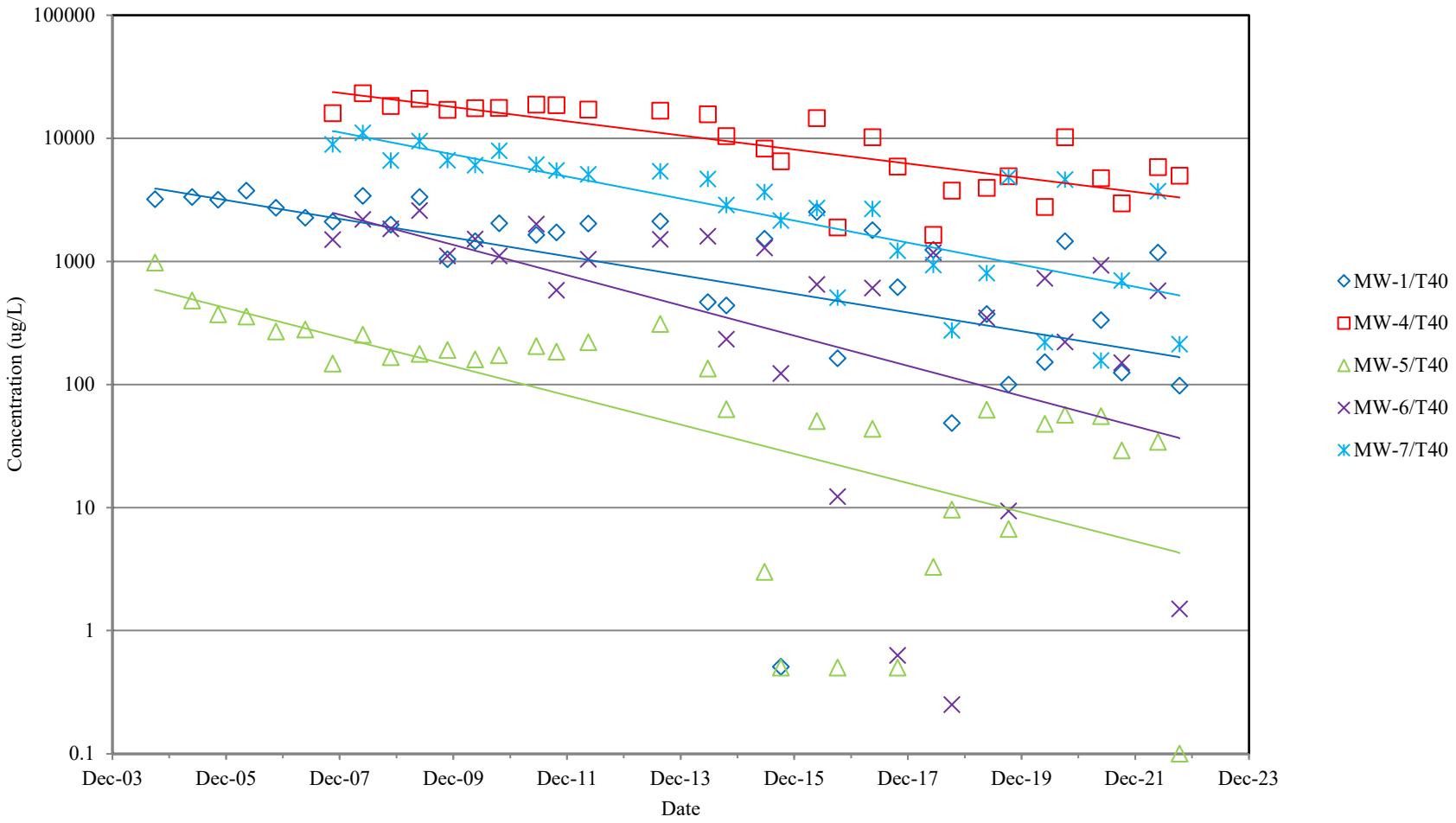
TANK 40 SITE LAYOUT & MONITORING LOCATIONS
Superior Refining Company LLC (SRC)
Superior, WI

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

Attachments

Attachment A

Pace Analytical Laboratory Reports

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

October 24, 2022

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

RE: Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10629450

Dear Jim Taraldsen:

Enclosed are the analytical results for sample(s) received by the laboratory on October 12, 2022. 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.: 10629450

Pace Analytical Services, LLC - Minneapolis MN

1700 Elm Street SE, Minneapolis, MN 55414
A2LA Certification #: 2926.01*
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
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
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
Ohio VAP Certification (1800) #: CL110*
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
*Please Note: Applicable air certifications are denoted with an asterisk (*).

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.: 10629450

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10629450001	**MW-1 / T40**	Water	10/11/22 11:42	10/12/22 08:00
10629450002	**MW-2 / T40**	Water	10/11/22 11:35	10/12/22 08:00
10629450003	**MW-4 / T40**	Water	10/11/22 12:05	10/12/22 08:00
10629450004	**MW-5 / T40**	Water	10/11/22 11:27	10/12/22 08:00
10629450005	**MW-6 / T40**	Water	10/11/22 11:48	10/12/22 08:00
10629450006	**MW-7 / T40**	Water	10/11/22 11:57	10/12/22 08:00
10629450007	**TS-1 / T40**	Water	10/11/22 11:20	10/12/22 08:00
10629450008	**Trip Blank**	Water	10/11/22 00:00	10/12/22 08:00

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

SAMPLE ANALYTE COUNT

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10629450

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10629450001	**MW-1 / T40**	EPA 8260D	NMB	10	PASI-M
10629450002	**MW-2 / T40**	EPA 8260D	NMB	10	PASI-M
10629450003	**MW-4 / T40**	EPA 8260D	TKL	10	PASI-M
10629450004	**MW-5 / T40**	EPA 8260D	TKL	10	PASI-M
10629450005	**MW-6 / T40**	EPA 8260D	TKL	10	PASI-M
10629450006	**MW-7 / T40**	EPA 8260D	PAB	10	PASI-M
10629450007	**TS-1 / T40**	EPA 8260D	TKL	10	PASI-M
10629450008	**Trip Blank**	EPA 8260D	TKL	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: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10629450

Sample: MW-1 / T40 **Lab ID: 10629450001** Collected: 10/11/22 11:42 Received: 10/12/22 08:00 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	**97.7**	ug/L	1.0	0.10	1		10/18/22 20:58	71-43-2	
Ethylbenzene	**3.7**	ug/L	1.0	0.11	1		10/18/22 20:58	100-41-4	
Methyl-tert-butyl ether	**<0.13**	ug/L	1.0	0.13	1		10/18/22 20:58	1634-04-4	
Toluene	**0.57J**	ug/L	1.0	0.10	1		10/18/22 20:58	108-88-3	
1,2,4-Trimethylbenzene	**216**	ug/L	2.0	0.26	2		10/14/22 23:20	95-63-6	
1,3,5-Trimethylbenzene	**122**	ug/L	1.0	0.11	1		10/18/22 20:58	108-67-8	
Xylene (Total)	**598**	ug/L	6.0	0.40	2		10/14/22 23:20	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	101	%.	75-125		1		10/18/22 20:58	2199-69-1	
4-Bromofluorobenzene (S)	102	%.	75-125		1		10/18/22 20:58	460-00-4	
Toluene-d8 (S)	104	%.	75-125		1		10/18/22 20:58	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10629450

Sample: MW-2 / T40 **Lab ID: 10629450002** Collected: 10/11/22 11:35 Received: 10/12/22 08:00 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	**9860**	ug/L	100	10.3	100		10/18/22 22:00	71-43-2	
Ethylbenzene	**1610**	ug/L	100	10.9	100		10/18/22 22:00	100-41-4	
Methyl-tert-butyl ether	**<0.13**	ug/L	1.0	0.13	1		10/14/22 23:05	1634-04-4	
Toluene	**6.1**	ug/L	1.0	0.10	1		10/14/22 23:05	108-88-3	
1,2,4-Trimethylbenzene	**1240**	ug/L	100	13.0	100		10/18/22 22:00	95-63-6	
1,3,5-Trimethylbenzene	**326**	ug/L	100	11.3	100		10/18/22 22:00	108-67-8	
Xylene (Total)	**8870**	ug/L	300	19.9	100		10/18/22 22:00	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	99	%.	75-125		1		10/14/22 23:05	2199-69-1	
4-Bromofluorobenzene (S)	118	%.	75-125		1		10/14/22 23:05	460-00-4	
Toluene-d8 (S)	106	%.	75-125		1		10/14/22 23:05	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10629450

Sample: MW-4 / T40 **Lab ID: 10629450003** Collected: 10/11/22 12:05 Received: 10/12/22 08:00 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	**4980**	ug/L	50.0	5.2	50		10/17/22 18:40	71-43-2	
Ethylbenzene	**164**	ug/L	50.0	5.4	50		10/17/22 18:40	100-41-4	
Methyl-tert-butyl ether	**<6.3**	ug/L	50.0	6.3	50		10/17/22 18:40	1634-04-4	
Toluene	**<5.2**	ug/L	50.0	5.2	50		10/17/22 18:40	108-88-3	
1,2,4-Trimethylbenzene	**1260**	ug/L	50.0	6.5	50		10/17/22 18:40	95-63-6	
1,3,5-Trimethylbenzene	**312**	ug/L	50.0	5.6	50		10/17/22 18:40	108-67-8	
Xylene (Total)	**3730**	ug/L	150	10	50		10/17/22 18:40	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	99	%.	75-125		50		10/17/22 18:40	2199-69-1	D4
4-Bromofluorobenzene (S)	103	%.	75-125		50		10/17/22 18:40	460-00-4	
Toluene-d8 (S)	98	%.	75-125		50		10/17/22 18:40	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10629450

Sample: MW-5 / T40 **Lab ID: 10629450004** Collected: 10/11/22 11:27 Received: 10/12/22 08:00 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		10/17/22 16:36	71-43-2	
Ethylbenzene	**<0.11**	ug/L	1.0	0.11	1		10/17/22 16:36	100-41-4	
Methyl-tert-butyl ether	**<0.13**	ug/L	1.0	0.13	1		10/17/22 16:36	1634-04-4	
Toluene	**<0.10**	ug/L	1.0	0.10	1		10/17/22 16:36	108-88-3	
1,2,4-Trimethylbenzene	**<0.13**	ug/L	1.0	0.13	1		10/17/22 16:36	95-63-6	
1,3,5-Trimethylbenzene	**<0.11**	ug/L	1.0	0.11	1		10/17/22 16:36	108-67-8	
Xylene (Total)	**<0.20**	ug/L	3.0	0.20	1		10/17/22 16:36	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	99	%.	75-125		1		10/17/22 16:36	2199-69-1	
4-Bromofluorobenzene (S)	99	%.	75-125		1		10/17/22 16:36	460-00-4	
Toluene-d8 (S)	101	%.	75-125		1		10/17/22 16:36	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10629450

Sample: MW-6 / T40 **Lab ID: 10629450005** Collected: 10/11/22 11:48 Received: 10/12/22 08:00 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	**1.5**	ug/L	1.0	0.10	1		10/17/22 16:52	71-43-2	
Ethylbenzene	**0.20J**	ug/L	1.0	0.11	1		10/17/22 16:52	100-41-4	
Methyl-tert-butyl ether	**<0.13**	ug/L	1.0	0.13	1		10/17/22 16:52	1634-04-4	
Toluene	**<0.10**	ug/L	1.0	0.10	1		10/17/22 16:52	108-88-3	
1,2,4-Trimethylbenzene	**1.0**	ug/L	1.0	0.13	1		10/17/22 16:52	95-63-6	
1,3,5-Trimethylbenzene	**<0.11**	ug/L	1.0	0.11	1		10/17/22 16:52	108-67-8	
Xylene (Total)	**0.32J**	ug/L	3.0	0.20	1		10/17/22 16:52	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	98	%.	75-125		1		10/17/22 16:52	2199-69-1	
4-Bromofluorobenzene (S)	101	%.	75-125		1		10/17/22 16:52	460-00-4	
Toluene-d8 (S)	100	%.	75-125		1		10/17/22 16:52	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10629450

Sample: MW-7 / T40 **Lab ID: 10629450006** Collected: 10/11/22 11:57 Received: 10/12/22 08:00 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	**213**	ug/L	2.0	0.21	2		10/19/22 01:18	71-43-2	
Ethylbenzene	**61.5**	ug/L	2.0	0.22	2		10/19/22 01:18	100-41-4	
Methyl-tert-butyl ether	**<0.25**	ug/L	2.0	0.25	2		10/19/22 01:18	1634-04-4	
Toluene	**0.68J**	ug/L	2.0	0.21	2		10/19/22 01:18	108-88-3	
1,2,4-Trimethylbenzene	**86.7**	ug/L	2.0	0.26	2		10/19/22 01:18	95-63-6	
1,3,5-Trimethylbenzene	**18.0**	ug/L	2.0	0.23	2		10/19/22 01:18	108-67-8	
Xylene (Total)	**165**	ug/L	6.0	0.40	2		10/19/22 01:18	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	99	%.	75-125		2		10/19/22 01:18	2199-69-1	D4
4-Bromofluorobenzene (S)	100	%.	75-125		2		10/19/22 01:18	460-00-4	
Toluene-d8 (S)	99	%.	75-125		2		10/19/22 01:18	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10629450

Sample: TS-1 / T40 **Lab ID: 10629450007** Collected: 10/11/22 11:20 Received: 10/12/22 08:00 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	**0.19J**	ug/L	1.0	0.10	1		10/17/22 17:07	71-43-2	
Ethylbenzene	**0.12J**	ug/L	1.0	0.11	1		10/17/22 17:07	100-41-4	
Methyl-tert-butyl ether	**<0.13**	ug/L	1.0	0.13	1		10/17/22 17:07	1634-04-4	
Toluene	**<0.10**	ug/L	1.0	0.10	1		10/17/22 17:07	108-88-3	
1,2,4-Trimethylbenzene	**0.14J**	ug/L	1.0	0.13	1		10/17/22 17:07	95-63-6	
1,3,5-Trimethylbenzene	**<0.11**	ug/L	1.0	0.11	1		10/17/22 17:07	108-67-8	
Xylene (Total)	**<0.20**	ug/L	3.0	0.20	1		10/17/22 17:07	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	98	%.	75-125		1		10/17/22 17:07	2199-69-1	
4-Bromofluorobenzene (S)	101	%.	75-125		1		10/17/22 17:07	460-00-4	
Toluene-d8 (S)	101	%.	75-125		1		10/17/22 17:07	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10629450

Sample: Trip Blank **Lab ID: 10629450008** Collected: 10/11/22 00:00 Received: 10/12/22 08:00 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		10/17/22 14:16	71-43-2	
Ethylbenzene	**<0.11**	ug/L	1.0	0.11	1		10/17/22 14:16	100-41-4	
Methyl-tert-butyl ether	**<0.13**	ug/L	1.0	0.13	1		10/17/22 14:16	1634-04-4	
Toluene	**<0.10**	ug/L	1.0	0.10	1		10/17/22 14:16	108-88-3	
1,2,4-Trimethylbenzene	**<0.13**	ug/L	1.0	0.13	1		10/17/22 14:16	95-63-6	
1,3,5-Trimethylbenzene	**<0.11**	ug/L	1.0	0.11	1		10/17/22 14:16	108-67-8	
Xylene (Total)	**<0.20**	ug/L	3.0	0.20	1		10/17/22 14:16	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	99	%.	75-125		1		10/17/22 14:16	2199-69-1	
4-Bromofluorobenzene (S)	103	%.	75-125		1		10/17/22 14:16	460-00-4	
Toluene-d8 (S)	100	%.	75-125		1		10/17/22 14:16	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10629450

QC Batch: 847015
QC Batch Method: EPA 8260D
Analysis Method: EPA 8260D
Analysis Description: 8260D MSV UST-WATER
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10629450001, 10629450002

METHOD BLANK: 4481767 Matrix: Water
Associated Lab Samples: 10629450001, 10629450002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	<0.13	1.0	10/14/22 21:01	
Methyl-tert-butyl ether	ug/L	<0.13	1.0	10/14/22 21:01	
Toluene	ug/L	<0.10	1.0	10/14/22 21:01	
Xylene (Total)	ug/L	<0.20	3.0	10/14/22 21:01	
1,2-Dichlorobenzene-d4 (S)	%.	97	75-125	10/14/22 21:01	
4-Bromofluorobenzene (S)	%.	98	75-125	10/14/22 21:01	
Toluene-d8 (S)	%.	102	75-125	10/14/22 21:01	

LABORATORY CONTROL SAMPLE: 4481768

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	19.8	99	75-125	
Methyl-tert-butyl ether	ug/L	20	19.2	96	75-125	
Toluene	ug/L	20	19.4	97	74-125	
Xylene (Total)	ug/L	60	60.4	101	72-125	
1,2-Dichlorobenzene-d4 (S)	%.			96	75-125	
4-Bromofluorobenzene (S)	%.			101	75-125	
Toluene-d8 (S)	%.			100	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4481771 4481772

Parameter	Units	10629373002 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	1980	500	500	2530	2490	110	102	62-138	2	30	
Methyl-tert-butyl ether	ug/L	ND	500	500	514	518	103	104	65-137	1	30	
Toluene	ug/L	1620	500	500	2150	2110	105	97	69-131	2	30	
Xylene (Total)	ug/L	9230	1500	1500	10600	10400	93	80	68-136	2	30	
1,2-Dichlorobenzene-d4 (S)	%.						97	97	75-125			D4
4-Bromofluorobenzene (S)	%.						104	105	75-125			
Toluene-d8 (S)	%.						101	102	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: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10629450

QC Batch: 847322
QC Batch Method: EPA 8260D
Analysis Method: EPA 8260D
Analysis Description: 8260D MSV UST-WATER
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10629450003, 10629450004, 10629450005, 10629450007, 10629450008

METHOD BLANK: 4483172 Matrix: Water
Associated Lab Samples: 10629450003, 10629450004, 10629450005, 10629450007, 10629450008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	<0.13	1.0	10/17/22 11:35	
1,3,5-Trimethylbenzene	ug/L	<0.11	1.0	10/17/22 11:35	
Benzene	ug/L	<0.10	1.0	10/17/22 11:35	
Ethylbenzene	ug/L	<0.11	1.0	10/17/22 11:35	
Methyl-tert-butyl ether	ug/L	<0.13	1.0	10/17/22 11:35	
Toluene	ug/L	<0.10	1.0	10/17/22 11:35	
Xylene (Total)	ug/L	<0.20	3.0	10/17/22 11:35	
1,2-Dichlorobenzene-d4 (S)	%.	99	75-125	10/17/22 11:35	
4-Bromofluorobenzene (S)	%.	99	75-125	10/17/22 11:35	
Toluene-d8 (S)	%.	100	75-125	10/17/22 11:35	

LABORATORY CONTROL SAMPLE: 4483173

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	19.2	96	75-125	
1,3,5-Trimethylbenzene	ug/L	20	18.7	93	75-125	
Benzene	ug/L	20	17.3	86	73-125	
Ethylbenzene	ug/L	20	18.3	92	75-125	
Methyl-tert-butyl ether	ug/L	20	17.9	89	75-125	
Toluene	ug/L	20	17.4	87	74-125	
Xylene (Total)	ug/L	60	54.8	91	72-125	
1,2-Dichlorobenzene-d4 (S)	%.			98	75-125	
4-Bromofluorobenzene (S)	%.			103	75-125	
Toluene-d8 (S)	%.			101	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4483180 4483181

Parameter	Units	10628432008 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	1520	2000	2000	4050	4180	127	133	62-138	3	30	
1,3,5-Trimethylbenzene	ug/L	119	2000	2000	2450	2540	117	121	64-135	3	30	
Benzene	ug/L	8960	2000	2000	10900	11300	95	116	65-140	4	30	
Ethylbenzene	ug/L	1450	2000	2000	3810	3940	118	125	66-126	4	30	
Methyl-tert-butyl ether	ug/L	ND	2000	2000	2260	2270	113	113	65-137	0	30	
Toluene	ug/L	ND	2000	2000	2210	2310	107	113	69-131	5	30	
Xylene (Total)	ug/L	807			7800	7950				2	30	
1,2-Dichlorobenzene-d4 (S)	%.						97	98	75-125			

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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.: 10629450

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4483180 4483181

Parameter	Units	10628432008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
4-Bromofluorobenzene (S)	%.						105	103	75-125			
Toluene-d8 (S)	%.						101	100	75-125			

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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.: 10629450

QC Batch: 847655
QC Batch Method: EPA 8260D
Analysis Method: EPA 8260D
Analysis Description: 8260D MSV UST-WATER
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10629450001, 10629450002

METHOD BLANK: 4484516 Matrix: Water
Associated Lab Samples: 10629450001, 10629450002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	<0.13	1.0	10/18/22 20:43	
1,3,5-Trimethylbenzene	ug/L	<0.11	1.0	10/18/22 20:43	
Benzene	ug/L	<0.10	1.0	10/18/22 20:43	
Ethylbenzene	ug/L	<0.11	1.0	10/18/22 20:43	
Methyl-tert-butyl ether	ug/L	<0.13	1.0	10/18/22 20:43	
Toluene	ug/L	<0.10	1.0	10/18/22 20:43	
Xylene (Total)	ug/L	<0.20	3.0	10/18/22 20:43	
1,2-Dichlorobenzene-d4 (S)	%.	100	75-125	10/18/22 20:43	
4-Bromofluorobenzene (S)	%.	99	75-125	10/18/22 20:43	
Toluene-d8 (S)	%.	102	75-125	10/18/22 20:43	

LABORATORY CONTROL SAMPLE: 4484517

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	22.9	115	75-125	
1,3,5-Trimethylbenzene	ug/L	20	22.4	112	75-125	
Benzene	ug/L	20	21.8	109	73-125	
Ethylbenzene	ug/L	20	22.1	110	75-125	
Methyl-tert-butyl ether	ug/L	20	22.0	110	75-125	
Toluene	ug/L	20	22.2	111	74-125	
Xylene (Total)	ug/L	60	66.1	110	72-125	
1,2-Dichlorobenzene-d4 (S)	%.			97	75-125	
4-Bromofluorobenzene (S)	%.			101	75-125	
Toluene-d8 (S)	%.			101	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4484549 4484550

Parameter	Units	10629399003 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	186	400	400	605	619	105	108	62-138	2	30	
1,3,5-Trimethylbenzene	ug/L	76.6	400	400	487	496	103	105	64-135	2	30	
Benzene	ug/L	2750	400	400	3100	3140	86	97	65-140	1	30	
Ethylbenzene	ug/L	116	400	400	515	524	100	102	66-126	2	30	
Methyl-tert-butyl ether	ug/L	<2.5	400	400	400	398	100	99	65-137	1	30	
Toluene	ug/L	33.9	400	400	425	432	98	100	69-131	2	30	
Xylene (Total)	ug/L	527	1200	1200	1730	1760	100	103	68-136	2	30	
1,2-Dichlorobenzene-d4 (S)	%.						98	97	75-125			D4

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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.: 10629450

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4484549 4484550

Parameter	Units	10629399003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
4-Bromofluorobenzene (S)	%.						100	103	75-125			
Toluene-d8 (S)	%.						100	99	75-125			

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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.: 10629450

QC Batch: 847662
QC Batch Method: EPA 8260D
Analysis Method: EPA 8260D
Analysis Description: 8260D MSV UST-WATER
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10629450006

METHOD BLANK: 4484588 Matrix: Water
Associated Lab Samples: 10629450006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	<0.13	1.0	10/19/22 00:16	
1,3,5-Trimethylbenzene	ug/L	<0.11	1.0	10/19/22 00:16	
Benzene	ug/L	<0.10	1.0	10/19/22 00:16	
Ethylbenzene	ug/L	<0.11	1.0	10/19/22 00:16	
Methyl-tert-butyl ether	ug/L	<0.13	1.0	10/19/22 00:16	
Toluene	ug/L	<0.10	1.0	10/19/22 00:16	
Xylene (Total)	ug/L	<0.20	3.0	10/19/22 00:16	
1,2-Dichlorobenzene-d4 (S)	%.	99	75-125	10/19/22 00:16	
4-Bromofluorobenzene (S)	%.	100	75-125	10/19/22 00:16	
Toluene-d8 (S)	%.	99	75-125	10/19/22 00:16	

LABORATORY CONTROL SAMPLE: 4484589

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	20.7	104	75-125	
1,3,5-Trimethylbenzene	ug/L	20	21.1	105	75-125	
Benzene	ug/L	20	19.2	96	73-125	
Ethylbenzene	ug/L	20	20.3	102	75-125	
Methyl-tert-butyl ether	ug/L	20	19.5	98	75-125	
Toluene	ug/L	20	18.7	93	74-125	
Xylene (Total)	ug/L	60	61.4	102	72-125	
1,2-Dichlorobenzene-d4 (S)	%.			100	75-125	
4-Bromofluorobenzene (S)	%.			102	75-125	
Toluene-d8 (S)	%.			100	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4484638 4484639

Parameter	Units	10629980003 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	23.1	100	100	124	126	101	103	62-138	1	30	
1,3,5-Trimethylbenzene	ug/L	7.8	100	100	108	111	100	103	64-135	3	30	
Benzene	ug/L	415	100	100	496	492	81	77	65-140	1	30	
Ethylbenzene	ug/L	31.5	100	100	132	131	100	100	66-126	0	30	
Methyl-tert-butyl ether	ug/L	<0.63	100	100	98.0	96.4	98	96	65-137	2	30	
Toluene	ug/L	9.0	100	100	104	104	95	95	69-131	0	30	
Xylene (Total)	ug/L	39.0	300	300	344	340	102	100	68-136	1	30	
1,2-Dichlorobenzene-d4 (S)	%.						97	97	75-125			

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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.: 10629450

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4484638 4484639

Parameter	Units	10629980003 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	101	75-125			
Toluene-d8 (S)	%.						100	100	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.: 10629450

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.

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.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 49161494.02 100 102 SRC GWTK40
Pace Project No.: 10629450

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10629450001	**MW-1 / T40**	EPA 8260D	847015		
10629450001	**MW-1 / T40**	EPA 8260D	847655		
10629450002	**MW-2 / T40**	EPA 8260D	847015		
10629450002	**MW-2 / T40**	EPA 8260D	847655		
10629450003	**MW-4 / T40**	EPA 8260D	847322		
10629450004	**MW-5 / T40**	EPA 8260D	847322		
10629450005	**MW-6 / T40**	EPA 8260D	847322		
10629450006	**MW-7 / T40**	EPA 8260D	847662		
10629450007	**TS-1 / T40**	EPA 8260D	847322		
10629450008	**Trip Blank**	EPA 8260D	847322		

Barr Engineering Co. Chain of Custody

WO#: 10629450

10629450

COC Number: № 591386

COC 1 of 1

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

REPORT TO		INVOICE TO	
Company:	Barr Engineering Co	Company:	Barr
Address:	325 S. 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 TK40	Barr Project No:	49161494.02 100 102

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

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	VOCs (EPA 8260) (Preservative Code: B; Field Filtered: N)	% Solids	
1. mw-1 /T40	—	—	—	10/11/2022	1142	GW	N	3	X		001
2. mw-2 /T40	—	—	—	↓	1135	GW	N	3	X		002
3. mw-3 /T40	—	—	—		1205	GW	N	3	X		003
4. mw-5 /T40	—	—	—		1127	GW	N	3	X		004
5. mw-6 /T40	—	—	—		1148	GW	N	3	X		005
6. mw-7 /T40	—	—	—		1157	GW	N	3	X		006
7. TS-1 /T40	—	—	—		1120	GW	N	3	X		007
8. Trip Blank	—	—	—	↓	—	WQ	N	2	X		008
9.											
10.											

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

Relinquished by:	On Ice?	Date	Time	Received by:	Date	Time
Kirra Schneider	Y	10/11/22	1541	[signature] Pace	10/11/22	1541
[signature] / Pace	Y	10/11/22	15:41	[signature]	10/12/22	0800

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

Air Bill Number: MKH 10/13/22

received in MPLS at 1.1 C

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

Lab WO:

Temperature on Receipt (°C): 6.0

Custody Seal Intact? ☐ Y ☐ N ☐ None

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

Project #: WO#: 10629450

PM: MKH Due Date: 10/26/22

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 (1336) ☐ T3 (0459) ☐ T4 (0254) ☐ T5 (0178) ☐ T6 (0235) ☐ T7 (0042) ☐ T8 (0775) ☐ 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:** 0.9 °C

Correction Factor: +0.2 **Cooler Temp Corrected w/temp blank:** 1.1 °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:** KB 10/12/22

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): 38612(2)

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

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: _____ **Date:** 10/13/22

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: KB **Line:** 1

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

June 08, 2022

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

RE: Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

Dear Jim Taraldsen:

Enclosed are the analytical results for sample(s) received by the laboratory on May 26, 2022. 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: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

Pace Analytical Services, LLC - Minneapolis MN

1700 Elm Street SE, Minneapolis, MN 55414
A2LA Certification #: 2926.01*
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
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
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
Ohio VAP Certification (1800) #: CL110*
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
*Please Note: Applicable air certifications are denoted with an asterisk (*).

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

SAMPLE SUMMARY

Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10610205001	**MW-1 / T40**	Water	05/25/22 11:15	05/26/22 15:03
10610205002	**MW-2 / T40**	Water	05/25/22 11:22	05/26/22 15:03
10610205003	**MW-4 / T40**	Water	05/25/22 11:27	05/26/22 15:03
10610205004	**MW-5 / T40**	Water	05/25/22 11:34	05/26/22 15:03
10610205005	**MW-6 / T40**	Water	05/25/22 11:40	05/26/22 15:03
10610205006	**MW-7 / T40**	Water	05/25/22 11:45	05/26/22 15:03
10610205007	**TS-1 / T40**	Water	05/25/22 11:52	05/26/22 15:03
10610205008	**Trip Blank**	Water	05/25/22 00:00	05/26/22 15:03

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10610205001	**MW-1 / T40**	EPA 8260D	NMB, TKL	10	PASI-M
10610205002	**MW-2 / T40**	EPA 8260D	NMB	10	PASI-M
10610205003	**MW-4 / T40**	EPA 8260D	NMB	10	PASI-M
10610205004	**MW-5 / T40**	EPA 8260D	NMB	10	PASI-M
10610205005	**MW-6 / T40**	EPA 8260D	NMB	10	PASI-M
10610205006	**MW-7 / T40**	EPA 8260D	NMB	10	PASI-M
10610205007	**TS-1 / T40**	EPA 8260D	NMB, TKL	10	PASI-M
10610205008	**Trip Blank**	EPA 8260D	NMB	10	PASI-M

PASI-M = Pace Analytical Services - Minneapolis

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

Sample: MW-1 / T40 **Lab ID: 10610205001** Collected: 05/25/22 11:15 Received: 05/26/22 15:03 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	**1180**	ug/L	20.0	2.1	20		06/07/22 03:50	71-43-2	
Ethylbenzene	**716**	ug/L	5.0	0.54	5		05/27/22 22:04	100-41-4	
Methyl-tert-butyl ether	**<0.63**	ug/L	5.0	0.63	5		05/27/22 22:04	1634-04-4	
Toluene	**<0.52**	ug/L	5.0	0.52	5		05/27/22 22:04	108-88-3	
1,2,4-Trimethylbenzene	**784**	ug/L	5.0	0.65	5		05/27/22 22:04	95-63-6	
1,3,5-Trimethylbenzene	**238**	ug/L	5.0	0.56	5		05/27/22 22:04	108-67-8	
Xylene (Total)	**3180**	ug/L	60.0	4.0	20		06/07/22 03:50	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	100	%.	75-125		5		05/27/22 22:04	2199-69-1	D4
4-Bromofluorobenzene (S)	95	%.	75-125		5		05/27/22 22:04	460-00-4	
Toluene-d8 (S)	96	%.	75-125		5		05/27/22 22:04	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

Sample: MW-2 / T40 **Lab ID: 10610205002** Collected: 05/25/22 11:22 Received: 05/26/22 15:03 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	**8300**	ug/L	50.0	5.2	50		06/01/22 20:16	71-43-2	
Ethylbenzene	**1570**	ug/L	50.0	5.4	50		06/01/22 20:16	100-41-4	
Methyl-tert-butyl ether	**13.0J**	ug/L	50.0	6.3	50		06/01/22 20:16	1634-04-4	
Toluene	**28.1J**	ug/L	50.0	5.2	50		06/01/22 20:16	108-88-3	
1,2,4-Trimethylbenzene	**1300**	ug/L	50.0	6.5	50		06/01/22 20:16	95-63-6	
1,3,5-Trimethylbenzene	**386**	ug/L	50.0	5.6	50		06/01/22 20:16	108-67-8	
Xylene (Total)	**7680**	ug/L	150	10	50		06/01/22 20:16	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	101	%.	75-125		50		06/01/22 20:16	2199-69-1	
4-Bromofluorobenzene (S)	102	%.	75-125		50		06/01/22 20:16	460-00-4	
Toluene-d8 (S)	102	%.	75-125		50		06/01/22 20:16	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(612)607-1700

ANALYTICAL RESULTS

Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

Sample: MW-4 / T40 **Lab ID: 10610205003** Collected: 05/25/22 11:27 Received: 05/26/22 15:03 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	**5840**	ug/L	100	10.3	100		06/01/22 21:18	71-43-2	
Ethylbenzene	**574**	ug/L	20.0	2.2	20		05/27/22 23:32	100-41-4	
Methyl-tert-butyl ether	**<2.5**	ug/L	20.0	2.5	20		05/27/22 23:32	1634-04-4	
Toluene	**<2.1**	ug/L	20.0	2.1	20		05/27/22 23:32	108-88-3	
1,2,4-Trimethylbenzene	**1000**	ug/L	20.0	2.6	20		05/27/22 23:32	95-63-6	
1,3,5-Trimethylbenzene	**255**	ug/L	20.0	2.3	20		05/27/22 23:32	108-67-8	
Xylene (Total)	**3090**	ug/L	60.0	4.0	20		05/27/22 23:32	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	103	%.	75-125		20		05/27/22 23:32	2199-69-1	D4
4-Bromofluorobenzene (S)	103	%.	75-125		20		05/27/22 23:32	460-00-4	
Toluene-d8 (S)	101	%.	75-125		20		05/27/22 23:32	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

Sample: MW-5 / T40 **Lab ID: 10610205004** Collected: 05/25/22 11:34 Received: 05/26/22 15:03 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	**34.2**	ug/L	1.0	0.10	1		05/27/22 22:15	71-43-2	
Ethylbenzene	**106**	ug/L	1.0	0.11	1		05/27/22 22:15	100-41-4	
Methyl-tert-butyl ether	**<0.13**	ug/L	1.0	0.13	1		05/27/22 22:15	1634-04-4	
Toluene	**<0.10**	ug/L	1.0	0.10	1		05/27/22 22:15	108-88-3	
1,2,4-Trimethylbenzene	**131**	ug/L	1.0	0.13	1		05/27/22 22:15	95-63-6	
1,3,5-Trimethylbenzene	**10.9**	ug/L	1.0	0.11	1		05/27/22 22:15	108-67-8	
Xylene (Total)	**115**	ug/L	3.0	0.20	1		05/27/22 22:15	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	100	%.	75-125		1		05/27/22 22:15	2199-69-1	
4-Bromofluorobenzene (S)	106	%.	75-125		1		05/27/22 22:15	460-00-4	
Toluene-d8 (S)	103	%.	75-125		1		05/27/22 22:15	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

Sample: MW-6 / T40 **Lab ID: 10610205005** Collected: 05/25/22 11:40 Received: 05/26/22 15:03 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	**576**	ug/L	10.0	1.0	10		06/01/22 18:58	71-43-2	
Ethylbenzene	**384**	ug/L	10.0	1.1	10		06/01/22 18:58	100-41-4	
Methyl-tert-butyl ether	**<0.13**	ug/L	1.0	0.13	1		05/27/22 22:30	1634-04-4	
Toluene	**<0.10**	ug/L	1.0	0.10	1		05/27/22 22:30	108-88-3	
1,2,4-Trimethylbenzene	**113**	ug/L	1.0	0.13	1		05/27/22 22:30	95-63-6	
1,3,5-Trimethylbenzene	**16.8**	ug/L	1.0	0.11	1		05/27/22 22:30	108-67-8	
Xylene (Total)	**264**	ug/L	3.0	0.20	1		05/27/22 22:30	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	102	%.	75-125		1		05/27/22 22:30	2199-69-1	
4-Bromofluorobenzene (S)	105	%.	75-125		1		05/27/22 22:30	460-00-4	
Toluene-d8 (S)	103	%.	75-125		1		05/27/22 22:30	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

Sample: MW-7 / T40 **Lab ID: 10610205006** Collected: 05/25/22 11:45 Received: 05/26/22 15:03 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	**3710**	ug/L	50.0	5.2	50		06/01/22 20:31	71-43-2	
Ethylbenzene	**1110**	ug/L	50.0	5.4	50		06/01/22 20:31	100-41-4	
Methyl-tert-butyl ether	**<0.63**	ug/L	5.0	0.63	5		05/27/22 23:17	1634-04-4	
Toluene	**1.1J**	ug/L	5.0	0.52	5		05/27/22 23:17	108-88-3	
1,2,4-Trimethylbenzene	**906**	ug/L	5.0	0.65	5		05/27/22 23:17	95-63-6	
1,3,5-Trimethylbenzene	**260**	ug/L	5.0	0.56	5		05/27/22 23:17	108-67-8	
Xylene (Total)	**3660**	ug/L	150	10	50		06/01/22 20:31	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	102	%.	75-125		5		05/27/22 23:17	2199-69-1	D4
4-Bromofluorobenzene (S)	105	%.	75-125		5		05/27/22 23:17	460-00-4	
Toluene-d8 (S)	102	%.	75-125		5		05/27/22 23:17	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

Sample: TS-1 / T40 **Lab ID: 10610205007** Collected: 05/25/22 11:52 Received: 05/26/22 15:03 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	**306**	ug/L	10.0	1.0	10		06/07/22 03:19	71-43-2	
Ethylbenzene	**207**	ug/L	10.0	1.1	10		06/07/22 03:19	100-41-4	
Methyl-tert-butyl ether	**<0.13**	ug/L	1.0	0.13	1		05/27/22 22:46	1634-04-4	
Toluene	**<0.10**	ug/L	1.0	0.10	1		05/27/22 22:46	108-88-3	
1,2,4-Trimethylbenzene	**133**	ug/L	1.0	0.13	1		05/27/22 22:46	95-63-6	
1,3,5-Trimethylbenzene	**<0.11**	ug/L	1.0	0.11	1		05/27/22 22:46	108-67-8	
Xylene (Total)	**0.56J**	ug/L	3.0	0.20	1		05/27/22 22:46	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	102	%.	75-125		1		05/27/22 22:46	2199-69-1	
4-Bromofluorobenzene (S)	104	%.	75-125		1		05/27/22 22:46	460-00-4	
Toluene-d8 (S)	104	%.	75-125		1		05/27/22 22:46	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

Sample: Trip Blank **Lab ID: 10610205008** Collected: 05/25/22 00:00 Received: 05/26/22 15:03 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		05/27/22 20:57	71-43-2	
Ethylbenzene	**<0.11**	ug/L	1.0	0.11	1		05/27/22 20:57	100-41-4	
Methyl-tert-butyl ether	**<0.13**	ug/L	1.0	0.13	1		05/27/22 20:57	1634-04-4	
Toluene	**<0.10**	ug/L	1.0	0.10	1		05/27/22 20:57	108-88-3	
1,2,4-Trimethylbenzene	**<0.13**	ug/L	1.0	0.13	1		05/27/22 20:57	95-63-6	
1,3,5-Trimethylbenzene	**<0.11**	ug/L	1.0	0.11	1		05/27/22 20:57	108-67-8	
Xylene (Total)	**<0.20**	ug/L	3.0	0.20	1		05/27/22 20:57	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	101	%.	75-125		1		05/27/22 20:57	2199-69-1	
4-Bromofluorobenzene (S)	103	%.	75-125		1		05/27/22 20:57	460-00-4	
Toluene-d8 (S)	87	%.	75-125		1		05/27/22 20:57	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

QC Batch: 818179
QC Batch Method: EPA 8260D
Analysis Method: EPA 8260D
Analysis Description: 8260D MSV UST-WATER
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10610205001

METHOD BLANK: 4336077 Matrix: Water
Associated Lab Samples: 10610205001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	<0.13	1.0	05/27/22 20:06	
1,3,5-Trimethylbenzene	ug/L	<0.11	1.0	05/27/22 20:06	
Ethylbenzene	ug/L	<0.11	1.0	05/27/22 20:06	
Methyl-tert-butyl ether	ug/L	<0.13	1.0	05/27/22 20:06	
Toluene	ug/L	<0.10	1.0	05/27/22 20:06	
1,2-Dichlorobenzene-d4 (S)	%.	100	75-125	05/27/22 20:06	
4-Bromofluorobenzene (S)	%.	103	75-125	05/27/22 20:06	
Toluene-d8 (S)	%.	106	75-125	05/27/22 20:06	

LABORATORY CONTROL SAMPLE: 4336078

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	20.4	102	75-125	
Ethylbenzene	ug/L	20	20.1	101	75-125	
Methyl-tert-butyl ether	ug/L	20	20.1	100	75-125	
Toluene	ug/L	20	18.4	92	74-125	
1,2-Dichlorobenzene-d4 (S)	%.			101	75-125	
4-Bromofluorobenzene (S)	%.			100	75-125	
Toluene-d8 (S)	%.			95	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4336126 4336127

Parameter	Units	10609930012 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	1.0	20	20	18.9	20.3	89	96	62-138	7	30	
1,3,5-Trimethylbenzene	ug/L	0.16J	20	20	18.4	19.5	91	97	64-135	6	30	
Ethylbenzene	ug/L	7.7	20	20	25.8	26.3	91	93	66-126	2	30	
Methyl-tert-butyl ether	ug/L	<0.13	20	20	17.4	18.0	87	90	65-137	4	30	
Toluene	ug/L	<0.10	20	20	16.3	17.6	82	88	69-131	7	30	
1,2-Dichlorobenzene-d4 (S)	%.						99	101	75-125			
4-Bromofluorobenzene (S)	%.						102	101	75-125			
Toluene-d8 (S)	%.						96	97	75-125			

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

QC Batch: 818207
QC Batch Method: EPA 8260D
Analysis Method: EPA 8260D
Analysis Description: 8260D MSV UST-WATER
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10610205003, 10610205004, 10610205005, 10610205006, 10610205007, 10610205008

METHOD BLANK: 4336191 Matrix: Water
Associated Lab Samples: 10610205003, 10610205004, 10610205005, 10610205006, 10610205007, 10610205008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	<0.13	1.0	05/27/22 20:41	
1,3,5-Trimethylbenzene	ug/L	<0.11	1.0	05/27/22 20:41	
Benzene	ug/L	<0.10	1.0	05/27/22 20:41	
Ethylbenzene	ug/L	<0.11	1.0	05/27/22 20:41	
Methyl-tert-butyl ether	ug/L	<0.13	1.0	05/27/22 20:41	
Toluene	ug/L	<0.10	1.0	05/27/22 20:41	
Xylene (Total)	ug/L	<0.20	3.0	05/27/22 20:41	
1,2-Dichlorobenzene-d4 (S)	%.	102	75-125	05/27/22 20:41	
4-Bromofluorobenzene (S)	%.	104	75-125	05/27/22 20:41	
Toluene-d8 (S)	%.	100	75-125	05/27/22 20:41	

LABORATORY CONTROL SAMPLE: 4336192

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	18.0	90	75-125	
1,3,5-Trimethylbenzene	ug/L	20	17.7	88	75-125	
Benzene	ug/L	20	17.4	87	73-125	
Ethylbenzene	ug/L	20	18.2	91	75-125	
Methyl-tert-butyl ether	ug/L	20	21.5	107	75-125	
Toluene	ug/L	20	17.8	89	74-125	
Xylene (Total)	ug/L	60	53.7	90	72-125	
1,2-Dichlorobenzene-d4 (S)	%.			99	75-125	
4-Bromofluorobenzene (S)	%.			105	75-125	
Toluene-d8 (S)	%.			102	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4336194 4336195

Parameter	Units	10610312003 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	ND	20	20	16.5	15.2	83	76	62-138	8	30	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	16.5	15.3	83	76	64-135	8	30	
Benzene	ug/L	ND	20	20	16.0	15.0	80	75	65-140	6	30	
Ethylbenzene	ug/L	ND	20	20	16.6	15.6	83	78	66-126	6	30	
Methyl-tert-butyl ether	ug/L	ND	20	20	17.5	16.9	87	84	65-137	3	30	
Toluene	ug/L	ND	20	20	16.1	15.2	81	76	69-131	6	30	
Xylene (Total)	ug/L	ND	60	60	49.5	45.9	83	77	68-136	8	30	
1,2-Dichlorobenzene-d4 (S)	%.						102	100	75-125			

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4336194 4336195

Parameter	Units	10610312003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
4-Bromofluorobenzene (S)	%.						105	105	75-125			
Toluene-d8 (S)	%.						102	101	75-125			

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

QC Batch: 818919
QC Batch Method: EPA 8260D
Analysis Method: EPA 8260D
Analysis Description: 8260D MSV UST-WATER
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10610205002, 10610205003, 10610205005, 10610205006

METHOD BLANK: 4339603 Matrix: Water
Associated Lab Samples: 10610205002, 10610205003, 10610205005, 10610205006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	<0.13	1.0	06/01/22 16:39	
1,3,5-Trimethylbenzene	ug/L	<0.11	1.0	06/01/22 16:39	
Benzene	ug/L	<0.10	1.0	06/01/22 16:39	
Ethylbenzene	ug/L	<0.11	1.0	06/01/22 16:39	
Methyl-tert-butyl ether	ug/L	<0.13	1.0	06/01/22 16:39	
Toluene	ug/L	<0.10	1.0	06/01/22 16:39	
Xylene (Total)	ug/L	<0.20	3.0	06/01/22 16:39	
1,2-Dichlorobenzene-d4 (S)	%.	101	75-125	06/01/22 16:39	
4-Bromofluorobenzene (S)	%.	104	75-125	06/01/22 16:39	
Toluene-d8 (S)	%.	100	75-125	06/01/22 16:39	

LABORATORY CONTROL SAMPLE: 4339604

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	18.0	90	75-125	
1,3,5-Trimethylbenzene	ug/L	20	18.1	91	75-125	
Benzene	ug/L	20	18.1	91	73-125	
Ethylbenzene	ug/L	20	18.8	94	75-125	
Methyl-tert-butyl ether	ug/L	20	20.7	103	75-125	
Toluene	ug/L	20	18.5	93	74-125	
Xylene (Total)	ug/L	60	55.8	93	72-125	
1,2-Dichlorobenzene-d4 (S)	%.			100	75-125	
4-Bromofluorobenzene (S)	%.			106	75-125	
Toluene-d8 (S)	%.			102	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4339609 4339610

Parameter	Units	10610502002 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	126	20	20	145	136	94	50	62-138	6	30	M1
1,3,5-Trimethylbenzene	ug/L	8.8	20	20	26.7	21.2	89	62	64-135	23	30	M1
Benzene	ug/L	478	20	20	484	509	31	154	65-140	5	30	E,P6
Ethylbenzene	ug/L	58.0	20	20	75.6	70.2	88	61	66-126	8	30	M1
Methyl-tert-butyl ether	ug/L	<0.13	20	20	19.0	13.6	95	68	65-137	33	30	R1
Toluene	ug/L	6.5	20	20	24.0	21.0	87	73	69-131	13	30	
Xylene (Total)	ug/L	281	60	60	328	248	78	-56	68-136	28	30	MS
1,2-Dichlorobenzene-d4 (S)	%.						101	102	75-125			P2

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4339609 4339610

Parameter	Units	10610502002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
4-Bromofluorobenzene (S)	%.						106	85	75-125			
Toluene-d8 (S)	%.						101	101	75-125			

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

QC Batch: 819534
QC Batch Method: EPA 8260D
Analysis Method: EPA 8260D
Analysis Description: 8260D MSV UST-WATER
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10610205001, 10610205007

METHOD BLANK: 4342739 Matrix: Water
Associated Lab Samples: 10610205001, 10610205007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	<0.10	1.0	06/07/22 02:02	
Ethylbenzene	ug/L	<0.11	1.0	06/07/22 02:02	
Xylene (Total)	ug/L	<0.20	3.0	06/07/22 02:02	
1,2-Dichlorobenzene-d4 (S)	%.	100	75-125	06/07/22 02:02	
4-Bromofluorobenzene (S)	%.	105	75-125	06/07/22 02:02	
Toluene-d8 (S)	%.	104	75-125	06/07/22 02:02	

LABORATORY CONTROL SAMPLE: 4342740

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	19.8	99	73-125	
Ethylbenzene	ug/L	20	19.5	97	75-125	
Xylene (Total)	ug/L	60	58.5	97	72-125	
1,2-Dichlorobenzene-d4 (S)	%.			101	75-125	
4-Bromofluorobenzene (S)	%.			101	75-125	
Toluene-d8 (S)	%.			102	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4342750 4342751

Parameter	Units	10610178004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/L	4880	1000	1000	6150	5910	126	103	65-140	4	30	
Ethylbenzene	ug/L	393	1000	1000	1260	1170	87	78	66-126	7	30	
Xylene (Total)	ug/L	2660	3000	3000	5480	5140	94	83	68-136	6	30	
1,2-Dichlorobenzene-d4 (S)	%.						100	98	75-125			
4-Bromofluorobenzene (S)	%.						102	92	75-125			
Toluene-d8 (S)	%.						97	101	75-125			

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REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

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.

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.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
MS	Analyte recovery in the matrix spike was outside QC limits for one or more of the constituent analytes used in the calculated result.
P2	Re-extraction or re-analysis could not be performed due to insufficient sample amount.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
R1	RPD value was outside control limits.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 49161494.02100 102 SRC GW TK40
Pace Project No.: 10610205

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10610205001	**MW-1 / T40**	EPA 8260D	818179		
10610205001	**MW-1 / T40**	EPA 8260D	819534		
10610205002	**MW-2 / T40**	EPA 8260D	818919		
10610205003	**MW-4 / T40**	EPA 8260D	818207		
10610205003	**MW-4 / T40**	EPA 8260D	818919		
10610205004	**MW-5 / T40**	EPA 8260D	818207		
10610205005	**MW-6 / T40**	EPA 8260D	818207		
10610205005	**MW-6 / T40**	EPA 8260D	818919		
10610205006	**MW-7 / T40**	EPA 8260D	818207		
10610205006	**MW-7 / T40**	EPA 8260D	818919		
10610205007	**TS-1 / T40**	EPA 8260D	818207		
10610205007	**TS-1 / T40**	EPA 8260D	819534		
10610205008	**Trip Blank**	EPA 8260D	818207		

Barr Engineering Co. Chain of Custody

Sample Origination State
☐ CO ☐ MI ☐ MN ☐ MO ☐ ND ☐ TX ☐ UT ☒ WI ☐ Other: _____

COC Number: № 589269
COC 1 of 1

Matrix Code: GW = Groundwater, SW = Surface Water, WW = Waste Water
Preservative Code: A = None, B = HCl, C = HNO_3, D = H_2SO_4

WO# : 10610205
10610205

REPORT TO	INVOICE TO
Company: Barr Engineering Co.	Company: Barr
Address: 325 S. 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: See GW TR40	Barr Project No: 49161494.02100 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	Analysis Requested: Water PVOCs	Soil % Solids	Preservative Code	Field Filtered Y/N	
1. MW-1 /T40	—			05/25/22	1115	GW	N	3	X		B	N	001
2. MW-2 /T40	—				1122		N	3	X		B	N	002
3. MW-4 /T40	—				1127		N	3	X		B	N	003
4. MW-5 /T40	—				1134		N	3	X		B	N	004
5. MW-6 /T40	—				1140		N	3	X		B	N	005
6. MW-7 /T40	—				1145		N	3	X		B	N	006
7. TS-1 /T40	—				1152		N	3	X		B	N	007
8. Trip Blank	—				—	—	N	2	X		B	N	008
9.													
10.													

BARR USE ONLY

Sampled by: JMJ3
Barr Proj. Manager: LMC
Barr DQ Manager: JET
Lab Name: Pace
Lab Location: GreenBay or Minneapolis

Relinquished by: [signature] On Ice? Y (N) Date 5/25/22 Time 1503
Received by: [signature] Date 5/25/22 Time 1503
Relinquished by: On Ice? Y N Date Time
Received by: Date Time

Samples Shipped VIA: ☐ Ground Courier ☐ Air Carrier ☐ Sampler ☐ Other: _____
Air Bill Number:
Lab WO:
Temperature on Receipt (°C): 2.3 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

	DC#_Title: ENV-FRM-MIN4-0150 v05_Sample Condition Upon Receipt (SCUR)
Pace ANALYTICAL SERVICES	Effective Date: 04/12/2022

Sample Condition Upon Receipt

Client Name: Barr Engineering

Project #:

WO# : 10610205

PM: MKH Due Date: 06/10/22

CLIENT: BARR

Courier: ☐Fed Ex ☐UPS ☐USPS ☐Client ☑Pace ☐SpeeDee ☐Commercial

See Exceptions ☐ENV-FRM-MIN4-0142

Tracking Number: _____

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(1336) ☐T3(0459) ☐T4(0254) ☐T5(0489) ☑T6(0235) ☐T7 (0042) ☐01339252/1710 ☐122639816 ☐140792808

Type of Ice: ☑Wet ☐Blue ☐None ☐Dry ☐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: 3.8 °C

Correction Factor: True 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: PM 5/26/22

Did samples originate in a quarantine zone within the United States: AL, AR, 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 ☐>8hr, <24 hrs, ☐>24 hrs
Short Hold Time Analysis (<72 hr)?	☐Yes	☑No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other
Rush Turn Around Time Requested?	☐Yes	☑No		6.
Sufficient Volume?	☑Yes	☐No		7.
Correct Containers Used? -Pace Containers Used?	☑Yes ☑Yes	☐No ☐No		8.
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 on Container Below:** **See Exception** ☐ **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? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐Yes	☐No	☑N/A	☐ NaOH ☐ HNO_3 ☐ H_2SO_4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☑Yes RM 5/26/22	☐No	☑N/A	Positive for Res. Chlorine? ☐Yes ☐No **pH Paper Lot#** **See Exception** ☐ **ENV-FRM-MIN4-0142**
				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Headspace in Methyl Mercury Container?	☐Yes	☐No	☑N/A	
Extra labels present on soil VOA or WIDRO containers?	☐Yes	☐No	☑N/A	13. **See Exception** ☐ **ENV-FRM-MIN4-0140**
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☑No	☐N/A	
Trip Blank Present?	☑Yes	☐No	☐N/A	14.
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:** 5/27/22

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: RVC (2)

Attachment B

Well Abandonment Form

(MP-3/T40)

State of Wis., Dept. of Natural Resources
dnr.wi.gov

MP-3/ T40

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between $10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

☒ **Verification Only of Fill and Seal**

Route to DNR Bureau:
☐ Drinking Water ☐ Watershed/Wastewater ☒ Remediation/Redevelopment
☐ Waste Management ☐ Other: _____

1. Well Location Information

County	WI Unique Well # of Removed Well	Hicap #
Douglas	___ ___ ___ ___ ___	

Latitude / Longitude (see instructions): 46.692141 N, -92.073087 W
Format Code: ☒ DD ☐ DDM
Method Code: ☐ GPS008 ☐ SCR002 ☒ OTH001

¼ / ¼	¼	Section	Township	Range
SW	SW	25	N	14 ☐ E ☒ W

or Gov't Lot #

Well Street Address: 2407 Stinson Ave

Well City, Village or Town	Well ZIP Code
Superior	54880

Subdivision Name	Lot #

Reason for Removal from Service	WI Unique Well # of Replacement Well
well screen above grade	___ ___ ___ ___ ___

2. Facility / Owner Information

Facility Name: Superior Refining Company
Facility ID (FID or PWS): 816009590
License/Permit/Monitoring #:
Original Well Owner:
Present Well Owner: Superior Refining Company
Mailing Address of Present Owner: 2407 Stinson Ave

City of Present Owner	State	ZIP Code
Superior	WI	54880

3. Filled & Sealed Well / Drillhole / Borehole Information

☒ Monitoring Well ☐ Water Well ☐ Borehole / Drillhole

Original Construction Date (mm/dd/yyyy):

If a Well Construction Report is available, please attach.

Construction Type:
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (specify): _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
	6"

Lower Drillhole Diameter (in.)	Casing Depth (ft.)

Was well annular space grouted? ☐ Yes ☐ No ☐ Unknown

If yes, to what depth (feet)?	Depth to Water (feet)

4. Pump, Liner, Screen, Casing & Sealing Material

	Yes	No	N/A
Pump and piping removed?	☐	☐	☒
Liner(s) removed?	☐	☐	☒
Liner(s) perforated?	☐	☐	☒
Screen removed?	☐	☒	☐
Casing left in place?	☒	☐	☐
Was casing cut off below surface?	☒	☐	☐
Did sealing material rise to surface?	☐	☒	☐
Did material settle after 24 hours?	☐	☐	☒
If yes, was hole retopped?	☐	☐	☒
If bentonite chips were used, were they hydrated with water from a known safe source?	☒	☐	☐

Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☒ Screened & Poured (Bentonite Chips) ☐ Other (Explain): _____

Sealing Materials
☐ Neat Cement Grout ☐ Concrete
☐ Sand-Cement (Concrete) Grout ☒ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
☒ Bentonite Chips ☐ Bentonite - Cement Grout
☐ Granular Bentonite ☐ Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
topsoil	Surface	0.1	
sand	0.1	1.1	~2,500 mL	
bentonite chips 3/8"	1.1	7.92	~5,600 mL	

6. Comments

9/1/2022 - bentonite chips added to well, 9/20/2022 -Pro-top cut down to ground surface, sand and topsoil

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)
Kinzey Schneider		09/01/2022

Street or Route	Telephone Number
325 South Lake Avenue	(218)529-8200

City	State	ZIP Code	Signature of Person Doing Work	Date Signed
Duluth	MN	55802	Kinzey Schneider	12/1/2022

DNR Use Only

Date Received	Noted By

Comments: