APPENDIX C

Phase II Investigation

3942 Woodland Ave.
Duluth, Minnesota

Prepared for
The City of Duluth

December 2021

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Phase II Investigation
3942 Woodland Ave.
Duluth, MN

December 2021

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Executive Summary

This Phase II Investigation Report describes results of investigation field work completed on a 0.58-acre property at 3942 Woodland Ave. in Duluth, Minnesota (Property), on behalf of the City of Duluth (City). The Property location is shown on Figure 1.

The purpose of the Phase II investigation was to characterize potentially impacted soil, groundwater, and soil vapor in areas where recognized environmental conditions (RECs) were identified in a Phase I Environmental Site Assessment (ESA) (Barr, 2021a). Data from the investigation will be used to inform buyer's of the Property of potential environment risks or liabilities. This field investigation was conducted by Barr Engineering Co. (Barr) on November 1-5 and 8-11, 2021.

The scope of work included removal of three underground storage tanks (USTs), associated fuel dispenser components, and any piping related to the UST and dispenser system at the Property to gain access to underlying soil for evaluation of potential petroleum contamination. Soil samples collected from the UST and fuel dispenser excavations were screened for organic vapors with a photoionization detector (PID) and inspected for other evidence of contamination such as staining, obvious odors, discoloration, and/or sheen. Two soil samples were collected under each of the three USTs (one from each end) for a total of six samples (B-1 through B-6). One soil sample was collected from beneath each of the five dispensers for a total of five samples (B-6 through B-11). Soil samples were submitted for laboratory analyses of benzene, toluene, ethylbenzene, and xylenes (BTEX), gasoline range organics (GRO) and/or diesel range organics (DRO). Three sub-slab vapor monitoring points were installed on the Property to collect soil vapor samples. One Sub-slab vapor location was in the former convenience store building (SS-1) and the other two locations were in the parking lot (SS-2 and SS-3) (Figure 2). Soil vapor samples were submitted for laboratory analysis of volatile organic compounds (VOCs).

None of the soil analytical results exceeded MPCA Residential/Recreation Chronic Soil Reference Values (SRVs) or the Industrial/Commercial Chronic SRVs.

Soil vapor concentrations of 1,3-butadiene exceeded the MPCA Residential 33x Intrusion Screening Valves (ISV) and Commercial/Industrial 33x ISV in sample SS-2 and the Residential ISV in sample SS-3. Based on the results of the Phase I ESA and on information obtained from review of regulatory files, 1,3-butadiene was not identified as a contaminant of concern for the Property and therefore, it is assumed that the presence of 1,3-butadiene is an artifact of the sampling process and not indicative of a release of 1,3-butadiene at the Property.

The detections in soil vapor were limited to petroleum compounds that may be attributed to the former land use and closed leaking underground tank site (leaksite) associated with the Property. At the time of site closure of the previous leaksite, the MPCA determined that the presence of the residual petroleum contamination did not present a risk to human health and the environment.

Because this Property is associated with a former closed leaksite the residual nature of the detected petroleum compounds are unlikely to constitute a concern to the MPCA. Consequently, it is unlikely the

MPCA would elect to reopen the leaksite, the presence of petroleum compounds in soil vapor will not require additional investigation but should be considered as part of future Property development plans. As a result, each of the RECs identified in the Phase I ESA (Barr, 2021a) have been resolved with no additional contamination sources identified; no additional investigation is recommended.

1 Introduction

This Phase II Investigation Report describes results of investigative field work at 3942 Woodland Ave. (Property) located in the City of Duluth, St. Louis County, Minnesota.

The Property is adjoined by Woodland Avenue to the west and E Redwing Street to the north in Duluth, Minnesota. The Property included: a paved parking area over most of the lot and gas station (inactive) infrastructure including an overhead canopy that covered fuel dispenser islands (dispensers were previously removed) and a convenience store building located on the eastern side the Property. A topographic map with the Property location is shown on Figure 1. The Property layout with existing features is shown on Figure 2. The 0.58-acre Property is located at 3942 Woodland Ave. in the NE ¼ of the NW ¼, Section 2, Township 50N, Range 14W, in Duluth, St. Louis County, Minnesota and is identified as St. Louis County Parcel 010-4670-00590. The Property boundaries are shown on Figure 2.

This investigation was conducted by Barr Engineering Co. (Barr) on behalf of the City of Duluth (City). Investigative activities were conducted on October 11, and November 1-5 and 8-11, 2021 in accordance with the *Sampling and Analysis Plan (SAP)* (Barr, 2021c). The Phase II Investigation was conducted under the City cooperative agreement with the U.S. Environmental Protection Agency (EPA): Assessment Grant (U.S. EPA Grant Number: BF-00E02719 (Grant)). The Minnesota Pollution Control Agency (MPCA) provided a Petroleum Eligibility Determination (ED) approval for the Property on June 10, 2021 and the EPA approved the Hazardous Substances ED on April 15, 2021.

1.1 Project Objectives

The SAP was developed based on the results of the *Phase I Environmental Site Assessment Report* (Phase I ESA) (Barr, 2021a). The objectives of the Phase II Investigation were to:

1) prepare a site-specific Project Health and Safety Plan (PHASP) to support execution of the work;
2) investigate RECs identified in the Phase I ESA;
3) perform a screening evaluation of risk to human health and the environment using soil, groundwater and soil vapor quality results as related to worker safety during future development activities and Property use;
4) coordinate the removal of three underground storage tanks (USTs), associated fuel dispenser components, and any piping related to the UST and dispenser system at the Property using a contractor certified by the Minnesota Pollution Control Agency (MPCA). The USTs, dispenser components and piping needed to be removed to gain access to underlying soil for evaluation of potential petroleum contamination;
5) collect soil, groundwater, and soil vapor samples for field screening and laboratory analyses to determine if petroleum compounds are present at the site;

6) identify whether additional investigation and/or remedial actions are required to meet state-wide soil, groundwater, and soil vapor cleanup criteria applicable to the proposed future uses; and

7) document the investigation methods and results in a report;

8) use data to inform the City of Duluth of potential risks associated with the Property and identify options for liability protection for potential future site owners.

The investigation work was not conducted to fully delineate the extent of soil, groundwater, and/or soil vapor contamination, if encountered, but rather to document the presence of absence of contamination in the potential REC areas defined in the Phase I ESA.

1.2 Site Background Information

The Property is currently owned by the State of Minnesota through tax forfeiture and is managed by St. Louis County. The Property most recently operated as a retail gasoline station and convenience store that was built in 1971 and has not been active/occupied since 2015 (Barr, 2021a). The convenience store building has a footprint of 868 square feet and is located on the eastern half of the Property. The Property also includes a paved parking area over most of the lot and an overhead canopy that covered the former fuel dispenser islands. The above-ground fuel dispensers had been removed; however, all below ground dispenser components including piping, remained in place. Four flush mount monitoring wells were present on the northern half of the Property. UST access covers are located in the northwest quarter of the property. Note that the monitoring wells were only located around the USTs and not the dispensers or associated piping, which can be additional potential sources for petroleum contamination (Barr, 2021a).

The Property is currently zoned mixed-use neighborhood. The land use categories of the adjoining properties are mixed-use neighborhood, residential traditional, and park. Current land use of the adjoining properties includes an auto repair shop to the north, a gas station to the northwest, a park space/playground with school to the west, and residential single-family homes to the south and east.

The following is a brief site history of the Property. Historically the northern third of the Property was undeveloped in 1939 while the southern portion of the Property contained residential homes. By 1942 an auto repair shop was built on the northern half of the Property. In 1971 the current convenience store and gasoline station were built on the Property and the previous residential houses were removed sometime between 1969 and 1971. The Convenience Store and gasoline station became inactive in 2015 (Barr, 2021a).

The building at the Property is connected to City municipal drinking water, sanitary services, and natural gas. Additional details regarding the Property history and background are presented in the Phase I ESA (Barr, 2021a).

The current use of adjoining properties is mixed-use business and mixed-use commercial properties and includes a city bus facility, auto transmission shop, motel, freight truck terminal, and interstate highway corridor.

1.3 Previous Investigations

The following includes a summary of previous investigations which were presented in greater detail in the Phase I ESA (Barr, 2021a). File information for the Spur Station #3129 (MPCA, 2021) was received from the MPCA after completion of the Phase I ESA. Further information about previous investigations and regulatory file reviews is presented in the Phase I ESA (Barr, 2021a) and SAP (Barr, 2021c).

- May 2021: Phase I ESA conducted by Barr on behalf of the City (Barr, 2021a). Two RECs were identified on or nearby the Property which included: historical use as an auto repair garage and gasoline station and historical USTs on the Property; and an adjoining leaking underground storage tank (LUST) site. The identified RECs are described further in the following section.
- A regulatory database report obtained for the 2021 Phase I ESA indicates that there is a MPCA-reported LUST associated with the Property - Spur Station #3129 (MPCA, 2021). The regulatory report indicates the status of the listing as inactive and closed in 1999 (MPCA, 1999; Appendix A). Records related to the investigation were requested from the MPCA but were not provided in time for review the Phase I review but were received and reviewed for consideration in preparation of the SAP (Barr, 2021c). Only a limited amount of investigation information was available from the MPCA (MPCA, 2021). A leak site was discovered at the Property and was reported on September 23, 1996. It is unknown if contaminated soils remain. The leak site (closed leak file number LS0009661) was closed by the MPCA on March 9, 1999 (MPCA, 1999; Appendix A).

Based on the results of the Phase I ESA and on information obtained from review of regulatory files, the contaminants of concern for the Property include benzene, toluene, ethylbenzene, and xylenes (BTEX), gasoline range organics (GRO), diesel range organics (DRO).

The RECs were evaluated during this Phase II Investigation. Further information about the RECs are presented in the Phase I ESA (Barr, 2021a) and SAP (Barr, 2021c).

2 Investigation Activities

Field activities for the Phase II investigation were conducted on October 11, November 1-5, and 8-11, 2021. As detailed in the Phase II Investigation SAP (Barr, 2021c), the scope of work included the removal of USTs and associated fuel pump infrastructure, soil sample collection following the UST and infrastructure removal (B-1 to B-11), and collection of three sub-slab vapor samples (SS-1 to SS-3). Soil and vapor samples were collected for the purpose of characterizing soil quality. The soil and sub-slab vapor sample locations are shown on Figure 2.

The investigative field methods and laboratory analyses were conducted in accordance with the *Quality Assurance Project Plan* (QAPP) prepared on behalf of the City for the EPA Brownfields Assessment Grant Program (Barr 2020a, Revision 0.0), the subsequent QAPP Update Letter (Barr, 2021b) and on the SAP (Barr, 2021c). Specific project tasks are described in the following paragraphs. A photographic log of representative investigation activities is provided in Appendix B.

2.1 USTs and Associated Infrastructure Removal

Barr coordinated with Twin Ports Environmental Construction (TPEC) to remove three USTs, associated fuel dispenser components, and any piping related to the UST and dispenser system at the Property. TPEC removed the station canopy on November 1-3. On November 4 TPEC prepared the concrete ground surface above the USTs and fuel dispensers for excavation. On November 5 TPEC removed the concrete above the USTs and on November 8 TPEC excavated and removed the three USTs. Petroleum liquids and sludges from the tanks and piping were removed by OSI Environmental, Inc. of Eveleth, MN. During excavation activities TPEC removed three flush mount monitoring wells during UST excavation activities. The monitoring wells did not exceed 13 feet in depth below ground surface (bgs). Following tank removal Barr collected soil samples for field screening and laboratory analysis. Further information regarding soil sampling is found in Section 2.2 below. After sampling was complete TPEC backfilled the excavation with clean sand and class V gravel. TPEC cleaned and removed the USTs from the Property on November 9 and 10.

On November 9 TPEC removed the fuel dispenser and piping infrastructure. Barr collected soil samples for field screening and analytical sampling (see Section 2.2 below). TPEC backfilled the excavations with sand and class V gravel on November 9-11 after completion of soil sampling.

TPEC notified the MPCA at least 10 days prior to the removal of the USTs and associated infrastructure and after there removal. MPCA notification forms are provided in Appendix C.

2.2 Soil Sampling following UST and Infrastructure Removal

Barr coordinated with TPEC to remove the USTs and associated infrastructure which allowed access to underlying soils to complete the objectives of the investigation. Soil samples were collected on November 8 and 9, 2021.

Soil samples were classified in the field in accordance with ASTM-2488, *Standard Soil Practice for Description and Identification of Soils (Visual/Manual Method)*.

Soil samples and excavations bottoms and sidewalls field screening samples were screened for the presence of organic vapors with a 10.6 eV photoionization detector (PID) following headspace procedures in accordance with the QAPP. Additionally, soil field screening samples were inspected for other evidence of contamination such as staining, obvious odors, discoloration, and/or sheen and were field documented. Forty-one field screening samples were collected and field screening observations are presented in Table 1.

Soil samples were collected in accordance with MPCA Guidance Document t-u2-11, *Site assessment for underground storage tanks with no apparent contamination* (MPCA, 2010). One soil sample was collected under each end of each of the three USTs for a total of six samples (B-1 through B-6). One soil sample was collected from beneath each of the five dispensers for a total of five samples (B-6 through B-11). No samples were collected under joints of the underground piping as the piping was double-walled and flexible and therefore had no joints. The edge of the dispenser islands were approximately 25 feet from the ends of the USTS so there was not a long piping run between the USTs and dispensers.

Sample collection detail is presented on Table 2. Soil samples were submitted for laboratory analysis for GRO and/or DRO, and BTEX.

Three quality assurance/quality control (QA/QC) samples were collected and consisted of one masked soil field duplicate (M-1), one soil field blank, and one soil trip blank. The masked field duplicate soil sample was collected from sample B-2 location and the field blank was collected at sample B-5 location. Laboratory procedures included evaluation of matrix spike (MS) and matrix spike duplicate (MSD) analyses as discussed further in the Quality Assurance/Quality Control (QA/QC) Review in Appendix D.

Legend Technical Services of St. Paul, Minnesota (Legend) performed the laboratory analysis, in accordance with the SAP (Barr, 2021c).

2.3 Sub-Slab Vapor Sampling

On October 11, 2021, three sub-slab vapor sampling points were installed on the Property. One Sub-slab vapor location was in the convenience building (SS-1) and the other two locations were in parking lot (SS-2 and SS-3; Figure 2; Appendix B). The surface of the convenience building at the sampling location was concrete and the surface of the parking lot sampling locations was asphalt. The sub-slab vapor sampling points were installed by Barr using a rotary hammer drill to bore through the concrete and asphalt slabs. Sub-slab vapor sampling point SS-1 was 7 inches below the surface of the concrete. The depth of sub-slab vapor sampling points below the surface of the asphalt was 8 inches at SS-2 and 5 inches at SS-3. A permanent sub-slab vapor monitoring point was installed at SS-1 and temporary sub-slab vapor monitoring points were installed at SS-2 and SS-3. A PID was also used to field screen for organic vapors at each sub-slab sample location following collection of the sub-slab vapor sample.

Sub-slab samples were collected using certified air canisters in accordance with the SAP (Barr, 2021c). Sub-slab samples were submitted to Legend for analysis for VOCs in accordance with method TO-15. Sample collection detail is presented on Table 2.

2.4 Deviations from Original Work Scope

Deviations from the SAP scope of work (Barr, 2021c) were determined based on conditions encountered while in the field. None of the deviations impede the ability of this investigation to meet the objectives. Adjustments to the original scope included:

- Sub-slab vapor sampling location SS-1 was offset horizontally approximately 18 feet and SS-2 was offset horizontally approximately 5 feet from the proposed location identified in the SAP to avoid utilities.
- No groundwater samples were collected from the on-site flush mount monitoring wells as the well covers were rusted and some were partially covered in cement and could not be opened. Additionally, no groundwater was observed in the excavation.
- No soil samples were collected under joints of the underground piping as the piping was double-walled and flexible and therefore had no joints.

3 Results

3.1 Soil Characterization

Soil encountered in the UST excavation consisted primary of silty sand with a layer of fabric at 3 feet below ground surface (bgs) followed by 1 foot of pea gravel above the USTs. Silty sand was encountered adjacent to the tanks from 4 to 12 feet bgs followed by 2 feet of poorly graded gravel.

Soil encountered in the dispenser excavations consisted primary of 3 to 3.5 feet of gravel fill material overlaying 0.5 to 2 feet of lean clay with sand or silty sand. A hard obstruction, possibly rock, was observed at 6 feet bgs at the three western dispenser excavations.

Groundwater was not observed in the UST or dispenser excavations.

3.2 Soil Field Screening

Forty-one soil samples were screened for organic vapors with a 10.6 eV PID following headspace procedures in accordance with the QAPP (Barr, 2020 and Barr, 2020b). Additionally, soil samples were inspected for other evidence of contamination such as staining, obvious odors, discoloration, and/or sheen and were field documented. At each of the three sub-slab borings, a PID measurement was also made through the vapor sampling points in accordance with the SAP (Barr, 2021c).

There were no PID headspace readings greater than 10 parts per million (ppm) at field screening and sample locations or at sub-slab vapor sampling locations. There was no petroleum staining, odors, discoloration, or sheen observed in soil at any of the field screening or sample locations. Field screening observations and PID headspace readings are summarized in Table 1.

3.3 Sample Collection and Analysis

The laboratory analytical results of the soil samples are presented in Table 3 and soil vapor samples in Table 4. Discrete soil samples were collected based on the target locations identified in the SAP (Barr, 2021c) and on observations made in the field. Sub-slab vapor sample points were installed to collect soil vapor samples from the exterior and interior of the building as identified in the SAP (Barr, 2021c).

Eleven soil samples and three soil vapor samples were collected for a combination of parameters as identified on Table 2 which includes sample depths and analyses requested from the laboratory. Laboratory reports are provided in Appendix E.

3.4 Analytical Results

3.4.1 Soil

Laboratory analytical results of the soil samples are presented in Table 3. Analytical results were compared to the MPCA Residential/Recreation Chronic SRVs the Industrial/Commercial Chronic SRVs. These criteria are risk-based screening criteria developed by the MPCA for evaluating possible health risks at properties. SRVs evaluate direct contact exposure scenarios for residential, recreational, and industrial land uses and

for short-term worker exposure to concentrations of specific chemicals or compounds. A SRV does not exist for GRO or DRO. However, the MPCA has provided field screening and analytical concentration criteria for use in evaluating whether soil is suitable for use as unregulated fill (MPCA, 2012). To summarize, in order for soil to be used as unregulated fill, it must be free from solid waste and debris, soil organic vapor field screening readings must be less than 10 ppm, GRO and DRO concentrations must be less than 100 milligrams per kilogram (mg/kg), and analyte concentrations must be less than the MPCA Residential/Recreation Chronic SRVs and the Industrial/Commercial Chronic SRVs.

None of the soil analytical results exceeded MPCA Residential/Recreation Chronic SRVs or the Industrial/Commercial Chronic SRVs. There were no sample detects of BTEX or GRO. DRO was detected in samples B-1, B-9, and B-11 with concentrations between 5.2 mg/kg and 8.1 mg/kg which is below the 100 mg/kg MPCA unregulated fill criteria.

3.4.2 Sub-Slab Vapor Sample

Laboratory analytical results for the sub-slab vapor samples are presented in Table 4. The results were compared to the MPCA Residential and Commercial/Industrial 33x Intrusion Screening Values (ISVs) and to Residential and Commercial/Industrial ISVs for Vapor Intrusion Risk Evaluation (MPCA, 2020). As mentioned above the Property is not currently used for residential or recreational use, so residential and/or recreational criteria would only be applicable if the Property use changes in the future. ISVs are health risk related values for indoor air quality. The 33x ISVs are health risk related values for soil vapor quality in soil under a building slab or basement floor that may migrate into a building. Compounds that exceed the applicable screening criteria are identified on Table 4 by bold, underlined, and shaded text in the table result cells. A copy of the laboratory analytical report is included in Appendix E.

Concentrations of 1,3-butadiene exceeded the Residential 33x ISV and Commercial/Industrial 33x ISV in sample SS-2 and the Residential ISV in sample SS-3. However, 1,3-butadiene is commonly detected in soil vapor samples at concentrations above the Residential and Commercial/Industrial 33x ISVs. Based on the results of the Phase I ESA and on information obtained from review of regulatory files, 1,3-butadiene was not identified as a contaminant of concern for the Property. Therefore, it is assumed that the presence of 1,3-butadiene is an artifact of the sampling process and not indicative of a release of 1,3-butadiene at the Property.

Several other compounds exceeded criteria and are summarized below:

- Concentrations of benzene exceeded the MPCA Residential and Industrial ISVs but not the 33x ISVs in samples SS-2 and SS-3.
- Concentrations of ethylbenzene exceeded the MPCA Residential ISVs but not the 33x ISVs in all soil vapor samples.
- Concentrations of naphthalene exceeded the MPCA Residential ISVs but not the 33x ISVs in sample SS-2.

3.4.3 Quality Assurance/Quality Control (QA/QC) Review

Laboratory analyses of soil and soil vapor samples was performed by Legend. A QA/QC review was conducted to assess the precision, bias, sensitivity, representativeness, comparability, and completeness of the laboratory data and to assign appropriate data qualifiers. The validated results were determined to be acceptable, as qualified, for the purposes of the project as defined by the data quality objectives in the QAPP (Barr, 2020 and Barr 2021b). A summary of the data validation and usability review is presented in Appendix D.

4 Conclusions and Recommendations

The purpose of this investigation was to characterize the soil, groundwater, and soil vapor quality at the Property and to the extent possible, identify the presence and/or potential presence of contaminated soil, groundwater, or soil vapor as a result of the RECs identified in the Phase I ESA (Barr, 2021a).

None of the soil analytical results exceeded MPCA Residential/Recreation Chronic SRVs or the Industrial/Commercial Chronic SRVs.

Concentrations of benzene in the soil vapor samples were detected on the Property that exceeded the MPCA Residential and Industrial ISVs but not the 33x ISVs. Concentrations of ethylbenzene and naphthalene in the soil vapor samples were detected on the Property that exceeded the MPCA Residential ISVs but not the 33x ISVs.

Concentrations of 1,3-butadiene exceeded the Residential 33x ISV and Commercial/Industrial 33x ISV in sample SS-2 and the Residential ISV in sample SS-3. Based on the results of the Phase I ESA and on information obtained from review of regulatory files, 1,3-butadiene was not identified as a contaminant of concern for the Property and therefore, it is assumed that the presence of 1,3-butadiene is an artifact of the sampling process and not indicative of a release of 1,3-butadiene at the Property.

The detections in soil vapor were limited to petroleum compounds that may be attributed to the former land use and closed leaksite associated with the Property. At the time of site closure, the MPCA determined that the presence of the residual petroleum contamination did not present a risk to human health and the environment.

Because this Property is associated with a former closed leaksite the residual nature of the detected petroleum compounds are unlikely to constitute a concern to the MPCA. Consequently, it is unlikely the MPCA would elect to reopen the leaksite, the presence of petroleum compounds in soil vapor will not require additional investigation but should be considered as part of future Property development plans. As a result, each of the RECs identified in the Phase I ESA (Barr, 2021a) have been resolved with no additional contamination sources identified; no additional investigation is recommended.

References

Barr Engineering Company (Barr), 2020. *Quality Assurance Project Plan – U.S. EPA Brownfields Assessment Grant, Hazardous Substances and Petroleum, Duluth, Minnesota*, Revision 0.0, April 2020 (approved April 22, 2020).

Barr, 2021a. *Phase I Environmental Site Assessment, 3942 Woodland Ave, Duluth, Minnesota.* Prepared for the City of Duluth. May 2021.

Barr, 2021b. *Quality Assurance Project Plan (QAPP) Annual Update Letter, City of Duluth U.S. EPA Community Wide Assessment Grant, Grant Number: BF-00E02719*. May 3, 2021. (approved May4, 2021).

Barr, 2021c. *Sampling and Analysis Plan -- Phase II Investigation, 3942 Woodland Ave., Duluth Minnesota.* August 2, 2021.

Minnesota Pollution Control Agency (MPCA), 1999. *Petroleum Tank Release Site File Closure Woodland Spur Station #1329, 3942 Woodland Avenue, Duluth, Site ID# LEAK00009661,* March 9, 1999.

MPCA, 2010. *Site assessment for underground storage tanks with no apparent contamination,* Guidance Document t-u2-11.

MPCA, 2012. *Best Management Practices for the Off-Site Reuse of Unregulated Fill.* Guidance document c-rem1-01, February 2012.

MPCA, 2020. *Vapor investigation and mitigation decision best management practices*. Guidance document c-rem3-06e. April 2020.

MPCA, 2021. *Database field regarding Leak Site Spur Station #3129.* Sent via email to Barr, May 18, 2021.

Tables

Table 1

SITE INVESTIGATION FIELD SAMPLING AND SCREENING LOG

Location: ~~Milepost or Facility~~ kmJB Woodland phase II

Date: 11/8/2021 (11/8/2021)

Sampler: kmJB

Equipment used: Photo -ionization detector with 10.6 eV lamp

Background Headspace: 0.0 ppm

Calibration Time: 1230

Sample Nomenclature *(Location - sample type - #)*:

Soil Sample Types: **R** = *Removed Sample* ; **S** = *Sidewall Sample* ; **B** = *Bottom Sample* ; **Stockpile** = *Stockpile Sample*

Sample ID	Depth (FT)	Time (military)	Soil Type (USCS)	Color/ Discolor	Odor/ Sheen	Headspace Reading (ppm)
Example: R-1	4	16:30	CL	Reddish brown	Petroleum/ Rainbow	275
S1	2	1305	SM	tan Brown	None/None	1.7
S2	2	1305				1.3
S3	2	1304				1.9
S4	2	1307				4.3
S5	2	1309				2.9
S6	2	1309				1.9
S7	2	1312				0.9
S8	2	1312				0.2
S9	2	1312				2.4
S10	2	1313				1.4
S11	2	1314				0.4
S12	2	1315				0.5
S13	2	1315				0.6
S14	2	1317				1.2
B1	5	1402				3.4
B2	5	1405				4.2
B3	14	1500	Gravel	Brown		0.7
B4	14	1502				1.1
B5	14	1505				1.1
S15	12	1507	SM			2.0
S16	12	1508				1.2
S17	12	1508				1.4
B6	14	1517	Gravel			0.7
B7	14	1517				1.2
B8	14	1518				3.3

SITE SKETCH: *north is up; excavation extents & depths, impacted areas, sample locations, borings, wells, structures, utilities, natural features...* **1 inch/grid = 15 FEET**

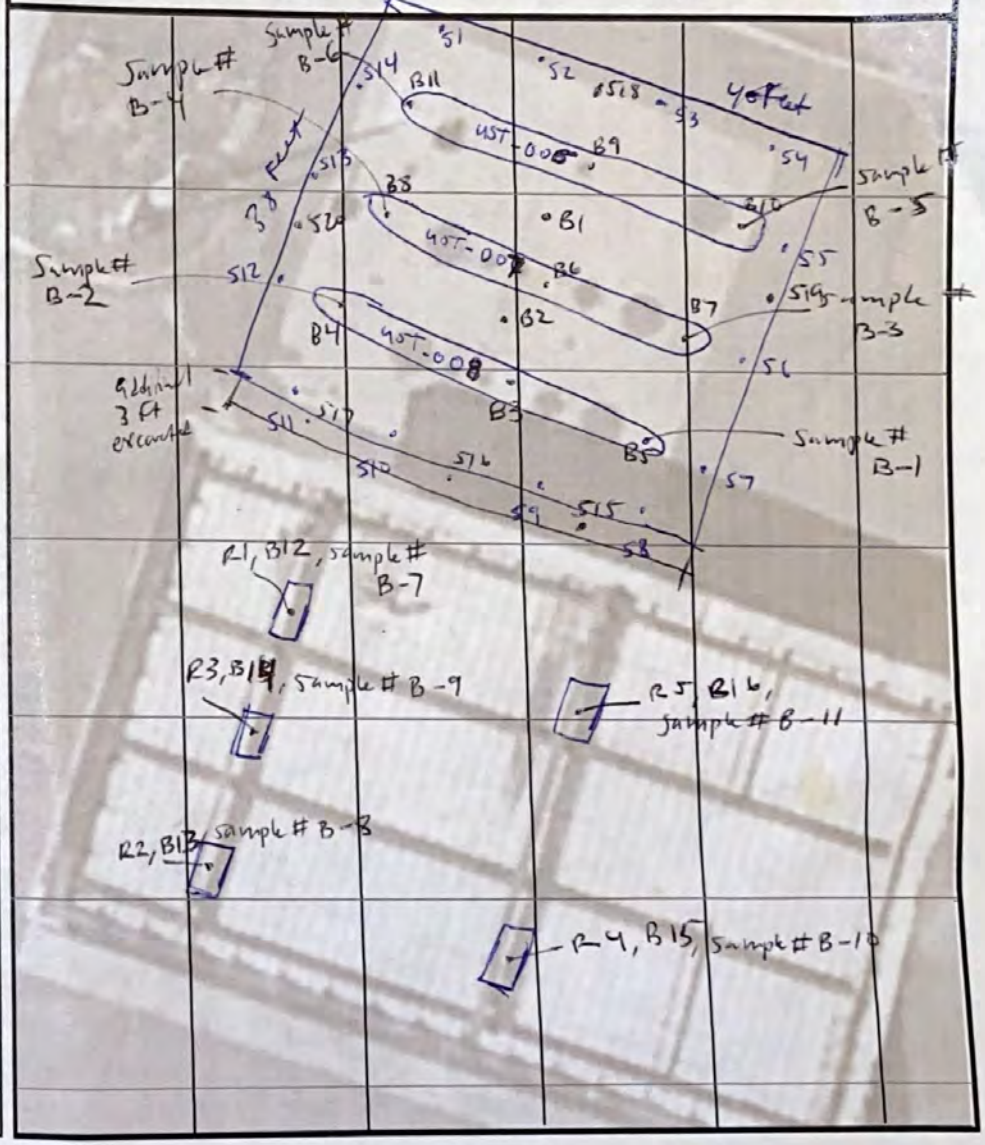


Table 1

SITE INVESTIGATION FIELD SAMPLING AND SCREENING LOG

Location: *Milepost or Facility* Woodlark phase II

Date: 11/8/21; 11/9/21

Sampler: KMB

Equipment used: photo *-ionization detector with* 10.6 *eV lamp*

Background Headspace: 0.2 ppm

Calibration Time: 1130

Sample Nomenclature *(Location - sample type - #)*:

Soil Sample Types: **R** = *Removed Sample* ; **S** = *Sidewall Sample* ; **B** = *Bottom Sample* ; **Stockpile** = *Stockpile Sample*

Sample ID	Depth (FT)	Time (military)	Soil Type (USCS)	Color/ Discolor	Odor/ Sheen	Headspace Reading (ppm)
Example: R-1	4	16:30	CL	Reddish brown	Petroleum/ Rainbow	275
B9	14	1600	Gravel	Brown	None/none	0.7
B10	14	1602	↓	↓	↓	0.4
B11	14	1605	↓	↓	↓	0.9
S18	12	1608	Sand	↓	↓	2.1
S19	10	1610	↓	↓	↓	1.0
S20	8	1612	↓	↓	↓	0.4
R1	3	1202	Gravel	brown	None/none	1.3
B12	6	1208	Sandy/Silt Lean clay	reddish brown	↓	1.1
R2	3.5	1213	Gravel	brown	↓	2.4
B13	6	1226	Silty/Sand	brown	↓	1.7
R3	3	1232	Gravel	brown	↓	2.2
B14	6	1239	G/S with silt/clay	reddish brown	↓	1.9
R4	3.5	1309	Gravel	brown	↓	2.3
B15	7.5	1314	silty/Sand	brown	↓	1.7
R5	3	1330	Gravel	brown	↓	2.6
B16	7.5	1337	Silty clay	reddish brown	↓	3.1

SITE SKETCH: *north is up; excavation extents & depths, impacted areas, sample locations, borings, wells, structures, utilities, natural features...* ***1 inch/grid = 15 FEET***

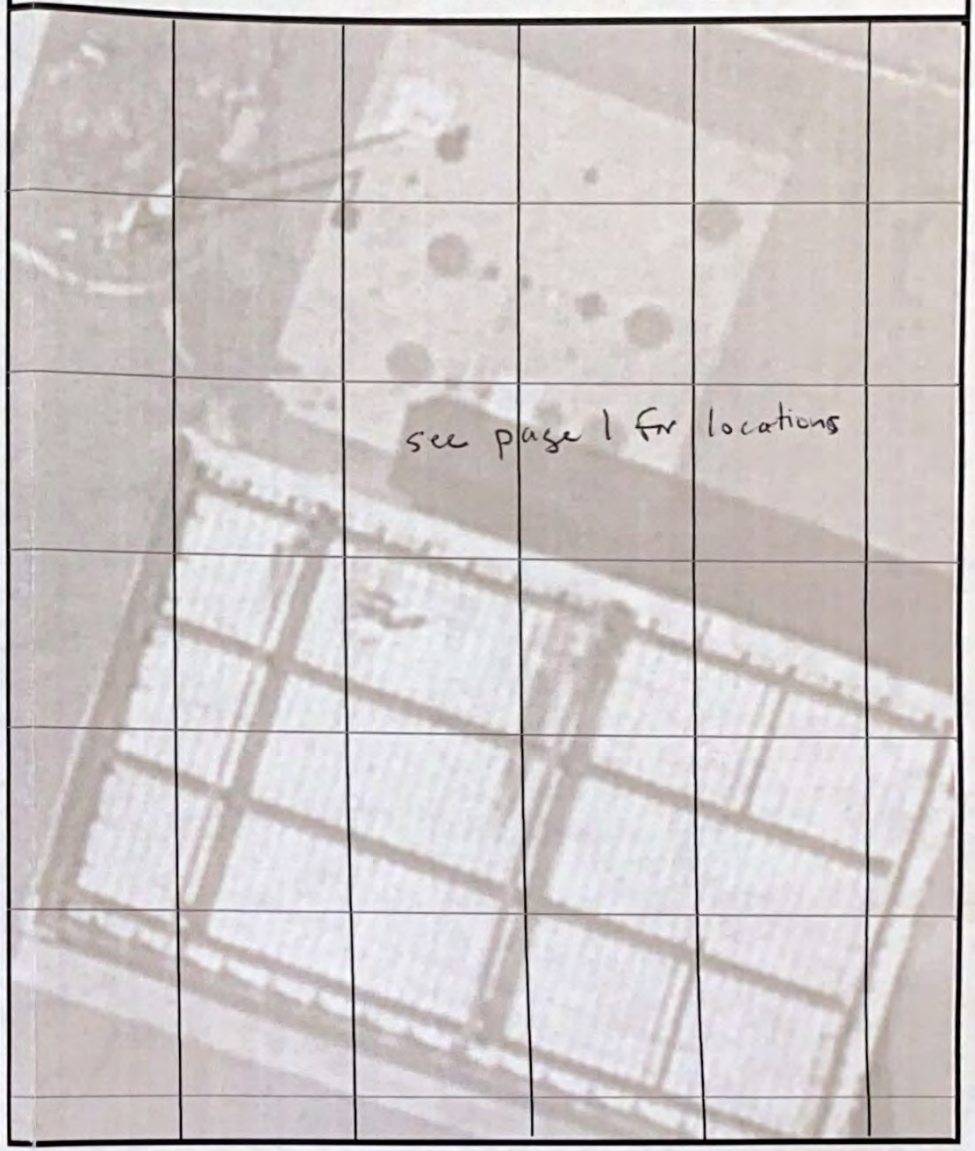


Table 2

Sample Collection Detail
Phase II Investigation
3942 Woodland Ave., Duluth, Minnesota

Sample Location Number	RECs Being Eval-uated	Sample location description	Depth	Soil Analytes			Soil Gas Analytes
				GRO	DRO	BTEX	VOCs
B-1	1 and 2	At each end of diesel tank	1 foot below the floor of the excavation – 14 feet bgs		1	1	
B-2	1 and 2		1 foot below the floor of the excavation – 14 feet bgs		1	1	
B-3	1 and 2	At each end of gasoline tank	1 foot below the floor of the excavation – 14 feet bgs	1		1	
B-4	1 and 2		1 foot below the floor of the excavation – 14 feet bgs	1		1	
B-5	1 and 2	At each end of gasoline tank	1 foot below the floor of the excavation – 14 feet bgs	1		1	
B-6	1 and 2		1 foot below the floor of the excavation – 14 feet bgs	1		1	
B-7	1 and 2	Below dispenser	3.5 feet below dispenser – 6 feet bgs	1	1	1	
B-8	1 and 2	Below dispenser	3.5 feet below dispenser – 6 feet bgs	1	1	1	
B-9	1 and 2	Below dispenser	4 feet below dispenser – 6 feet bgs	1	1	1	
B-10	1 and 2	Below dispenser	5 feet below dispenser – 7.5 feet bgs	1	1	1	
B-11	1 and 2	Below dispenser	5 feet below dispenser – 7.5 feet bgs	1	1	1	
SS-1	1 and 2	Inside convenience building	7 inches bgs				1
SS-2	1 and 2	South end of Parking lot	8 inches bgs				1
SS-3	1 and 2	North end of Parking lot	5 inches bgs				1

REC recognized environmental condition
bgs below ground surface
B bottom sample
SS sub slab vapor samples
GRO gasoline range organics
DRO diesel range organics
VOCs volatile organic compounds
BTEX benzene, toluene, ethylbenzene, xylenes

Table 3
Soil Analytical Data Summary
3942 Woodland Ave. Duluth, MN

			Location	B-1	B-2		B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10	B-11
			Date	11/08/2021	11/08/2021		11/08/2021	11/08/2021	11/08/2021	11/08/2021	11/09/2021	11/09/2021	11/09/2021	11/09/2021	11/09/2021
			Depth	14 ft	14 ft	14 ft	14 ft	14 ft	14 ft	14 ft	6 ft	6 ft	6 ft	7.5 ft	7.5 ft
			Sample Type	N	N	FD	N	N	N	N	N	N	N	N	N
Parameter	MPCA Residential/Recreational Chronic Soil Reference Values	MPCA Industrial/Commercial Chronic Soil Reference Values													
Last Updated	05/01/2021	05/01/2021													
Exceedance Key	No Exceedances	No Exceedances													
General Parameters															
Solids, percent			96	98	97	97	96	98	98	89	94	89	95	90	
Volatile Organic Compounds															
Benzene	9.4	42	< 0.23 U	< 0.22 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.30 U	< 0.32 U	< 0.22 U	< 0.25 U	< 0.21 U	< 0.22 U	< 0.22 U	
Ethyl benzene	190	480	< 0.23 U	< 0.22 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.30 U	< 0.32 U	< 0.22 U	< 0.25 U	< 0.21 U	< 0.22 U	< 0.22 U	
Toluene	820	820	< 0.23 U	< 0.22 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.30 U	< 0.32 U	< 0.22 U	< 0.25 U	< 0.21 U	< 0.22 U	< 0.22 U	
Xylene, m & p	260 XYL	260 XYL	< 0.46 U	< 0.44 U	< 0.48 U	< 0.47 U	< 0.48 U	< 0.60 U	< 0.65 U	< 0.45 U	< 0.49 U	< 0.43 U	< 0.45 U	< 0.44 U	
Xylene, o	260 XYL	260 XYL	< 0.23 U	< 0.22 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.30 U	< 0.32 U	< 0.22 U	< 0.25 U	< 0.21 U	< 0.22 U	< 0.22 U	
Xylene, total (Barr Calculation)	260 XYL	260 XYL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Total Petroleum Hydrocarbons															
Gasoline Range Organics, C6-C10			--	--	--	< 5.9 U	< 6.2 U	< 5.1 U	< 7.1 U	< 5.6 U	< 5.3 U	< 5.2 U	< 5.7 U	< 5.6 U	
Diesel Range Organics, C10-C28			6.0	< 2.9 U	< 3.5 U	--	--	--	--	< 3.5 U	< 4.8 U	5.2	< 6.2 U	8.1	

Note:
All values in mg/kg unless otherwise noted

Table 4
Sub-slab Vapor Analytical Data Summary
3942 Woodland Ave. Duluth, MN

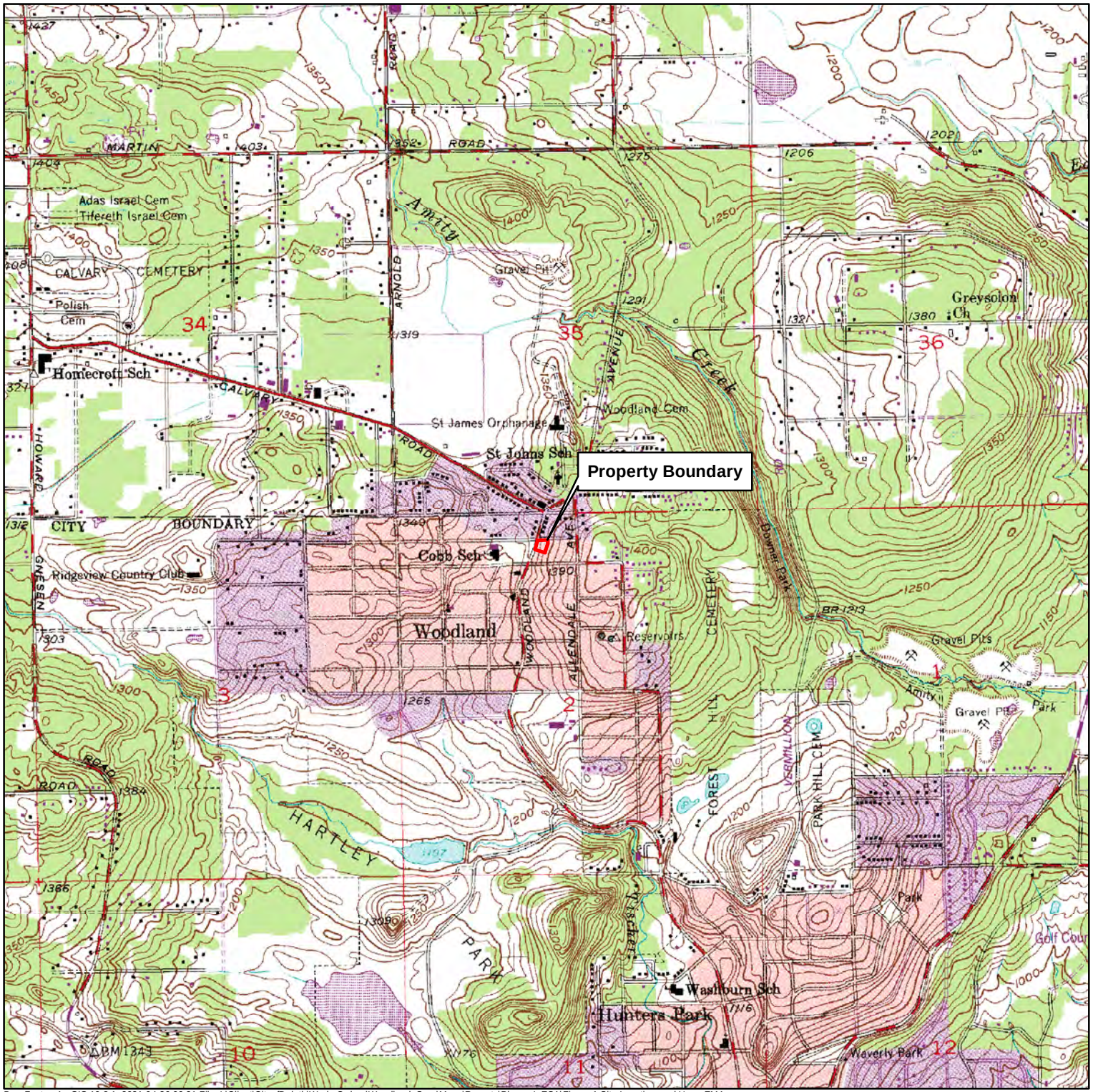
					Location	**SS-1**	**SS-2**	**SS-3**
					Date	**10/11/2021**	**10/11/2021**	**10/11/2021**
Parameter	MPCA Commercial/Industrial Intrusion Screening Values (ISVs) for Vapor Intrusion Risk Evaluation	MPCA Commercial/Industrial 33X Intrusion Screening Values (ISVs) for Vapor Intrusion Risk Evaluation	MPCA Residential Intrusion Screening Values (ISVs) for Vapor Intrusion Risk Evaluation	MPCA Residential 33X Intrusion Screening Values (ISVs) for Vapor Intrusion Risk Evaluation				
Last Updated	01/01/2021	01/01/2021	01/01/2021	01/01/2021				
Exceedance Key	**Bold**	No Exceedances	Underline	Shade				
Field Parameters								
PID measurement (ppm)						0	0	0
Total Petroleum Hydrocarbons								
1,1,1-Trichloroethane	18000	600000	5200	170000		< 2.7 U	< 2.7 U	6.1
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA		< 3.4 U	< 3.4 U	< 3.4 U
1,1,2-Trichloroethane	0.70	23	0.21	7.0		< 2.7 U	< 2.7 U	< 2.7 U
1,1-Dichloroethane	NA	NA	NA	NA		< 2.0 U	< 2.0 U	< 2.0 U
1,1-Dichloroethylene	700	23000	210	7000		< 2.0 U	< 2.0 U	< 2.0 U
1,2,4-Trichlorobenzene	7.0	230	2.1	70		< 3.7 U	< 3.7 U	< 3.7 U
1,2,4-Trimethylbenzene	210	7000	63	2100		1.3	11	13
1,2-Dibromoethane (EDB)	0.16	5.3	0.017	0.57		< 3.8 U	< 3.8 U	< 3.8 U
1,2-Dichlorobenzene	NA	NA	NA	NA		< 3.0 U	< 3.0 U	< 3.0 U
1,2-Dichloroethane	3.8	130	0.39	13		< 2.0 U	< 2.0 U	< 2.0 U
1,2-Dichloroethylene, cis	NA	NA	NA	NA		< 2.0 U	< 2.0 U	< 2.0 U
1,2-Dichloroethylene, trans	70	2300	21	700		< 2.0 U	< 2.0 U	< 2.0 U
1,2-Dichloropropane	14	470	2.7	90		< 2.3 U	< 2.3 U	< 2.3 U
1,3,5-Trimethylbenzene	210	7000	63	2100		< 0.98 U	3.4	5.3
1,3-Butadiene	**2.7**	90	0.28	9.3		< 1.1 U	**31**	2.5
1,3-Dichlorobenzene	NA	NA	NA	NA		< 3.0 U	< 3.0 U	< 3.0 U
1,3-Dichloropropene, cis	25 (2)	830 (2)	2.5 (2)	83 (2)		< 2.3 U	< 2.3 U	< 2.3 U
1,3-Dichloropropene, trans	25 (2)	830 (2)	2.5 (2)	83 (2)		< 2.3 U	< 2.3 U	< 2.3 U
1,4-Dichlorobenzene	210	7000	63	2100		< 3.0 U	< 3.0 U	< 3.0 U
1-Heptene						--	--	36 J TIC
2,3,4-Trimethylpentane						--	48 J TIC	--
2,4-Dimethylhexane						--	49 J TIC	36 J TIC
2-Butanone, 3-methyl-						--	33 J TIC	--
2-Hexanone	110	3700	31	1000		< 2.0 U	4.1	10
2-Methylheptane						--	46 J TIC	30 J TIC
2-Pentanone						--	--	63 J TIC
3-ethyl-2methylheptane						--	95 J TIC	--
4-Ethyltoluene	NA	NA	NA	NA		< 2.5 U	< 2.5 U	3.2
4-Methyldecane						--	130 J TIC	--
Acetaldehyde						--	--	19 J TIC
Acetone	110000	3700000	32000	1100000		87	260	140
Benzene	**11**	370	1.3	43		< 0.64 U	**23**	**11**
Benzyl chloride	2.0	67	0.21	7.0		< 2.6 U	< 2.6 U	< 2.6 U
Bromodichloromethane	70 (1)	2300 (1)	21 (1)	700 (1)		< 3.4 U	< 3.4 U	< 3.4 U
Bromoform	NA	NA	NA	NA		< 5.2 U	< 5.2 U	< 5.2 U
Bromomethane	14	470	4.2	140		< 1.9 U	< 1.9 U	< 1.9 U
Butane (C4)						57 J TIC	--	--
Carbon disulfide	2800	93000	830	28000		< 1.6 U	3.6	< 1.6 U
Carbon tetrachloride	16	530	1.7	57		< 3.1 U	< 3.1 U	< 3.1 U
Chlorobenzene	180	6000	52	1700		< 2.3 U	< 2.3 U	< 2.3 U
Chlorodibromomethane	NA	NA	NA	NA		< 4.3 U	< 4.3 U	< 4.3 U
Chloroethane	14000 (1)	470000 (1)	4200 (1)	140000 (1)		< 1.3 U	5.1	3.2
Chloroform	350	12000	100	3300		< 2.4 U	< 2.4 U	< 2.4 U
Chloromethane	320	11000	94	3100		< 1.0 U	< 1.0 U	< 1.0 U
Cyclohexane	21000	700000	6300	210000		< 1.7 U	20	15
Cyclopentanone, 2-methyl-						--	--	26 J TIC
Decane						31 J TIC	230 J TIC	58 J TIC
Dichlorodifluoromethane (Freon-12)	NA	NA	NA	NA		5100	17	4.9
Dichlorotetrafluoroethane						< 3.5 U	< 3.5 U	< 3.5 U
Dodecane						130 J TIC	100 J TIC	140 J TIC
Ethyl acetate	250	8300	73	2400		< 1.8 U	< 1.8 U	< 1.8 U
Ethyl alcohol	NA	NA	NA	NA		150	< 0.94 U	< 0.94 U
Ethyl benzene	39	1300	4.1	140		5.0	6.1	13
Heptane	1400	47000	420	14000		< 2.0 U	22	21
Hexachlorobutadiene	NA	NA	NA	NA		< 5.3 U	< 5.3 U	< 5.3 U
Hexane (C6)	2500	83000	730	24000		3.4	22	20
Isopropyl alcohol	700	23000	210	7000		31	8.3	11

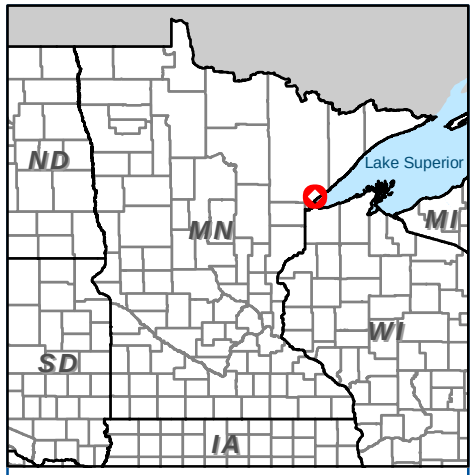
Table 4
Sub-slab Vapor Analytical Data Summary
3942 Woodland Ave. Duluth, MN

					Location	**SS-1**	**SS-2**	**SS-3**
					Date	**10/11/2021**	**10/11/2021**	**10/11/2021**
Parameter	MPCA Commercial/Industrial Intrusion Screening Values (ISVs) for Vapor Intrusion Risk Evaluation	MPCA Commercial/Industrial 33X Intrusion Screening Values (ISVs) for Vapor Intrusion Risk Evaluation	MPCA Residential Intrusion Screening Values (ISVs) for Vapor Intrusion Risk Evaluation	MPCA Residential 33X Intrusion Screening Values (ISVs) for Vapor Intrusion Risk Evaluation				
Last Updated	01/01/2021	01/01/2021	01/01/2021	01/01/2021				
Exceedance Key	**Bold**	No Exceedances	Underline	Shade				
Methyl ethyl ketone (2-butanone)	11000	370000	3100	100000		7.8	45	35
Methyl isobutyl ketone (MIBK)	11000	370000	3100	100000		< 2.0 U	< 2.0 U	3.6
Methyl tertiary butyl ether (MTBE)	380	13000	39	1300		< 1.8 U	< 1.8 U	< 1.8 U
Methylene chloride	2100	70000	630	21000		9.2	< 1.7 U	< 1.7 U
Naphthalene	32	1100	9.4	310		< 2.6 U	18	4.2
n-Butyl alcohol						17 J TIC	--	--
Nonane						--	70 J TIC	--
Propane (C3)						43 J TIC	--	--
Propylene	11000	370000	3100	100000		< 0.86 U	170	< 0.86 U
Styrene	3200	110000	940	31000		< 2.1 U	3.3	< 2.1 U
Tetrachloroethylene	33	1100	3.4	110		< 3.4 U	< 3.4 U	< 3.4 U
Tetrahydrofuran	7000	230000	2100	70000		8.4	< 1.5 U	11
Toluene	14000	470000	4200	140000		1.8	28	29
Trichloroethylene (TCE)	7.0 (3)	230 (3)	2.1 (3)	70 (3)		< 1.1 U	< 1.1 U	< 1.1 U
Trichlorofluoromethane (Freon-11)	3500 (1)	120000 (1)	1000 (1)	33000 (1)		5.4	< 2.8 U	< 2.8 U
Trichlorotrifluoroethane (Freon 113)	18000	600000	5200	170000		< 3.8 U	< 3.8 U	< 3.8 U
Tridecane						81 J TIC	--	--
Trimethyl silanol						43 J TIC	--	42 J TIC
Undecane						--	110 J TIC	110 J TIC
Vinyl acetate	700	23000	210	7000		< 1.8 U	< 1.8 U	< 1.8 U
Vinyl chloride	22 (4)	730 (4)	1.7 (4)	57 (4)		< 0.51 U	< 0.51 U	< 0.51 U
Xylene, m & p	350 (5)	12000 (5)	100 (5)	3300 (5)		19	12	39
Xylene, o	350 (5)	12000 (5)	100 (5)	3300 (5)		5.3	7.0	17
Xylene, total (Barr Calculation)	350 (5)	12000 (5)	100 (5)	3300 (5)		24	19	56

Notes:
All value in ug/m3 unless otherwise noted

Figures





Property Boundary

N

0 2,000 4,000

Feet

1 Inch = 2,000 Feet

SITE LOCATION
Phase II Investigation
3942 Woodland Ave.
City of Duluth, MN

FIGURE 1

Barr Footer: ArcGIS 10.8.1, 2021-04-26 09:21 File: I:\Client\CityofDuluth\Work_Orders\Woodland_Spur\Maps\Reports\Phase_I_ESA\Figure 1 Site Location.mxd User: EMA

REC #1: Historical Site Use, Petroleum Underground Storage Tanks, and Fuel Pump Infrastructure
REC #2: Adjoining Site with Regulatory Listing
Finding #1: Historical Residential Structures
Finding #2: Adjoining and Surrounding Sites with Regulatory Listing
Finding #3: Floor Drain
Finding #4: Pole Mounted Transformer

#2 - Murphy Oil USA #9804
#2 Woodland Short Stop
#4
REC #2 - KJ Auto Services Inc
Gasoline Tanks 006 and 007
Diesel Tank 008
UST Vent Pipes
Monitoring Well B-6
Monitoring Well B-4
Monitoring Well B-5
Monitoring Well
SS-3
Monitoring well
B-2
REC #1 - Historical Site Use/ Underground Storage Tanks
B-3
B-1
B-7
B-9
B-8
B-11
#3
SS-1
Convenience Building
B-10
#1 Historical Residential Structures
SS-2
Canopy and Historical Fueling Pumps (Removed)
W Redwing St
E Redwing St
Woodland Ave

Property Boundary
Parcel Boundary
Building
Excavation Area
Island Pump Dispensers
Underground Storage Tanks
Phase I Finding
Phase I REC
Other Observation Point

Sample Locations
Soil Sample Location (B-#)
Sub-Slab Sample Location (SS-#)

N

0 25 50
Feet

Imagery - Nearmap, May 2020

SAMPLING LOCATIONS
Phase II Investigation
3942 Woodland Ave.
City of Duluth, MN

FIGURE 2

BARR

Barr Footer: ArcGIS 10.8.1, 2021-11-12 14:48 File: I:\Client\CityofDuluth\Work_Orders\Woodland_SpotMaps\Reports\Phase_I_ESA\Figure 2 Sampling Locations.mxd User: vaw

Appendices

Appendix A

MPCA Site Closure Letter

MPCA ID: LS0009661
March 9, 1999

Minnesota Pollution Control Agency

March 9, 1999

Mr C L Russell
Murphy Oil USA Incorporated
200 Peach Street
P O Box 7000
El Dorado, Arkansas 71731-7000

RE Petroleum Tank Release Site File Closure
Site Woodland Spur Station #3129, 3942 Woodland Avenue, Duluth
Site ID# LEAK00009661

Dear Mr Russell

We are pleased to let you know that the Minnesota Pollution Control Agency (MPCA) Duluth Area Office, Remediation Unit (RU) staff has determined that your investigation and/or cleanup has adequately addressed the petroleum tank release at the site listed above Based on the information provided, the RU staff has closed the release site file

Closure of the file means that the RU staff does not require any additional investigation and/or cleanup work at this time or in the foreseeable future Please be aware that file closure does not necessarily mean that all petroleum contamination has been removed from this site However, the RU staff has concluded that any remaining contamination, if present, does not appear to pose a threat to public health or the environment

The MPCA reserves the right to reopen this file and to require additional investigation and/or cleanup work if new information or changing regulatory requirements make additional work necessary If you or other parties discover additional contamination (either petroleum or nonpetroleum) that was not previously reported to the MPCA, Minnesota law requires that the MPCA be immediately notified

You should understand that this letter does not release any party from liability for the petroleum contamination under Minn Stat ch 115C (Supp 1997) or any other applicable state or federal law In addition, this letter does not release any party from liability for nonpetroleum contamination, if present, under Minn Stat ch 115B (1996), the Minnesota Superfund Law

Because you performed the requested work, the state may reimburse you for a major portion of your costs The Petroleum Tank Release Cleanup Act establishes a fund which may provide partial reimbursement for petroleum tank release cleanup costs This fund is administered by the Department of Commerce Petro Board Specific eligibility rules are available from the Petro Board at 612/297-1119 or 612/297-4203

Dulu rnment Center, Suite 704, 320 West Second St , Duluth, Minnesota 55802, (218) 723-4660, FAX (218) 723-4727
Central Office St Paul Regional Offices Duluth • Brainerd • Detroit Lakes • Marshall • Rochester
Telephone Device for the Deaf (TDD) (800) 627-3529

If future development of this property or the surrounding area is planned, it should be assumed that petroleum contamination may still be present If petroleum contamination is encountered during future development work, the MPCA staff should be notified immediately

For specific information regarding petroleum contamination that may remain at this leak site, please call the RU File Request Program at 612/297-8499 The MPCA fact sheet #3 35 *Leak/Spill and Underground Storage Tank File Request Form* must be completed prior to arranging a time for file review

Thank you for your response to this petroleum tank release and for your cooperation with the MPCA to protect public health and the environment. If you have any questions regarding this letter, please call me at 218/723-4897

Sincerely,

Steven J Leppala
Project Manager

cc Jeffrey Cox, City Clerk, Duluth
Duane Flynn, Fire Chief, Duluth
Ted Troolin, St. Louis County Solid Waste Officer
Richard Brude, DPRA Environmental
Minnesota Department of Commerce Petrofund Staff

Appendix B

Representative Photographs

Appendix B
Representative Photographs
Phase II Investigation
3942 Woodland Ave.
Duluth, Minnesota

October 11 and November 1-5, and 8-11, 2021

Photograph #	Description
1	Location of sub-slab vapor point SS-1 in convenience building. Photo facing west on 10/11/2021.
2	Location of sub-slab vapor point SS-2. Photo facing northeast on 10/11/2021.
3	Location of sub-slab vapor point SS-3. Photo facing south on 10/11/2021.
4	Monitoring well cover rusted and cemented in place. Photo taken on 10/11/2021.
5	Canopy removal activities. Photo facing south on 11/01/2021.
6	UST excavation activites. Photo facing southeast on 11/05/2021.
7	UST removal. Photo facing southeast on 10/08/2021.
8	USTs removed from excavation. Photo facing east on 11/08/2021.
9	Dispenser removal activities. Photo facing northeast on 11/09/2021.
10	Dispenerser removed. Photo facing southeast on 11/09/2021.
11	Excavation backfilled. Photo facing southeast on 11/11/2021.
12	Excavation backfilled. Photo facing southeast on 11/11/2021.

Photo 1:

Photo 2:

Photo 1: Location of sub-slab vapor point SS-1 in convenience building. Photo facing west on 10/11/2021.

Photo 2: Location of sub-slab vapor point SS-2. Photo facing northeast on 10/11/2021.

Photo 3:

Photo 4:

Photo 3: Location of sub-slab vapor point SS-3. Photo facing south on 10/11/2021.

Photo 4: Monitoring well cover rusted and cemented in place. Photo taken on 10/11/2021.

Photo 5:

Photo 6:

Photo 5: Canopy removal activities. Photo facing south on 11/01/2021.

Photo 6: UST excavation activites. Photo facing southeast on 11/05/2021.

Photo 7:

Photo 8:

Photo 7: UST removal. Photo facing southeast on 10/08/2021.

Photo 8: USTs removed from excavation. Photo facing east on 11/08/2021.

Photo 9:

Photo 10

Photo 9: Dispenser removal activities. Photo facing northeast on 11/09/2021.

Photo 10: Dispenerser removed. Photo facing southeast on 11/09/2021.

Photo 11:

Photo 12:

Photo 11: Excavation backfilled. Photo facing southeast on 11/11/2021.

Photo 12: Excavation backfilled. Photo facing southeast on 11/11/2021.

Appendix C

MPCA Notification Forms

MINNESOTA POLLUTION CONTROL AGENCY

520 Lafayette Road North
St. Paul, MN 55155-4194

UST ten-day advance notice

Underground Storage Tanks (UST) Program
Installation, closure, lining inspection, tanks, piping, dispensers

Doc Type: Advance Notices

Notify the Minnesota Pollution Control Agency (MPCA) **at least ten days prior** to start of activity. Keep a copy for your records.

Use this form for:

- Installation or replacement of tank, piping, or dispensers
- Change to storage of nonregulated substance
- Permanent tank closure
- Inspection of internal lining

Submittal: To submit this form, save the form to your computer and send to the MPCA by using the submit button at the end of the form, or attach the form to an email message, using "Ten-day notice" as the subject line to undergroundtanks.pca@state.mn.us.
All questions with an asterisk(*) are required fields.

Person giving notice

Name: Kevin J Lund Phone: (218) 343-3312 *Start date: 10/04/2021
If date changes by more than 48 hours, you must re-notify.

Site information

*Site name: Former Spur Station #3129 Site # (if known): TS0005013
*Address: 3942 Woodland Avenue
*City: Duluth State: MN Zip code: 55803 County: St. Louis

Owner information

*Name: St Louis County
*Address: 320 West 2nd Street
*City: Duluth State: MN Zip code: 55802
*Contact name: Christopher Johnson *Phone:

Action

Tank #	006	007	007-2	008	008-2	
Substance	E10 Gas	E10 Gas	E10 Gas	Diesel	Diesel	
Capacity	12,000	5,000	5,000	5,000	5,000	
Tank type	DW Steel	DW Steel	DW Steel	DW Steel	DW Steel	
Piping type	DW Flex	DW Flex	DW Flex	DW Flex	DW Flex	
Double-walled? Is all new equipment secondarily contained? (tank, piping, dispensers, submersible pump)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Install new tank	☐	☐	☐	☐	☐	☐
Install new piping	☐	☐	☐	☐	☐	☐
Install new tank and piping	☐	☐	☐	☐	☐	☐
Install new dispenser(s) (How many:)	☐	☐	☐	☐	☐	☐
Remove tank	☒	☒	☒	☒	☒	☐
Close tank in place	☐	☐	☐	☐	☐	☐
Change to nonregulated substance	☐	☐	☐	☐	☐	☐
Inspect internal lining	☐	☐	☐	☐	☐	☐

Contractor information

*Contractor name: TPEC Certification #: 695
*Supervisor name: Kevin J Lund Certification #: 3444
Comments:

Submit Reset

MINNESOTA POLLUTION CONTROL AGENCY

520 Lafayette Road North
St. Paul, MN 55155-4194

UST notification form

Underground Storage Tanks (UST) Program

Installation, closure, tanks, piping, dispensers

Doc Type. Permitting Registration Form

Notify the Minnesota Pollution Control Agency (MPCA) **within 30 days after** bringing tank system into use. Keep a copy for your records. **Incomplete forms will be returned. Guidance on pages 5-6.**

Use this form for:

- Installation or replacement of tank, piping, or dispensers
- Removals or permanent closures

Submittal: To submit this form, save it to your computer and send to the MPCA, using the submit button at the end of the form; or attach it to an email message, using "Notification form" as the subject line to undergroundtanks.pca@state.mn.us. Ensure all necessary signatures are acquired. Email the completed document to those who need to sign and certify it. Complete the Site assessor/sampler section for permanent closures, removals, or product change to a non-regulated substance. All questions with an asterisk(*) are required fields.

Site information

*Site name: Spur Station #3129

*Address: 3942 Woodland Avenue Site number (if known): TS0005013

*City: Duluth State: MN *Zip code: 55803 *County: St. Louis

*Contact name: *Phone:

*Email address:

Is this site located on Native American lands? ☐ Yes ☒ No Is this the initial notification for this site? ☐ Yes ☐ No

Type of facility: ☐ Service station ☐ Government ☐ Education ☐ Industry/Factory ☐ Auto dealer ☐ Utility ☐ Bulk plant ☐ Resort ☐ Office building ☒ Other (specify): Convenience Store

Owner information

Name: ST OF MN C278 L35 (managed by the St. Louis County Land and Minerals Department)

Address: 320 West 2nd Street

City: Duluth State: MN Zip code: 55802

Contact name: Christopher Johnson Phone: (218) 726-2607

Email address: Johnsonc6@stlouiscountymn.gov

A. Action (Enter date [mm/dd/yyyy] of action under tank number)

1. Tank number *See Guidance – page 5*	006	007/007-2	008/008-2		
2. Install new tank					
3. Install new piping					
4. Install new tank and piping					
5. Install new dispenser					
6. Change tank information					
7. Change piping, pump, or dispenser information					
8. Current tank status *See Guidance – page 5*	Status: Removed Date: 11/08/2021	Status: Removed Date: 11/08/2021	Status: Removed Date: 11/08/2021	Status: Date:	
9. If tank has been removed, list tank sludge disposal company and Hazardous Waste Generator ID#	OSI	OSI	OSI		

B. Tank information

1. Tank number *See Guidance – page 5*	006	007/007-2	008/008-2	
2. Capacity	Gallons: 12,000	Gallons: 10,000	Gallons: 10,000	Gallons:
3. Stored substance *See Guidance – page 5*	Type: Gasoline, E10 *Specify:*	Type: Select from list: *Specify:*	Type: Select from list: *Specify:*	Type Select from list: *Specify:*
4. Compartmental tank only *See Guidance – page 5*				
Compartment 1	Gallons: Type: Select from list: *Specify:*	Gallons: 5,000 Type: Gasoline, E10 *Specify:*	Gallons: 5,000 Type: Diesel, Petroleum *Specify:*	Gallons: Type Select from list: *Specify:*
Compartment 2	Gallons: Type: Select from list: *Specify:*	Gallons: 5,000 Type: Gasoline, E10 *Specify:*	Gallons: 5,000 Type: Diesel, Petroleum *Specify:*	Gallons: Type Select from list: *Specify:*
Compartment 3	Gallons: Type: Select from list: *Specify:*	Gallons: Type: Select from list: *Specify:*	Gallons: Type: Select from list: *Specify:*	Gallons: Type Select from list: *Specify:*
5. Special use	☐ Heating only	☐ Heating only	☐ Heating only	☐ Heating only
6. Tank type *See Guidance – page 5*	Type: STIP3,SingleWalled *Specify:*	Type: STIP3,SingleWalled *Specify:*	Type STIP3,SingleWalled *Specify:*	Type Select from list: *Specify:*
7. Tank manufacturer				
8. Tank model				
9. Tank corrosion protection *See Guidance – page 5*	Sacrificial anode	Sacrificial anode	Sacrificial anode	Select from the list:
10. Spill bucket containment	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	☐ Yes ☐ No
11. Spill bucket manufacturer and model				
12. Spill bucket – single wall or double wall	☐ Single ☐ Double	☐ Single ☐ Double	☐ Single ☐ Double	☐ Single ☐ Double
13. Overfill prevention type *See Guidance – page 5*	Fill pipe flapper valve	Fill pipe flapper valve	Fill pipe flapper valve	Select form list:
14. Overfill equipment manufacturer and model				
15. Stage 1 vapor recovery for gasoline tanks	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
16. Stage 1 vapor recovery	☐ 2 point ☐ Coax	☐ 2 point ☐ Coax	☐ 2 point ☐ Coax	☐ 2 point ☐ Coax
17. Primary method of tank release detection *See Guidance – page 5*	Auto tank gauging (ATG)	Auto tank gauging (ATG)	Auto tank gauging (ATG)	Select from list:
18. Automatic tank gauge manufacturer and model				
19. Automatic tank gauge probe model				
20. Tank interstitial sensor manufacturer and model				

C. Piping, pump, and dispenser information:

1. Tank number *See Guidance – page 5*	006	007/007-2	008/008-2	
2. Piping type *See Guidance – page 5*	Type: FlexNonmetallic,Dblwall *Specify:*	Type: FlexNonmetallic,Dblwall *Specify:*	Type: FlexNonmetallic,Dblwall *Specify:*	Type: Select from list: *Specify:*
3. Piping manufacturer and model				
4. Pipe sealant/adhesive manufacturer and model				
5. Flexible connector manufacturer and model				
6. Shear valve manufacturer and model				
7. Shear valve dual pop-it	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
8. Piping corrosion protection *See Guidance – page 6*	Not needed	Not needed	Not needed	Select form list:
9. Primary method of piping release detection *See Guidance – page 6*	Interstitial monitoring	Interstitial monitoring	Interstitial monitoring	Select from list:
10. Line leak detector manufacturer & model				
11. Piping interstitial sensor manufacturer & model				
12. Dispensing type *See Guidance – page 6*	Submersible pump	Submersible pump	Submersible pump	Select from list:
13. Submersible pump containment *See Guidance – page 6*	Type: Synthetic *Specify:*	Type: Synthetic *Specify:*	Type: Synthetic *Specify:*	Type: Select from list: *Specify:*
14. STP containment manufacturer and model				
15. Submersible turbine pump manufacturer and model				
16. Suction pump manufacturer and model				
17. Dispenser manufacturer and model				
18. Dispenser containment *See Guidance – page 6*	Type: Synthetic *Specify:*	Type: Synthetic *Specify:*	Type: Synthetic *Specify:*	Type: Select from list: *Specify:*
19. Break-away manufacturer and model				
20. Swivel manufacturer and model				
21. Nozzle manufacturer and model				
22. Hose manufacturer and model				

Comments:

Certification

Complete the following steps to complete the certification:

1. The Tank supervisor and contractor should complete the applicable section below, save the form, and forward on to Owner to certify.
2. Complete the Site assessor/sampler section if applicable. Save the form and forward to the Site assessor to complete their section if needed.
3. Once the Contractor and Supervisor have certified the document and the Site assessor/sampler information is completed (if required), the Owner should complete the applicable section and click the submit button. The signatures are needed for the form to be accepted.

Tank contractor

I certify that all work was performed as specified by the manufacturer's instructions; that all work was performed according to the applicable codes of practice in Minn. R. ch. 7150.0205; that all work was performed according to applicable state and federal regulations, including this chapter; and that I am in compliance with contractor certification requirements imposed by Minn. R. ch. 7105.

By typing my name below, I certify the above statements to be true and correct, to the best of my knowledge, and that this information can be used for the purpose of processing this form.

☒ I agree

Licensed tank supervisor on site during tank work:

Name: Kevin J Lund
(This document has been electronically signed.)

Title: President

Date (mm/dd/yyyy): 11-29-2021

MPCA supervisor #: 3444

☒ I agree

Licensed tank contractor or authorized representative:

Name: TPEC
(This document has been electronically signed.)

Title: Licensed Contractor

Date (mm/dd/yyyy): 11-29-2021

MPCA contractor #: 695

Site assessor/sampler *(if applicable)*

Minn. R. 7150.0420 requires a site assessment be conducted at the removal or closure in place of regulated USTs or if the product stored is changed from a regulated to non-regulated substance. Please complete the following information to identify who conducted the site assessment. Contamination must be reported. ***State Duty Officer: 1-800-422-0798*** *or* ***651-649-5451.***

Name: Kaitlin Montz Title: Geologist

Date (mm/dd/yyyy): 11/30/2021

Company name: Barr Engineering Co.

Mailing address: 325 S. Lake Ave, Suite 700

City: Duluth State: MN Zip code: 55802

Contact name: Ryan Erickson Email address: rerickson@barr.com

Tank owner

I certify that the information submitted is accurate and complete to the best of my knowledge; that installation of tanks, piping, and dispensers is according to Minn. R. ch. 7150.0100 and 7150.0205, including secondary containment of new and replacement tanks, piping, and dispensers; and that all tanks and piping have release detection according to Minn. R. ch. 7150. 0300 to 7150.0340. I advise that the information submitted is accurate and complete to the best of my knowledge; that the permanent closure of tank systems and change in status to storage of non-regulated substances is according to Minn. R. ch. 7150.0410 (for owners purchasing tanks after March 1, 2009, only). I certify that all tank operators, including lessees, have read this chapter and have sufficient knowledge in the operation and maintenance of underground storage tank systems.

By typing my name below, I certify the above statements to be true and correct, to the best of my knowledge, and that this information can be used for the purpose of processing this form.

☐ I agree

Owner or authorized representative

Name: Christopher A. Johnson
(This document has been electronically signed.)

Title: Property Manager

Date (mm/dd/yyyy): December 1st, 2021

Submit Reset

Appendix D

Quality Assurance/Quality Control Review of Analytical Results

Appendix D
Quality Assurance/Quality Control Review of Analytical Results
Phase II Investigation
3942 Woodland Ave.
Duluth, Minnesota

A review of the quality control data was conducted to assess the validity of the analytical results for the soil and air (soil vapor) samples collected October 11 and November 8 and 9, 2021 at the property at 3942 Woodland Ave. located in Duluth, Minnesota (Property). This review was performed in accordance with the EPA approved QAPP (Barr, 2020; Barr, 2021b) for the City of Duluth grant BF-00E02719 and with Barr's SOPs for data evaluation. As defined in the QAPP, the laboratory analyses were performed by Legend Technical Services (Legend) located in St Paul, Minnesota. Laboratory methodology and reporting limits were updated in the project SAP (Barr, 2021c). This data evaluation discusses sample data contained within Legend work orders 2104671 (air/soil vapor) and 2105216 (soil).

Both field sampling and laboratory analytical procedures were examined in the review of the sampling event. Field sampling procedures were examined utilizing trip and field blank samples, and field (masked) duplicate sample analyses. Laboratory procedures were evaluated utilizing technical holding times, preservation, method blank samples, accuracy data, precision data, and data package completeness.

Field Sampling Procedures

One trip blank sample (soil) and one field blank sample (soil) were collected during this sampling event. No target compounds were detected above the reporting limits (RLs) in both the soil trip and field blank samples.

Field (masked) duplicate sample results were evaluated by calculating the Relative Percent Difference (RPD) values for compounds where both the native and field duplicate sample had concentrations reported above the laboratory reporting limit (RL). The RPD formula is as follows:

$$RPD = \frac{|S - D|}{(S + D)/2} \times 100$$

Where: RPD = relative percent difference

S = original sample result

D = duplicate sample result

One soil sample (B-2_14-14 ft) served as the field duplicate sample during this sampling event. The acceptance criteria used for the field duplicate samples data precision (40% soil RPD) was based on Barr's SOPs for routine data evaluation as defined in the QAPP (Barr, 2020). The field duplicate data met the RPD criteria for precision.

Laboratory Procedures

Technical holding times and preservation were evaluated for each sample and target parameter based on United States Environmental Protection Agency (USEPA) and method recommendations as defined in the QAPP (Barr, 2020). The technical holding times were within these recommendations for all of the soil and air (soil vapor) analyses, except that percent solid determinations for the soil samples were completed outside the recommended hold time of seven days. The percent solid results are used for moisture corrections in the final data calculations, so the data was not qualified. The soil samples arrived at the laboratory at temperatures $\leq$ 6°C, and with the correct chemical preservatives.

Method blanks were analyzed by the laboratory for each parameter. No target compounds were detected above the RL in the method blank samples. TO-15 reporting included Tentatively Identified Compounds (TICs), and TIC blanks had no analyte detections above 5.0 parts per billion by volume (ppbv).

The accuracy and precision data review included evaluation of laboratory control spike (LCS), laboratory control spike duplicate (LCSD), matrix spike (MS), matrix spike duplicate (MSD), surrogate standards and laboratory duplicate samples. Accuracy was evaluated by comparing laboratory percent recoveries from LCS, LCSD, MS, and MSD samples, and surrogate standards to laboratory acceptance criteria. Precision was evaluated by calculating the RPD of the LCS/LCSD, MS/MSD and the laboratory duplicate sample pair.

The LCS and LCSD samples displayed acceptable accuracy and precision when compared to the laboratory acceptance criteria.

MS and MSD soil samples consisted of native (project) samples. MS/MSDs displayed accuracy and/or precision within laboratory acceptance criteria.

Surrogate standard recoveries were evaluated by comparing the percent recoveries to laboratory acceptance criteria. The reported surrogate standard recoveries met laboratory acceptance criteria. Surrogate standard recoveries were not included in the TO-15 air (soil vapor) analysis reporting.

The laboratory duplicate sample data displayed acceptable precision when compared to the laboratory acceptance criteria.

Data completeness was evaluated by comparing the analyses requested with the data package as received. The samples were analyzed in accordance with the chain-of-custody.

Conclusion

The data are deemed acceptable for the purposes of this project with the qualification assigned during the data evaluation process.

Appendix E

Laboratory Analytical Reports (Soil and Soil Vapor)

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

November 08, 2021

Mr. James E. Taraldsen
Barr Engineering Co.
325 South Lake Avenue, Suite 700
Duluth, MN 55802

Work Order Number: 2104671
RE: 23692468

Enclosed are the results of analyses for samples received by the laboratory on 10/12/21. If you have any questions concerning this report, please feel free to contact me.

Results are not blank corrected unless noted within the report. Additionally, all QC results meet requirements unless noted.

The results in this report apply to the samples as received.

All samples will be retained by Legend Technical Services, Inc., unless consumed in the analysis, at ambient conditions for 30 days from the date of this report and then discarded unless other arrangements are made. All samples were received in acceptable condition unless otherwise noted.

All test results and QC meet requirements of the 2003 NELAC standard.

MDH (NELAP) Accreditation #027-123-295

Prepared by,
LEGEND TECHNICAL SERVICES, INC

Bach Pham
Client Manager II/Department Manager
bpham@legend-group.com

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468		
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #:	2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported:	11/08/21

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS-1	2104671-01	Air	10/11/21 11:18	10/12/21 09:53
SS-2	2104671-02	Air	10/11/21 12:54	10/12/21 09:53
SS-3	2104671-03	Air	10/11/21 13:47	10/12/21 09:53
Canister #00378	2104671-04	Air	06/04/21 00:00	10/12/21 09:53
Canister #00382	2104671-05	Air	06/04/21 00:00	10/12/21 09:53
Canister #00437	2104671-06	Air	08/11/21 00:00	10/12/21 09:53

Shipping Container Information

Default Cooler Temperature (°C):

Received on ice: No
Temperature blank was not present
Received on ice pack: No
Received on melt water: No
Ambient: Yes
Acceptable (IH/ISO only): No
Custody seals: No

Case Narrative:

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SS-1 (2104671-01) Air Sampled: 10/11/21 11:18 Received: 10/12/21 9:53										
1,1,1-Trichloroethane	<2.7	2.7	0.54	ug/m³	1	B1J2038	10/19/21	10/19/21	TO-15	
1,1,2,2-Tetrachloroethane	<3.4	3.4	0.82	ug/m³	1	"	"	"	"	
1,1,2-Trichloroethane	<2.7	2.7	0.65	ug/m³	1	"	"	"	"	
1,1-Dichloroethane	<2.0	2.0	0.29	ug/m³	1	"	"	"	"	
1,1-Dichloroethene	<2.0	2.0	0.34	ug/m³	1	"	"	"	"	
1,2,4-Trichlorobenzene	<3.7	3.7	0.82	ug/m³	1	"	"	"	"	
1,2,4-Trimethylbenzene	**1.3**	0.98	0.24	ug/m³	1	"	"	"	"	
1,2-Dibromoethane	<3.8	3.8	0.53	ug/m³	1	"	"	"	"	
1,2-Dichlorobenzene	<3.0	3.0	0.37	ug/m³	1	"	"	"	"	
1,2-Dichloroethane	<2.0	2.0	0.69	ug/m³	1	"	"	"	"	
1,2-Dichloropropane	<2.3	2.3	0.69	ug/m³	1	"	"	"	"	
1,3,5-Trimethylbenzene	<0.98	0.98	0.27	ug/m³	1	"	"	"	"	
1,3-Butadiene	<1.1	1.1	0.29	ug/m³	1	"	"	"	"	
1,3-Dichlorobenzene	<3.0	3.0	0.44	ug/m³	1	"	"	"	"	
1,4-Dichlorobenzene	<3.0	3.0	0.44	ug/m³	1	"	"	"	"	
2-Butanone	**7.8**	1.5	0.24	ug/m³	1	"	"	"	"	
4-Ethyltoluene	<2.5	2.5	0.49	ug/m³	1	"	"	"	"	
Acetone	**87**	36	7.8	ug/m³	30	"	"	10/21/21	"	
Benzene	<0.64	0.64	0.29	ug/m³	1	"	"	10/19/21	"	
Benzyl chloride	<2.6	2.6	0.62	ug/m³	1	"	"	"	"	
Bromodichloromethane	<3.4	3.4	0.94	ug/m³	1	"	"	"	"	
Bromoform	<5.2	5.2	0.68	ug/m³	1	"	"	"	"	
Bromomethane	<1.9	1.9	0.10	ug/m³	1	"	"	"	"	
Carbon disulfide	<1.6	1.6	0.22	ug/m³	1	"	"	"	"	
Carbon tetrachloride	<3.1	3.1	0.59	ug/m³	1	"	"	"	"	
Chlorobenzene	<2.3	2.3	0.45	ug/m³	1	"	"	"	"	
Chloroethane	<1.3	1.3	0.18	ug/m³	1	"	"	"	"	
Chloroform	<2.4	2.4	0.63	ug/m³	1	"	"	"	"	
Chloromethane	<1.0	1.0	0.17	ug/m³	1	"	"	"	"	
cis-1,2-Dichloroethene	<2.0	2.0	0.27	ug/m³	1	"	"	"	"	
cis-1,3-Dichloropropene	<2.3	2.3	0.82	ug/m³	1	"	"	"	"	
Cyclohexane	<1.7	1.7	0.52	ug/m³	1	"	"	"	"	
Dibromochloromethane	<4.3	4.3	0.82	ug/m³	1	"	"	"	"	
Dichlorodifluoromethane	**5100**	220	17	ug/m³	90	"	"	10/22/21	"	
Dichlorotetrafluoroethane	<3.5	3.5	0.28	ug/m³	1	"	"	10/19/21	"	
Ethanol	**150**	28	7.2	ug/m³	30	"	"	10/21/21	"	
Ethyl acetate	<1.8	1.8	0.40	ug/m³	1	"	"	10/19/21	"	
Ethylbenzene	**5.0**	0.87	0.28	ug/m³	1	"	"	"	"	

LEGEND Technical Services, Inc.

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Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SS-1 (2104671-01) Air Sampled: 10/11/21 11:18 Received: 10/12/21 9:53										
Hexachlorobutadiene	<5.3	5.3	1.4	ug/m³	1	B1J2038	10/19/21	10/19/21	TO-15	
Isopropyl alcohol	**31**	1.2	0.20	ug/m³	1	"	"	"	"	
m,p-Xylene	**19**	1.7	0.48	ug/m³	1	"	"	"	"	
Methyl butyl ketone	<2.0	2.0	0.49	ug/m³	1	"	"	"	"	
Methyl isobutyl ketone	<2.0	2.0	0.41	ug/m³	1	"	"	"	"	
Methyl tert-butyl ether	<1.8	1.8	0.19	ug/m³	1	"	"	"	"	
Methylene chloride	**9.2**	1.7	0.76	ug/m³	1	"	"	"	"	
Naphthalene	<2.6	2.6	0.47	ug/m³	1	"	"	"	"	
n-Heptane	<2.0	2.0	0.39	ug/m³	1	"	"	"	"	
n-Hexane	**3.4**	1.8	0.32	ug/m³	1	"	"	"	"	
o-Xylene	**5.3**	0.87	0.25	ug/m³	1	"	"	"	"	
Propylene	<0.86	0.86	0.13	ug/m³	1	"	"	"	"	
Styrene	<2.1	2.1	0.37	ug/m³	1	"	"	"	"	
Tetrachloroethene	<3.4	3.4	0.59	ug/m³	1	"	"	"	"	
Tetrahydrofuran	**8.4**	1.5	0.56	ug/m³	1	"	"	"	"	
Toluene	**1.8**	0.75	0.28	ug/m³	1	"	"	"	"	
trans-1,2-Dichloroethene	<2.0	2.0	0.38	ug/m³	1	"	"	"	"	
trans-1,3-Dichloropropene	<2.3	2.3	0.54	ug/m³	1	"	"	"	"	
Trichloroethene	<1.1	1.1	0.49	ug/m³	1	"	"	"	"	
Trichlorofluoromethane	**5.4**	2.8	0.20	ug/m³	1	"	"	"	"	
Trichlorotrifluoroethane	<3.8	3.8	0.21	ug/m³	1	"	"	"	"	
Vinyl acetate	<1.8	1.8	0.20	ug/m³	1	"	"	"	"	
Vinyl chloride	<0.51	0.51	0.14	ug/m³	1	"	"	"	"	
SS-2 (2104671-02) Air Sampled: 10/11/21 12:54 Received: 10/12/21 9:53										
1,1,1-Trichloroethane	<2.7	2.7	0.54	ug/m³	1	B1J2038	10/19/21	10/20/21	TO-15	
1,1,2,2-Tetrachloroethane	<3.4	3.4	0.82	ug/m³	1	"	"	"	"	
1,1,2-Trichloroethane	<2.7	2.7	0.65	ug/m³	1	"	"	"	"	
1,1-Dichloroethane	<2.0	2.0	0.29	ug/m³	1	"	"	"	"	
1,1-Dichloroethene	<2.0	2.0	0.34	ug/m³	1	"	"	"	"	
1,2,4-Trichlorobenzene	<3.7	3.7	0.82	ug/m³	1	"	"	"	"	
1,2,4-Trimethylbenzene	**11**	0.98	0.24	ug/m³	1	"	"	"	"	
1,2-Dibromoethane	<3.8	3.8	0.53	ug/m³	1	"	"	"	"	
1,2-Dichlorobenzene	<3.0	3.0	0.37	ug/m³	1	"	"	"	"	
1,2-Dichloroethane	<2.0	2.0	0.69	ug/m³	1	"	"	"	"	
1,2-Dichloropropane	<2.3	2.3	0.69	ug/m³	1	"	"	"	"	
1,3,5-Trimethylbenzene	**3.4**	0.98	0.27	ug/m³	1	"	"	"	"	
1,3-Butadiene	**31**	1.1	0.29	ug/m³	1	"	"	"	"	
1,3-Dichlorobenzene	<3.0	3.0	0.44	ug/m³	1	"	"	"	"	

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
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Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SS-2 (2104671-02) Air Sampled: 10/11/21 12:54 Received: 10/12/21 9:53										
1,4-Dichlorobenzene	<3.0	3.0	0.44	ug/m³	1	B1J2038	10/19/21	10/20/21	TO-15	
2-Butanone	**45**	1.5	0.24	ug/m³	1	"	"	"	"	
4-Ethyltoluene	<2.5	2.5	0.49	ug/m³	1	"	"	"	"	
Acetone	**260**	12	2.6	ug/m³	10	"	"	10/21/21	"	
Benzene	**23**	0.64	0.29	ug/m³	1	"	"	10/20/21	"	
Benzyl chloride	<2.6	2.6	0.62	ug/m³	1	"	"	"	"	
Bromodichloromethane	<3.4	3.4	0.94	ug/m³	1	"	"	"	"	
Bromoform	<5.2	5.2	0.68	ug/m³	1	"	"	"	"	
Bromomethane	<1.9	1.9	0.10	ug/m³	1	"	"	"	"	
Carbon disulfide	**3.6**	1.6	0.22	ug/m³	1	"	"	"	"	
Carbon tetrachloride	<3.1	3.1	0.59	ug/m³	1	"	"	"	"	
Chlorobenzene	<2.3	2.3	0.45	ug/m³	1	"	"	"	"	
Chloroethane	**5.1**	1.3	0.18	ug/m³	1	"	"	"	"	
Chloroform	<2.4	2.4	0.63	ug/m³	1	"	"	"	"	
Chloromethane	<1.0	1.0	0.17	ug/m³	1	"	"	"	"	
cis-1,2-Dichloroethene	<2.0	2.0	0.27	ug/m³	1	"	"	"	"	
cis-1,3-Dichloropropene	<2.3	2.3	0.82	ug/m³	1	"	"	"	"	
Cyclohexane	**20**	1.7	0.52	ug/m³	1	"	"	"	"	
Dibromochloromethane	<4.3	4.3	0.82	ug/m³	1	"	"	"	"	
Dichlorodifluoromethane	**17**	2.5	0.19	ug/m³	1	"	"	"	"	
Dichlorotetrafluoroethane	<3.5	3.5	0.28	ug/m³	1	"	"	"	"	
Ethanol	<0.94	0.94	0.24	ug/m³	1	"	"	"	"	
Ethyl acetate	<1.8	1.8	0.40	ug/m³	1	"	"	"	"	
Ethylbenzene	**6.1**	0.87	0.28	ug/m³	1	"	"	"	"	
Hexachlorobutadiene	<5.3	5.3	1.4	ug/m³	1	"	"	"	"	
Isopropyl alcohol	**8.3**	1.2	0.20	ug/m³	1	"	"	"	"	
m,p-Xylene	**12**	1.7	0.48	ug/m³	1	"	"	"	"	
Methyl butyl ketone	**4.1**	2.0	0.49	ug/m³	1	"	"	"	"	
Methyl isobutyl ketone	<2.0	2.0	0.41	ug/m³	1	"	"	"	"	
Methyl tert-butyl ether	<1.8	1.8	0.19	ug/m³	1	"	"	"	"	
Methylene chloride	<1.7	1.7	0.76	ug/m³	1	"	"	"	"	
Naphthalene	**18**	2.6	0.47	ug/m³	1	"	"	"	"	
n-Heptane	**22**	2.0	0.39	ug/m³	1	"	"	"	"	
n-Hexane	**22**	1.8	0.32	ug/m³	1	"	"	"	"	
o-Xylene	**7.0**	0.87	0.25	ug/m³	1	"	"	"	"	
Propylene	**170**	8.6	1.3	ug/m³	10	"	"	10/21/21	"	
Styrene	**3.3**	2.1	0.37	ug/m³	1	"	"	10/20/21	"	
Tetrachloroethene	<3.4	3.4	0.59	ug/m³	1	"	"	"	"	
Tetrahydrofuran	<1.5	1.5	0.56	ug/m³	1	"	"	"	"	

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SS-2 (2104671-02) Air Sampled: 10/11/21 12:54 Received: 10/12/21 9:53										
Toluene	**28**	0.75	0.28	ug/m³	1	B1J2038	10/19/21	10/20/21	TO-15	
trans-1,2-Dichloroethene	<2.0	2.0	0.38	ug/m³	1	"	"	"	"	
trans-1,3-Dichloropropene	<2.3	2.3	0.54	ug/m³	1	"	"	"	"	
Trichloroethene	<1.1	1.1	0.49	ug/m³	1	"	"	"	"	
Trichlorofluoromethane	<2.8	2.8	0.20	ug/m³	1	"	"	"	"	
Trichlorotrifluoroethane	<3.8	3.8	0.21	ug/m³	1	"	"	"	"	
Vinyl acetate	<1.8	1.8	0.20	ug/m³	1	"	"	"	"	
Vinyl chloride	<0.51	0.51	0.14	ug/m³	1	"	"	"	"	
SS-3 (2104671-03) Air Sampled: 10/11/21 13:47 Received: 10/12/21 9:53										
1,1,1-Trichloroethane	**6.1**	2.7	0.54	ug/m³	1	B1J2038	10/19/21	10/20/21	TO-15	
1,1,2,2-Tetrachloroethane	<3.4	3.4	0.82	ug/m³	1	"	"	"	"	
1,1,2-Trichloroethane	<2.7	2.7	0.65	ug/m³	1	"	"	"	"	
1,1-Dichloroethane	<2.0	2.0	0.29	ug/m³	1	"	"	"	"	
1,1-Dichloroethene	<2.0	2.0	0.34	ug/m³	1	"	"	"	"	
1,2,4-Trichlorobenzene	<3.7	3.7	0.82	ug/m³	1	"	"	"	"	
1,2,4-Trimethylbenzene	**13**	0.98	0.24	ug/m³	1	"	"	"	"	
1,2-Dibromoethane	<3.8	3.8	0.53	ug/m³	1	"	"	"	"	
1,2-Dichlorobenzene	<3.0	3.0	0.37	ug/m³	1	"	"	"	"	
1,2-Dichloroethane	<2.0	2.0	0.69	ug/m³	1	"	"	"	"	
1,2-Dichloropropane	<2.3	2.3	0.69	ug/m³	1	"	"	"	"	
1,3,5-Trimethylbenzene	**5.3**	0.98	0.27	ug/m³	1	"	"	"	"	
1,3-Butadiene	**2.5**	1.1	0.29	ug/m³	1	"	"	"	"	
1,3-Dichlorobenzene	<3.0	3.0	0.44	ug/m³	1	"	"	"	"	
1,4-Dichlorobenzene	<3.0	3.0	0.44	ug/m³	1	"	"	"	"	
2-Butanone	**35**	1.5	0.24	ug/m³	1	"	"	"	"	
4-Ethyltoluene	**3.2**	2.5	0.49	ug/m³	1	"	"	"	"	
Acetone	**140**	12	2.6	ug/m³	10	"	"	10/21/21	"	
Benzene	**11**	0.64	0.29	ug/m³	1	"	"	10/20/21	"	
Benzyl chloride	<2.6	2.6	0.62	ug/m³	1	"	"	"	"	
Bromodichloromethane	<3.4	3.4	0.94	ug/m³	1	"	"	"	"	
Bromoform	<5.2	5.2	0.68	ug/m³	1	"	"	"	"	
Bromomethane	<1.9	1.9	0.10	ug/m³	1	"	"	"	"	
Carbon disulfide	<1.6	1.6	0.22	ug/m³	1	"	"	"	"	
Carbon tetrachloride	<3.1	3.1	0.59	ug/m³	1	"	"	"	"	
Chlorobenzene	<2.3	2.3	0.45	ug/m³	1	"	"	"	"	
Chloroethane	**3.2**	1.3	0.18	ug/m³	1	"	"	"	"	
Chloroform	<2.4	2.4	0.63	ug/m³	1	"	"	"	"	
Chloromethane	<1.0	1.0	0.17	ug/m³	1	"	"	"	"	

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SS-3 (2104671-03) Air Sampled: 10/11/21 13:47 Received: 10/12/21 9:53										
cis-1,2-Dichloroethene	<2.0	2.0	0.27	ug/m³	1	B1J2038	10/19/21	10/20/21	TO-15	
cis-1,3-Dichloropropene	<2.3	2.3	0.82	ug/m³	1	"	"	"	"	
Cyclohexane	**15**	1.7	0.52	ug/m³	1	"	"	"	"	
Dibromochloromethane	<4.3	4.3	0.82	ug/m³	1	"	"	"	"	
Dichlorodifluoromethane	**4.9**	2.5	0.19	ug/m³	1	"	"	"	"	
Dichlorotetrafluoroethane	<3.5	3.5	0.28	ug/m³	1	"	"	"	"	
Ethanol	<0.94	0.94	0.24	ug/m³	1	"	"	"	"	
Ethyl acetate	<1.8	1.8	0.40	ug/m³	1	"	"	"	"	
Ethylbenzene	**13**	0.87	0.28	ug/m³	1	"	"	"	"	
Hexachlorobutadiene	<5.3	5.3	1.4	ug/m³	1	"	"	"	"	
Isopropyl alcohol	**11**	1.2	0.20	ug/m³	1	"	"	"	"	
m,p-Xylene	**39**	1.7	0.48	ug/m³	1	"	"	"	"	
Methyl butyl ketone	**10**	2.0	0.49	ug/m³	1	"	"	"	"	
Methyl isobutyl ketone	**3.6**	2.0	0.41	ug/m³	1	"	"	"	"	
Methyl tert-butyl ether	<1.8	1.8	0.19	ug/m³	1	"	"	"	"	
Methylene chloride	<1.7	1.7	0.76	ug/m³	1	"	"	"	"	
Naphthalene	**4.2**	2.6	0.47	ug/m³	1	"	"	"	"	
n-Heptane	**21**	2.0	0.39	ug/m³	1	"	"	"	"	
n-Hexane	**20**	1.8	0.32	ug/m³	1	"	"	"	"	
o-Xylene	**17**	0.87	0.25	ug/m³	1	"	"	"	"	
Propylene	<0.86	0.86	0.13	ug/m³	1	"	"	"	"	
Styrene	<2.1	2.1	0.37	ug/m³	1	"	"	"	"	
Tetrachloroethene	<3.4	3.4	0.59	ug/m³	1	"	"	"	"	
Tetrahydrofuran	**11**	1.5	0.56	ug/m³	1	"	"	"	"	
Toluene	**29**	0.75	0.28	ug/m³	1	"	"	"	"	
trans-1,2-Dichloroethene	<2.0	2.0	0.38	ug/m³	1	"	"	"	"	
trans-1,3-Dichloropropene	<2.3	2.3	0.54	ug/m³	1	"	"	"	"	
Trichloroethene	<1.1	1.1	0.49	ug/m³	1	"	"	"	"	
Trichlorofluoromethane	<2.8	2.8	0.20	ug/m³	1	"	"	"	"	
Trichlorotrifluoroethane	<3.8	3.8	0.21	ug/m³	1	"	"	"	"	
Vinyl acetate	<1.8	1.8	0.20	ug/m³	1	"	"	"	"	
Vinyl chloride	<0.51	0.51	0.14	ug/m³	1	"	"	"	"	
Canister #00378 (2104671-04) Air Sampled: 06/04/21 00:00 Received: 10/12/21 9:53										
1,1,1-Trichloroethane	<2.7	2.7	0.54	ug/m³	1	B1K0514	06/04/21	06/05/21	TO-15	
1,1,2,2-Tetrachloroethane	<3.4	3.4	0.82	ug/m³	1	"	"	"	"	
1,1,2-Trichloroethane	<2.7	2.7	0.65	ug/m³	1	"	"	"	"	
1,1-Dichloroethane	<2.0	2.0	0.29	ug/m³	1	"	"	"	"	
1,1-Dichloroethene	<2.0	2.0	0.34	ug/m³	1	"	"	"	"	

LEGEND Technical Services, Inc.

88 Empire Drive
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Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Canister #00378 (2104671-04) Air Sampled: 06/04/21 00:00 Received: 10/12/21 9:53										
1,2,4-Trichlorobenzene	<3.7	3.7	0.82	ug/m³	1	B1K0514	06/04/21	06/05/21	TO-15	
1,2,4-Trimethylbenzene	<0.98	0.98	0.24	ug/m³	1	"	"	"	"	
1,2-Dibromoethane	<3.8	3.8	0.53	ug/m³	1	"	"	"	"	
1,2-Dichlorobenzene	<3.0	3.0	0.37	ug/m³	1	"	"	"	"	
1,2-Dichloroethane	<2.0	2.0	0.69	ug/m³	1	"	"	"	"	
1,2-Dichloropropane	<2.3	2.3	0.69	ug/m³	1	"	"	"	"	
1,3,5-Trimethylbenzene	<0.98	0.98	0.27	ug/m³	1	"	"	"	"	
1,3-Butadiene	<1.1	1.1	0.29	ug/m³	1	"	"	"	"	
1,3-Dichlorobenzene	<3.0	3.0	0.44	ug/m³	1	"	"	"	"	
1,4-Dichlorobenzene	<3.0	3.0	0.44	ug/m³	1	"	"	"	"	
2-Butanone	<1.5	1.5	0.24	ug/m³	1	"	"	"	"	
4-Ethyltoluene	<2.5	2.5	0.49	ug/m³	1	"	"	"	"	
Acetone	<1.2	1.2	0.26	ug/m³	1	"	"	"	"	
Benzene	<0.64	0.64	0.29	ug/m³	1	"	"	"	"	
Benzyl chloride	<2.6	2.6	0.62	ug/m³	1	"	"	"	"	
Bromodichloromethane	<3.4	3.4	0.94	ug/m³	1	"	"	"	"	
Bromoform	<5.2	5.2	0.68	ug/m³	1	"	"	"	"	
Bromomethane	<1.9	1.9	0.10	ug/m³	1	"	"	"	"	
Carbon disulfide	<1.6	1.6	0.22	ug/m³	1	"	"	"	"	
Carbon tetrachloride	<3.1	3.1	0.59	ug/m³	1	"	"	"	"	
Chlorobenzene	<2.3	2.3	0.45	ug/m³	1	"	"	"	"	
Chloroethane	<1.3	1.3	0.18	ug/m³	1	"	"	"	"	
Chloroform	<2.4	2.4	0.63	ug/m³	1	"	"	"	"	
Chloromethane	<1.0	1.0	0.17	ug/m³	1	"	"	"	"	
cis-1,2-Dichloroethene	<2.0	2.0	0.27	ug/m³	1	"	"	"	"	
cis-1,3-Dichloropropene	<2.3	2.3	0.82	ug/m³	1	"	"	"	"	
Cyclohexane	<1.7	1.7	0.52	ug/m³	1	"	"	"	"	
Dibromochloromethane	<4.3	4.3	0.82	ug/m³	1	"	"	"	"	
Dichlorodifluoromethane	<2.5	2.5	0.19	ug/m³	1	"	"	"	"	
Dichlorotetrafluoroethane	<3.5	3.5	0.28	ug/m³	1	"	"	"	"	
Ethanol	<0.94	0.94	0.24	ug/m³	1	"	"	"	"	
Ethyl acetate	<1.8	1.8	0.40	ug/m³	1	"	"	"	"	
Ethylbenzene	<0.87	0.87	0.28	ug/m³	1	"	"	"	"	
Hexachlorobutadiene	<5.3	5.3	1.4	ug/m³	1	"	"	"	"	
Isopropyl alcohol	<1.2	1.2	0.20	ug/m³	1	"	"	"	"	
m,p-Xylene	<1.7	1.7	0.48	ug/m³	1	"	"	"	"	
Methyl butyl ketone	<2.0	2.0	0.49	ug/m³	1	"	"	"	"	
Methyl isobutyl ketone	<2.0	2.0	0.41	ug/m³	1	"	"	"	"	
Methyl tert-butyl ether	<1.8	1.8	0.19	ug/m³	1	"	"	"	"	

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Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Canister #00378 (2104671-04) Air Sampled: 06/04/21 00:00 Received: 10/12/21 9:53										
Methylene chloride	<1.7	1.7	0.76	ug/m³	1	B1K0514	06/04/21	06/05/21	TO-15	
Naphthalene	<2.6	2.6	0.47	ug/m³	1	"	"	"	"	
n-Heptane	<2.0	2.0	0.39	ug/m³	1	"	"	"	"	
n-Hexane	<1.8	1.8	0.32	ug/m³	1	"	"	"	"	
o-Xylene	<0.87	0.87	0.25	ug/m³	1	"	"	"	"	
Propylene	<0.86	0.86	0.13	ug/m³	1	"	"	"	"	
Styrene	<2.1	2.1	0.37	ug/m³	1	"	"	"	"	
Tetrachloroethene	<3.4	3.4	0.59	ug/m³	1	"	"	"	"	
Tetrahydrofuran	<1.5	1.5	0.56	ug/m³	1	"	"	"	"	
Toluene	<0.75	0.75	0.28	ug/m³	1	"	"	"	"	
trans-1,2-Dichloroethene	<2.0	2.0	0.38	ug/m³	1	"	"	"	"	
trans-1,3-Dichloropropene	<2.3	2.3	0.54	ug/m³	1	"	"	"	"	
Trichloroethene	<1.1	1.1	0.49	ug/m³	1	"	"	"	"	
Trichlorofluoromethane	<2.8	2.8	0.20	ug/m³	1	"	"	"	"	
Trichlorotrifluoroethane	<3.8	3.8	0.21	ug/m³	1	"	"	"	"	
Vinyl acetate	<1.8	1.8	0.20	ug/m³	1	"	"	"	"	
Vinyl chloride	<0.51	0.51	0.14	ug/m³	1	"	"	"	"	
Canister #00382 (2104671-05) Air Sampled: 06/04/21 00:00 Received: 10/12/21 9:53										
1,1,1-Trichloroethane	<2.7	2.7	0.54	ug/m³	1	B1K0514	06/04/21	06/04/21	TO-15	
1,1,2,2-Tetrachloroethane	<3.4	3.4	0.82	ug/m³	1	"	"	"	"	
1,1,2-Trichloroethane	<2.7	2.7	0.65	ug/m³	1	"	"	"	"	
1,1-Dichloroethane	<2.0	2.0	0.29	ug/m³	1	"	"	"	"	
1,1-Dichloroethene	<2.0	2.0	0.34	ug/m³	1	"	"	"	"	
1,2,4-Trichlorobenzene	<3.7	3.7	0.82	ug/m³	1	"	"	"	"	
1,2,4-Trimethylbenzene	<0.98	0.98	0.24	ug/m³	1	"	"	"	"	
1,2-Dibromoethane	<3.8	3.8	0.53	ug/m³	1	"	"	"	"	
1,2-Dichlorobenzene	<3.0	3.0	0.37	ug/m³	1	"	"	"	"	
1,2-Dichloroethane	<2.0	2.0	0.69	ug/m³	1	"	"	"	"	
1,2-Dichloropropane	<2.3	2.3	0.69	ug/m³	1	"	"	"	"	
1,3,5-Trimethylbenzene	<0.98	0.98	0.27	ug/m³	1	"	"	"	"	
1,3-Butadiene	<1.1	1.1	0.29	ug/m³	1	"	"	"	"	
1,3-Dichlorobenzene	<3.0	3.0	0.44	ug/m³	1	"	"	"	"	
1,4-Dichlorobenzene	<3.0	3.0	0.44	ug/m³	1	"	"	"	"	
2-Butanone	<1.5	1.5	0.24	ug/m³	1	"	"	"	"	
4-Ethyltoluene	<2.5	2.5	0.49	ug/m³	1	"	"	"	"	
Acetone	<1.2	1.2	0.26	ug/m³	1	"	"	"	"	
Benzene	<0.64	0.64	0.29	ug/m³	1	"	"	"	"	
Benzyl chloride	<2.6	2.6	0.62	ug/m³	1	"	"	"	"	

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Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Canister #00382 (2104671-05) Air Sampled: 06/04/21 00:00 Received: 10/12/21 9:53										
Bromodichloromethane	<3.4	3.4	0.94	ug/m³	1	B1K0514	06/04/21	06/04/21	TO-15	
Bromoform	<5.2	5.2	0.68	ug/m³	1	"	"	"	"	
Bromomethane	<1.9	1.9	0.10	ug/m³	1	"	"	"	"	
Carbon disulfide	<1.6	1.6	0.22	ug/m³	1	"	"	"	"	
Carbon tetrachloride	<3.1	3.1	0.59	ug/m³	1	"	"	"	"	
Chlorobenzene	<2.3	2.3	0.45	ug/m³	1	"	"	"	"	
Chloroethane	<1.3	1.3	0.18	ug/m³	1	"	"	"	"	
Chloroform	<2.4	2.4	0.63	ug/m³	1	"	"	"	"	
Chloromethane	<1.0	1.0	0.17	ug/m³	1	"	"	"	"	
cis-1,2-Dichloroethene	<2.0	2.0	0.27	ug/m³	1	"	"	"	"	
cis-1,3-Dichloropropene	<2.3	2.3	0.82	ug/m³	1	"	"	"	"	
Cyclohexane	<1.7	1.7	0.52	ug/m³	1	"	"	"	"	
Dibromochloromethane	<4.3	4.3	0.82	ug/m³	1	"	"	"	"	
Dichlorodifluoromethane	<2.5	2.5	0.19	ug/m³	1	"	"	"	"	
Dichlorotetrafluoroethane	<3.5	3.5	0.28	ug/m³	1	"	"	"	"	
Ethanol	<0.94	0.94	0.24	ug/m³	1	"	"	"	"	
Ethyl acetate	<1.8	1.8	0.40	ug/m³	1	"	"	"	"	
Ethylbenzene	<0.87	0.87	0.28	ug/m³	1	"	"	"	"	
Hexachlorobutadiene	<5.3	5.3	1.4	ug/m³	1	"	"	"	"	
Isopropyl alcohol	<1.2	1.2	0.20	ug/m³	1	"	"	"	"	
m,p-Xylene	<1.7	1.7	0.48	ug/m³	1	"	"	"	"	
Methyl butyl ketone	<2.0	2.0	0.49	ug/m³	1	"	"	"	"	
Methyl isobutyl ketone	<2.0	2.0	0.41	ug/m³	1	"	"	"	"	
Methyl tert-butyl ether	<1.8	1.8	0.19	ug/m³	1	"	"	"	"	
Methylene chloride	<1.7	1.7	0.76	ug/m³	1	"	"	"	"	
Naphthalene	<2.6	2.6	0.47	ug/m³	1	"	"	"	"	
n-Heptane	<2.0	2.0	0.39	ug/m³	1	"	"	"	"	
n-Hexane	<1.8	1.8	0.32	ug/m³	1	"	"	"	"	
o-Xylene	<0.87	0.87	0.25	ug/m³	1	"	"	"	"	
Propylene	<0.86	0.86	0.13	ug/m³	1	"	"	"	"	
Styrene	<2.1	2.1	0.37	ug/m³	1	"	"	"	"	
Tetrachloroethene	<3.4	3.4	0.59	ug/m³	1	"	"	"	"	
Tetrahydrofuran	<1.5	1.5	0.56	ug/m³	1	"	"	"	"	
Toluene	<0.75	0.75	0.28	ug/m³	1	"	"	"	"	
trans-1,2-Dichloroethene	<2.0	2.0	0.38	ug/m³	1	"	"	"	"	
trans-1,3-Dichloropropene	<2.3	2.3	0.54	ug/m³	1	"	"	"	"	
Trichloroethene	<1.1	1.1	0.49	ug/m³	1	"	"	"	"	
Trichlorofluoromethane	<2.8	2.8	0.20	ug/m³	1	"	"	"	"	
Trichlorotrifluoroethane	<3.8	3.8	0.21	ug/m³	1	"	"	"	"	

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Canister #00382 (2104671-05) Air Sampled: 06/04/21 00:00 Received: 10/12/21 9:53										
Vinyl acetate	<1.8	1.8	0.20	ug/m³	1	B1K0514	06/04/21	06/04/21	TO-15	
Vinyl chloride	<0.51	0.51	0.14	ug/m³	1	"	"	"	"	
Canister #00437 (2104671-06) Air Sampled: 08/11/21 00:00 Received: 10/12/21 9:53										
1,1,1-Trichloroethane	<2.7	2.7	0.54	ug/m³	1	B1K0514	08/11/21	08/11/21	TO-15	
1,1,2,2-Tetrachloroethane	<3.4	3.4	0.82	ug/m³	1	"	"	"	"	
1,1,2-Trichloroethane	<2.7	2.7	0.65	ug/m³	1	"	"	"	"	
1,1-Dichloroethane	<2.0	2.0	0.29	ug/m³	1	"	"	"	"	
1,1-Dichloroethene	<2.0	2.0	0.34	ug/m³	1	"	"	"	"	
1,2,4-Trichlorobenzene	<3.7	3.7	0.82	ug/m³	1	"	"	"	"	
1,2,4-Trimethylbenzene	<0.98	0.98	0.24	ug/m³	1	"	"	"	"	
1,2-Dibromoethane	<3.8	3.8	0.53	ug/m³	1	"	"	"	"	
1,2-Dichlorobenzene	<3.0	3.0	0.37	ug/m³	1	"	"	"	"	
1,2-Dichloroethane	<2.0	2.0	0.69	ug/m³	1	"	"	"	"	
1,2-Dichloropropane	<2.3	2.3	0.69	ug/m³	1	"	"	"	"	
1,3,5-Trimethylbenzene	<0.98	0.98	0.27	ug/m³	1	"	"	"	"	
1,3-Butadiene	<1.1	1.1	0.29	ug/m³	1	"	"	"	"	
1,3-Dichlorobenzene	<3.0	3.0	0.44	ug/m³	1	"	"	"	"	
1,4-Dichlorobenzene	<3.0	3.0	0.44	ug/m³	1	"	"	"	"	
2-Butanone	<1.5	1.5	0.24	ug/m³	1	"	"	"	"	
4-Ethyltoluene	<2.5	2.5	0.49	ug/m³	1	"	"	"	"	
Acetone	<1.2	1.2	0.26	ug/m³	1	"	"	"	"	
Benzene	<0.64	0.64	0.29	ug/m³	1	"	"	"	"	
Benzyl chloride	<2.6	2.6	0.62	ug/m³	1	"	"	"	"	
Bromodichloromethane	<3.4	3.4	0.94	ug/m³	1	"	"	"	"	
Bromoform	<5.2	5.2	0.68	ug/m³	1	"	"	"	"	
Bromomethane	<1.9	1.9	0.10	ug/m³	1	"	"	"	"	
Carbon disulfide	<1.6	1.6	0.22	ug/m³	1	"	"	"	"	
Carbon tetrachloride	<3.1	3.1	0.59	ug/m³	1	"	"	"	"	
Chlorobenzene	<2.3	2.3	0.45	ug/m³	1	"	"	"	"	
Chloroethane	<1.3	1.3	0.18	ug/m³	1	"	"	"	"	
Chloroform	<2.4	2.4	0.63	ug/m³	1	"	"	"	"	
Chloromethane	<1.0	1.0	0.17	ug/m³	1	"	"	"	"	
cis-1,2-Dichloroethene	<2.0	2.0	0.27	ug/m³	1	"	"	"	"	
cis-1,3-Dichloropropene	<2.3	2.3	0.82	ug/m³	1	"	"	"	"	
Cyclohexane	<1.7	1.7	0.52	ug/m³	1	"	"	"	"	
Dibromochloromethane	<4.3	4.3	0.82	ug/m³	1	"	"	"	"	
Dichlorodifluoromethane	<2.5	2.5	0.19	ug/m³	1	"	"	"	"	
Dichlorotetrafluoroethane	<3.5	3.5	0.28	ug/m³	1	"	"	"	"	

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Canister #00437 (2104671-06) Air Sampled: 08/11/21 00:00 Received: 10/12/21 9:53										
Ethanol	<0.94	0.94	0.24	ug/m³	1	B1K0514	08/11/21	08/11/21	TO-15	
Ethyl acetate	<1.8	1.8	0.40	ug/m³	1	"	"	"	"	
Ethylbenzene	<0.87	0.87	0.28	ug/m³	1	"	"	"	"	
Hexachlorobutadiene	<5.3	5.3	1.4	ug/m³	1	"	"	"	"	
Isopropyl alcohol	<1.2	1.2	0.20	ug/m³	1	"	"	"	"	
m,p-Xylene	<1.7	1.7	0.48	ug/m³	1	"	"	"	"	
Methyl butyl ketone	<2.0	2.0	0.49	ug/m³	1	"	"	"	"	
Methyl isobutyl ketone	<2.0	2.0	0.41	ug/m³	1	"	"	"	"	
Methyl tert-butyl ether	<1.8	1.8	0.19	ug/m³	1	"	"	"	"	
Methylene chloride	<1.7	1.7	0.76	ug/m³	1	"	"	"	"	
Naphthalene	<2.6	2.6	0.47	ug/m³	1	"	"	"	"	
n-Heptane	<2.0	2.0	0.39	ug/m³	1	"	"	"	"	
n-Hexane	<1.8	1.8	0.32	ug/m³	1	"	"	"	"	
o-Xylene	<0.87	0.87	0.25	ug/m³	1	"	"	"	"	
Propylene	<0.86	0.86	0.13	ug/m³	1	"	"	"	"	
Styrene	<2.1	2.1	0.37	ug/m³	1	"	"	"	"	
Tetrachloroethene	<3.4	3.4	0.59	ug/m³	1	"	"	"	"	
Tetrahydrofuran	<1.5	1.5	0.56	ug/m³	1	"	"	"	"	
Toluene	<0.75	0.75	0.28	ug/m³	1	"	"	"	"	
trans-1,2-Dichloroethene	<2.0	2.0	0.38	ug/m³	1	"	"	"	"	
trans-1,3-Dichloropropene	<2.3	2.3	0.54	ug/m³	1	"	"	"	"	
Trichloroethene	<1.1	1.1	0.49	ug/m³	1	"	"	"	"	
Trichlorofluoromethane	<2.8	2.8	0.20	ug/m³	1	"	"	"	"	
Trichlorotrifluoroethane	<3.8	3.8	0.21	ug/m³	1	"	"	"	"	
Vinyl acetate	<1.8	1.8	0.20	ug/m³	1	"	"	"	"	
Vinyl chloride	<0.51	0.51	0.14	ug/m³	1	"	"	"	"	

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

TENTATIVELY IDENTIFIED COMPOUNDS
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SS-1 (2104671-01) Air Sampled: 10/11/21 11:18 Received: 10/12/21 9:53										
1-Butanol	**17**			ug/m³	1	B1J2038	10/19/21	10/19/21	TO-15	T4
Butane	**57**			ug/m³	1	"	"	"	"	T4
Decane	**31**			ug/m³	1	"	"	"	"	T4
Dodecane	**130**			ug/m³	1	"	"	"	"	T4
Propane	**43**			ug/m³	1	"	"	"	"	T4
Silanol, trimethyl-	**43**			ug/m³	1	"	"	"	"	T4
Tridecane	**81**			ug/m³	1	"	"	"	"	T4
SS-2 (2104671-02) Air Sampled: 10/11/21 12:54 Received: 10/12/21 9:53										
2-Butanone, 3-methyl-	**33**			ug/m³	1	B1J2038	10/19/21	10/20/21	TO-15	T4
Decane	**230**			ug/m³	1	"	"	"	"	T4
Decane, 4-methyl-	**130**			ug/m³	1	"	"	"	"	T4
Dodecane	**100**			ug/m³	1	"	"	"	"	T4
Heptane, 2-methyl-	**46**			ug/m³	1	"	"	"	"	T4
Heptane, 3-ethyl-2-methyl-	**95**			ug/m³	1	"	"	"	"	T4
Hexane, 2,4-dimethyl-	**49**			ug/m³	1	"	"	"	"	T4
Nonane	**70**			ug/m³	1	"	"	"	"	T4
Pentane, 2,3,4-trimethyl-	**48**			ug/m³	1	"	"	"	"	T4
Undecane	**110**			ug/m³	1	"	"	"	"	T4
SS-3 (2104671-03) Air Sampled: 10/11/21 13:47 Received: 10/12/21 9:53										
1-Heptene	**36**			ug/m³	1	B1J2038	10/19/21	10/20/21	TO-15	T4
2-Pentanone	**63**			ug/m³	1	"	"	"	"	T4
Acetaldehyde	**19**			ug/m³	1	"	"	"	"	T4
Cyclopentanone, 2-methyl-	**26**			ug/m³	1	"	"	"	"	T4
Decane	**58**			ug/m³	1	"	"	"	"	T4
Dodecane	**140**			ug/m³	1	"	"	"	"	T4
Heptane, 2-methyl-	**30**			ug/m³	1	"	"	"	"	T4
Hexane, 2,4-dimethyl-	**36**			ug/m³	1	"	"	"	"	T4
Silanol, trimethyl-	**42**			ug/m³	1	"	"	"	"	T4
Undecane	**110**			ug/m³	1	"	"	"	"	T4
Canister #00378 (2104671-04) Air Sampled: 06/04/21 00:00 Received: 10/12/21 9:53										
Tentatively Identified Compounds	ND			ug/m³	1	B1K0514	06/04/21	06/05/21	TO-15	A-02
Canister #00382 (2104671-05) Air Sampled: 06/04/21 00:00 Received: 10/12/21 9:53										
Tentatively Identified Compounds	ND			ug/m³	1	B1K0514	06/04/21	06/04/21	TO-15	A-02
Canister #00437 (2104671-06) Air Sampled: 08/11/21 00:00 Received: 10/12/21 9:53										
Tentatively Identified Compounds	ND			ug/m³	1	B1K0514	08/11/21	08/11/21	TO-15	A-02

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B1J2038 - TO-15											
Blank (B1J2038-BLK1)					Prepared & Analyzed: 10/19/21						
1,1,1-Trichloroethane	< 2.7	2.7	0.54	ug/m³							
1,1,2,2-Tetrachloroethane	< 3.4	3.4	0.82	ug/m³							
1,1,2-Trichloroethane	< 2.7	2.7	0.65	ug/m³							
1,1-Dichloroethane	< 2.0	2.0	0.29	ug/m³							
1,1-Dichloroethene	< 2.0	2.0	0.34	ug/m³							
1,2,4-Trichlorobenzene	< 3.7	3.7	0.82	ug/m³							
1,2,4-Trimethylbenzene	< 0.98	0.98	0.24	ug/m³							
1,2-Dibromoethane	< 3.8	3.8	0.53	ug/m³							
1,2-Dichlorobenzene	< 3.0	3.0	0.37	ug/m³							
1,2-Dichloroethane	< 2.0	2.0	0.69	ug/m³							
1,2-Dichloropropane	< 2.3	2.3	0.69	ug/m³							
1,3,5-Trimethylbenzene	< 0.98	0.98	0.27	ug/m³							
1,3-Butadiene	< 1.1	1.1	0.29	ug/m³							
1,3-Dichlorobenzene	< 3.0	3.0	0.44	ug/m³							
1,4-Dichlorobenzene	< 3.0	3.0	0.44	ug/m³							
2-Butanone	< 1.5	1.5	0.24	ug/m³							
4-Ethyltoluene	< 2.5	2.5	0.49	ug/m³							
Acetone	< 1.2	1.2	0.26	ug/m³							
Benzene	< 0.64	0.64	0.29	ug/m³							
Benzyl chloride	< 2.6	2.6	0.62	ug/m³							
Bromodichloromethane	< 3.4	3.4	0.94	ug/m³							
Bromoform	< 5.2	5.2	0.68	ug/m³							
Bromomethane	< 1.9	1.9	0.10	ug/m³							
Carbon disulfide	< 1.6	1.6	0.22	ug/m³							
Carbon tetrachloride	< 3.1	3.1	0.59	ug/m³							
Chlorobenzene	< 2.3	2.3	0.45	ug/m³							
Chloroethane	< 1.3	1.3	0.18	ug/m³							
Chloroform	< 2.4	2.4	0.63	ug/m³							
Chloromethane	< 1.0	1.0	0.17	ug/m³							
cis-1,2-Dichloroethene	< 2.0	2.0	0.27	ug/m³							
cis-1,3-Dichloropropene	< 2.3	2.3	0.82	ug/m³							
Cyclohexane	< 1.7	1.7	0.52	ug/m³							
Dibromochloromethane	< 4.3	4.3	0.82	ug/m³							
Dichlorodifluoromethane	< 2.5	2.5	0.19	ug/m³							
Dichlorotetrafluoroethane	< 3.5	3.5	0.28	ug/m³							
Ethanol	< 0.94	0.94	0.24	ug/m³							
Ethyl acetate	< 1.8	1.8	0.40	ug/m³							
Ethylbenzene	< 0.87	0.87	0.28	ug/m³							
Hexachlorobutadiene	< 5.3	5.3	1.4	ug/m³							

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B1J2038 - TO-15											
Blank (B1J2038-BLK1)					Prepared & Analyzed: 10/19/21						
Isopropyl alcohol	< 1.2	1.2	0.20	ug/m³							
m,p-Xylene	< 1.7	1.7	0.48	ug/m³							
Methyl butyl ketone	< 2.0	2.0	0.49	ug/m³							
Methyl isobutyl ketone	< 2.0	2.0	0.41	ug/m³							
Methyl tert-butyl ether	< 1.8	1.8	0.19	ug/m³							
Methylene chloride	< 1.7	1.7	0.76	ug/m³							
Naphthalene	< 2.6	2.6	0.47	ug/m³							
n-Heptane	< 2.0	2.0	0.39	ug/m³							
n-Hexane	< 1.8	1.8	0.32	ug/m³							
o-Xylene	< 0.87	0.87	0.25	ug/m³							
Propylene	< 0.86	0.86	0.13	ug/m³							
Styrene	< 2.1	2.1	0.37	ug/m³							
Tetrachloroethene	< 3.4	3.4	0.59	ug/m³							
Tetrahydrofuran	< 1.5	1.5	0.56	ug/m³							
Toluene	< 0.75	0.75	0.28	ug/m³							
trans-1,2-Dichloroethene	< 2.0	2.0	0.38	ug/m³							
trans-1,3-Dichloropropene	< 2.3	2.3	0.54	ug/m³							
Trichloroethene	< 1.1	1.1	0.49	ug/m³							
Trichlorofluoromethane	< 2.8	2.8	0.20	ug/m³							
Trichlorotrifluoroethane	< 3.8	3.8	0.21	ug/m³							
Vinyl acetate	< 1.8	1.8	0.20	ug/m³							
Vinyl chloride	< 0.51	0.51	0.14	ug/m³							
LCS (B1J2038-BS1)					Prepared & Analyzed: 10/19/21						
1,1,1-Trichloroethane	51.1	2.7	0.54	ug/m³	54.6	<2.7	93.6	70-130			
1,1,2,2-Tetrachloroethane	61.5	3.4	0.82	ug/m³	68.6	<3.4	89.6	70-130			
1,1,2-Trichloroethane	51.3	2.7	0.65	ug/m³	54.6	<2.7	94.0	70-130			
1,1-Dichloroethane	36.9	2.0	0.29	ug/m³	40.5	<2.0	91.1	70-130			
1,1-Dichloroethene	36.3	2.0	0.34	ug/m³	39.6	<2.0	91.7	70-130			
1,2,4-Trichlorobenzene	80.1	3.7	0.82	ug/m³	74.2	<3.7	108	70-130			
1,2,4-Trimethylbenzene	49.1	0.98	0.24	ug/m³	49.2	<0.98	99.9	70-130			
1,2-Dibromoethane	74.1	3.8	0.53	ug/m³	76.8	<3.8	96.4	70-130			
1,2-Dichlorobenzene	59.5	3.0	0.37	ug/m³	60.1	<3.0	99.0	70-130			
1,2-Dichloroethane	38.0	2.0	0.69	ug/m³	40.5	<2.0	94.0	70-130			
1,2-Dichloropropane	42.6	2.3	0.69	ug/m³	46.2	<2.3	92.2	70-130			
1,3,5-Trimethylbenzene	49.3	0.98	0.27	ug/m³	49.2	<0.98	100	70-130			
1,3-Butadiene	19.9	1.1	0.29	ug/m³	22.1	<1.1	90.1	70-130			
1,3-Dichlorobenzene	63.2	3.0	0.44	ug/m³	60.1	<3.0	105	70-130			
1,4-Dichlorobenzene	66.0	3.0	0.44	ug/m³	60.1	<3.0	110	70-130			
2-Butanone	27.5	1.5	0.24	ug/m³	29.5	<1.5	93.2	70-130			

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B1J2038 - TO-15											
LCS (B1J2038-BS1)					Prepared & Analyzed: 10/19/21						
4-Ethyltoluene	45.3	2.5	0.49	ug/m³	49.2	<2.5	92.1	70-130			
Acetone	22.4	1.2	0.26	ug/m³	23.8	<1.2	94.1	70-130			
Benzene	29.3	0.64	0.29	ug/m³	31.9	<0.64	91.8	70-130			
Benzyl chloride	55.9	2.6	0.62	ug/m³	51.8	<2.6	108	70-130			
Bromodichloromethane	63.0	3.4	0.94	ug/m³	67.0	<3.4	93.9	70-130			
Bromoform	101	5.2	0.68	ug/m³	103	<5.2	97.9	70-130			
Bromomethane	34.3	1.9	0.10	ug/m³	38.8	<1.9	88.4	70-130			
Carbon disulfide	27.8	1.6	0.22	ug/m³	31.1	<1.6	89.2	70-130			
Carbon tetrachloride	60.1	3.1	0.59	ug/m³	62.9	<3.1	95.5	70-130			
Chlorobenzene	43.0	2.3	0.45	ug/m³	46.0	<2.3	93.3	70-130			
Chloroethane	24.0	1.3	0.18	ug/m³	26.4	<1.3	90.8	70-130			
Chloroform	45.6	2.4	0.63	ug/m³	48.8	<2.4	93.4	70-130			
Chloromethane	18.5	1.0	0.17	ug/m³	20.6	<1.0	89.6	70-130			
cis-1,2-Dichloroethene	36.5	2.0	0.27	ug/m³	39.6	<2.0	92.1	70-130			
cis-1,3-Dichloropropene	43.5	2.3	0.82	ug/m³	45.4	<2.3	95.9	70-130			
Cyclohexane	30.8	1.7	0.52	ug/m³	34.4	<1.7	89.6	70-130			
Dibromochloromethane	81.8	4.3	0.82	ug/m³	85.2	<4.3	96.1	70-130			
Dichlorodifluoromethane	46.8	2.5	0.19	ug/m³	49.5	<2.5	94.7	70-130			
Dichlorotetrafluoroethane	62.4	3.5	0.28	ug/m³	69.9	<3.5	89.3	70-130			
Ethanol	16.9	0.94	0.24	ug/m³	18.8	<0.94	89.6	70-130			
Ethyl acetate	32.4	1.8	0.40	ug/m³	36.0	<1.8	89.8	70-130			
Ethylbenzene	40.6	0.87	0.28	ug/m³	43.4	<0.87	93.4	70-130			
Hexachlorobutadiene	92.0	5.3	1.4	ug/m³	107	<5.3	86.2	70-130			
Isopropyl alcohol	21.9	1.2	0.20	ug/m³	24.6	<1.2	89.3	70-130			
m,p-Xylene	78.9	1.7	0.48	ug/m³	86.8	<1.7	90.8	70-130			
Methyl butyl ketone	38.3	2.0	0.49	ug/m³	41.0	<2.0	93.4	70-130			
Methyl isobutyl ketone	36.2	2.0	0.41	ug/m³	41.0	<2.0	88.4	70-130			
Methyl tert-butyl ether	31.8	1.8	0.19	ug/m³	36.1	<1.8	88.1	70-130			
Methylene chloride	31.1	1.7	0.76	ug/m³	34.7	<1.7	89.6	70-130			
Naphthalene	58.1	2.6	0.47	ug/m³	55.0	<2.6	106	70-130			
n-Heptane	37.9	2.0	0.39	ug/m³	41.0	<2.0	92.4	70-130			
n-Hexane	31.8	1.8	0.32	ug/m³	35.2	<1.8	90.2	70-130			
o-Xylene	39.0	0.87	0.25	ug/m³	43.4	<0.87	89.9	70-130			
Propylene	15.6	0.86	0.13	ug/m³	17.2	<0.86	90.6	70-130			
Styrene	40.3	2.1	0.37	ug/m³	42.6	<2.1	94.7	70-130			
Tetrachloroethene	62.0	3.4	0.59	ug/m³	67.8	<3.4	91.4	70-130			
Tetrahydrofuran	26.4	1.5	0.56	ug/m³	29.5	<1.5	89.7	70-130			
Toluene	34.6	0.75	0.28	ug/m³	37.7	<0.75	91.8	70-130			
trans-1,2-Dichloroethene	35.6	2.0	0.38	ug/m³	39.6	<2.0	89.9	70-130			

LEGEND Technical Services, Inc.

88 Empire Drive
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Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B1J2038 - TO-15											
LCS (B1J2038-BS1)					Prepared & Analyzed: 10/19/21						
trans-1,3-Dichloropropene	44.0	2.3	0.54	ug/m³	45.4	<2.3	97.0	70-130			
Trichloroethene	50.1	1.1	0.49	ug/m³	53.7	<1.1	93.3	70-130			
Trichlorofluoromethane	51.8	2.8	0.20	ug/m³	56.2	<2.8	92.2	70-130			
Trichlorotrifluoroethane	69.2	3.8	0.21	ug/m³	76.6	<3.8	90.2	70-130			
Vinyl acetate	31.3	1.8	0.20	ug/m³	35.2	<1.8	88.8	70-130			
Vinyl chloride	23.3	0.51	0.14	ug/m³	25.6	<0.51	91.0	70-130			
Duplicate (B1J2038-DUP1)		**Source: 2104671-01**			Prepared & Analyzed: 10/19/21						
1,1,1-Trichloroethane	< 2.7	2.7	0.54	ug/m³		<2.7			NA	25	
1,1,2,2-Tetrachloroethane	< 3.4	3.4	0.82	ug/m³		<3.4			NA	25	
1,1,2-Trichloroethane	< 2.7	2.7	0.65	ug/m³		<2.7			NA	25	
1,1-Dichloroethane	< 2.0	2.0	0.29	ug/m³		<2.0			NA	25	
1,1-Dichloroethene	< 2.0	2.0	0.34	ug/m³		<2.0			NA	25	
1,2,4-Trichlorobenzene	< 3.7	3.7	0.82	ug/m³		<3.7			NA	25	
1,2,4-Trimethylbenzene	1.39	0.98	0.24	ug/m³		1.33			4.62	25	
1,2-Dibromoethane	< 3.8	3.8	0.53	ug/m³		<3.8			NA	25	
1,2-Dichlorobenzene	< 3.0	3.0	0.37	ug/m³		<3.0			NA	25	
1,2-Dichloroethane	< 2.0	2.0	0.69	ug/m³		<2.0			NA	25	
1,2-Dichloropropane	< 2.3	2.3	0.69	ug/m³		<2.3			NA	25	
1,3,5-Trimethylbenzene	< 0.98	0.98	0.27	ug/m³		<0.98			NA	25	
1,3-Butadiene	< 1.1	1.1	0.29	ug/m³		<1.1			NA	25	
1,3-Dichlorobenzene	< 3.0	3.0	0.44	ug/m³		<3.0			NA	25	
1,4-Dichlorobenzene	< 3.0	3.0	0.44	ug/m³		<3.0			NA	25	
2-Butanone	7.77	1.5	0.24	ug/m³		7.82			0.549	25	
4-Ethyltoluene	< 2.5	2.5	0.49	ug/m³		<2.5			NA	25	
Acetone	81.2	36	7.8	ug/m³		87.1			6.99	25	
Benzene	< 0.64	0.64	0.29	ug/m³		<0.64			NA	25	
Benzyl chloride	< 2.6	2.6	0.62	ug/m³		<2.6			NA	25	
Bromodichloromethane	< 3.4	3.4	0.94	ug/m³		<3.4			NA	25	
Bromoform	< 5.2	5.2	0.68	ug/m³		<5.2			NA	25	
Bromomethane	< 1.9	1.9	0.10	ug/m³		<1.9			NA	25	
Carbon disulfide	< 1.6	1.6	0.22	ug/m³		<1.6			NA	25	
Carbon tetrachloride	< 3.1	3.1	0.59	ug/m³		<3.1			NA	25	
Chlorobenzene	< 2.3	2.3	0.45	ug/m³		<2.3			NA	25	
Chloroethane	< 1.3	1.3	0.18	ug/m³		<1.3			NA	25	
Chloroform	< 2.4	2.4	0.63	ug/m³		<2.4			NA	25	
Chloromethane	< 1.0	1.0	0.17	ug/m³		<1.0			NA	25	
cis-1,2-Dichloroethene	< 2.0	2.0	0.27	ug/m³		<2.0			NA	25	
cis-1,3-Dichloropropene	< 2.3	2.3	0.82	ug/m³		<2.3			NA	25	
Cyclohexane	< 1.7	1.7	0.52	ug/m³		<1.7			NA	25	

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B1J2038 - TO-15											
Duplicate (B1J2038-DUP1)		**Source: 2104671-01**			Prepared & Analyzed: 10/19/21						
Dibromochloromethane	< 4.3	4.3	0.82	ug/m³		<4.3			NA	25	
Dichlorodifluoromethane	4720	220	17	ug/m³		5090			7.62	25	
Dichlorotetrafluoroethane	< 3.5	3.5	0.28	ug/m³		<3.5			NA	25	
Ethanol	150	28	7.2	ug/m³		151			0.525	25	
Ethyl acetate	< 1.8	1.8	0.40	ug/m³		<1.8			NA	25	
Ethylbenzene	5.27	0.87	0.28	ug/m³		5.03			4.75	25	
Hexachlorobutadiene	< 5.3	5.3	1.4	ug/m³		<5.3			NA	25	
Isopropyl alcohol	33.3	1.2	0.20	ug/m³		31.5			5.74	25	
m,p-Xylene	20.2	1.7	0.48	ug/m³		19.3			4.25	25	
Methyl butyl ketone	< 2.0	2.0	0.49	ug/m³		<2.0			NA	25	
Methyl isobutyl ketone	< 2.0	2.0	0.41	ug/m³		<2.0			NA	25	
Methyl tert-butyl ether	< 1.8	1.8	0.19	ug/m³		<1.8			NA	25	
Methylene chloride	9.37	1.7	0.76	ug/m³		9.15			2.32	25	
Naphthalene	< 2.6	2.6	0.47	ug/m³		<2.6			NA	25	
n-Heptane	< 2.0	2.0	0.39	ug/m³		<2.0			NA	25	
n-Hexane	3.43	1.8	0.32	ug/m³		3.43			0.0925	25	
o-Xylene	5.61	0.87	0.25	ug/m³		5.30			5.60	25	
Propylene	< 0.86	0.86	0.13	ug/m³		<0.86			NA	25	
Styrene	< 2.1	2.1	0.37	ug/m³		<2.1			NA	25	
Tetrachloroethene	< 3.4	3.4	0.59	ug/m³		<3.4			NA	25	
Tetrahydrofuran	8.54	1.5	0.56	ug/m³		8.36			2.16	25	
Toluene	1.87	0.75	0.28	ug/m³		1.85			1.07	25	
trans-1,2-Dichloroethene	< 2.0	2.0	0.38	ug/m³		<2.0			NA	25	
trans-1,3-Dichloropropene	< 2.3	2.3	0.54	ug/m³		<2.3			NA	25	
Trichloroethene	< 1.1	1.1	0.49	ug/m³		<1.1			NA	25	
Trichlorofluoromethane	5.61	2.8	0.20	ug/m³		5.36			4.72	25	
Trichlorotrifluoroethane	< 3.8	3.8	0.21	ug/m³		<3.8			NA	25	
Vinyl acetate	< 1.8	1.8	0.20	ug/m³		<1.8			NA	25	
Vinyl chloride	< 0.51	0.51	0.14	ug/m³		<0.51			NA	25	

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Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B1K0514 - TO-15											
Blank (B1K0514-BLK1)					Prepared & Analyzed: 06/04/21						
1,1,1-Trichloroethane	< 2.7	2.7	0.54	ug/m³							
1,1,2,2-Tetrachloroethane	< 3.4	3.4	0.82	ug/m³							
1,1,2-Trichloroethane	< 2.7	2.7	0.65	ug/m³							
1,1-Dichloroethane	< 2.0	2.0	0.29	ug/m³							
1,1-Dichloroethene	< 2.0	2.0	0.34	ug/m³							
1,2,4-Trichlorobenzene	< 3.7	3.7	0.82	ug/m³							
1,2,4-Trimethylbenzene	< 0.98	0.98	0.24	ug/m³							
1,2-Dibromoethane	< 3.8	3.8	0.53	ug/m³							
1,2-Dichlorobenzene	< 3.0	3.0	0.37	ug/m³							
1,2-Dichloroethane	< 2.0	2.0	0.69	ug/m³							
1,2-Dichloropropane	< 2.3	2.3	0.69	ug/m³							
1,3,5-Trimethylbenzene	< 0.98	0.98	0.27	ug/m³							
1,3-Butadiene	< 1.1	1.1	0.29	ug/m³							
1,3-Dichlorobenzene	< 3.0	3.0	0.44	ug/m³							
1,4-Dichlorobenzene	< 3.0	3.0	0.44	ug/m³							
2-Butanone	< 1.5	1.5	0.24	ug/m³							
4-Ethyltoluene	< 2.5	2.5	0.49	ug/m³							
Acetone	< 1.2	1.2	0.26	ug/m³							
Benzene	< 0.64	0.64	0.29	ug/m³							
Benzyl chloride	< 2.6	2.6	0.62	ug/m³							
Bromodichloromethane	< 3.4	3.4	0.94	ug/m³							
Bromoform	< 5.2	5.2	0.68	ug/m³							
Bromomethane	< 1.9	1.9	0.10	ug/m³							
Carbon disulfide	< 1.6	1.6	0.22	ug/m³							
Carbon tetrachloride	< 3.1	3.1	0.59	ug/m³							
Chlorobenzene	< 2.3	2.3	0.45	ug/m³							
Chloroethane	< 1.3	1.3	0.18	ug/m³							
Chloroform	< 2.4	2.4	0.63	ug/m³							
Chloromethane	< 1.0	1.0	0.17	ug/m³							
cis-1,2-Dichloroethene	< 2.0	2.0	0.27	ug/m³							
cis-1,3-Dichloropropene	< 2.3	2.3	0.82	ug/m³							
Cyclohexane	< 1.7	1.7	0.52	ug/m³							
Dibromochloromethane	< 4.3	4.3	0.82	ug/m³							
Dichlorodifluoromethane	< 2.5	2.5	0.19	ug/m³							
Dichlorotetrafluoroethane	< 3.5	3.5	0.28	ug/m³							
Ethanol	< 0.94	0.94	0.24	ug/m³							
Ethyl acetate	< 1.8	1.8	0.40	ug/m³							
Ethylbenzene	< 0.87	0.87	0.28	ug/m³							
Hexachlorobutadiene	< 5.3	5.3	1.4	ug/m³							

LEGEND Technical Services, Inc.

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Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B1K0514 - TO-15											
Blank (B1K0514-BLK1)					Prepared & Analyzed: 06/04/21						
Isopropyl alcohol	< 1.2	1.2	0.20	ug/m³							
m,p-Xylene	< 1.7	1.7	0.48	ug/m³							
Methyl butyl ketone	< 2.0	2.0	0.49	ug/m³							
Methyl isobutyl ketone	< 2.0	2.0	0.41	ug/m³							
Methyl tert-butyl ether	< 1.8	1.8	0.19	ug/m³							
Methylene chloride	< 1.7	1.7	0.76	ug/m³							
Naphthalene	< 2.6	2.6	0.47	ug/m³							
n-Heptane	< 2.0	2.0	0.39	ug/m³							
n-Hexane	< 1.8	1.8	0.32	ug/m³							
o-Xylene	< 0.87	0.87	0.25	ug/m³							
Propylene	< 0.86	0.86	0.13	ug/m³							
Styrene	< 2.1	2.1	0.37	ug/m³							
Tetrachloroethene	< 3.4	3.4	0.59	ug/m³							
Tetrahydrofuran	< 1.5	1.5	0.56	ug/m³							
Toluene	< 0.75	0.75	0.28	ug/m³							
trans-1,2-Dichloroethene	< 2.0	2.0	0.38	ug/m³							
trans-1,3-Dichloropropene	< 2.3	2.3	0.54	ug/m³							
Trichloroethene	< 1.1	1.1	0.49	ug/m³							
Trichlorofluoromethane	< 2.8	2.8	0.20	ug/m³							
Trichlorotrifluoroethane	< 3.8	3.8	0.21	ug/m³							
Vinyl acetate	< 1.8	1.8	0.20	ug/m³							
Vinyl chloride	< 0.51	0.51	0.14	ug/m³							
Blank (B1K0514-BLK2)					Prepared & Analyzed: 08/11/21						
1,1,1-Trichloroethane	< 2.7	2.7	0.54	ug/m³							
1,1,2,2-Tetrachloroethane	< 3.4	3.4	0.82	ug/m³							
1,1,2-Trichloroethane	< 2.7	2.7	0.65	ug/m³							
1,1-Dichloroethane	< 2.0	2.0	0.29	ug/m³							
1,1-Dichloroethene	< 2.0	2.0	0.34	ug/m³							
1,2,4-Trichlorobenzene	< 3.7	3.7	0.82	ug/m³							
1,2,4-Trimethylbenzene	< 0.98	0.98	0.24	ug/m³							
1,2-Dibromoethane	< 3.8	3.8	0.53	ug/m³							
1,2-Dichlorobenzene	< 3.0	3.0	0.37	ug/m³							
1,2-Dichloroethane	< 2.0	2.0	0.69	ug/m³							
1,2-Dichloropropane	< 2.3	2.3	0.69	ug/m³							
1,3,5-Trimethylbenzene	< 0.98	0.98	0.27	ug/m³							
1,3-Butadiene	< 1.1	1.1	0.29	ug/m³							
1,3-Dichlorobenzene	< 3.0	3.0	0.44	ug/m³							
1,4-Dichlorobenzene	< 3.0	3.0	0.44	ug/m³							
2-Butanone	< 1.5	1.5	0.24	ug/m³							

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B1K0514 - TO-15											
Blank (B1K0514-BLK2)					Prepared & Analyzed: 08/11/21						
4-Ethyltoluene	< 2.5	2.5	0.49	ug/m³							
Acetone	< 1.2	1.2	0.26	ug/m³							
Benzene	< 0.64	0.64	0.29	ug/m³							
Benzyl chloride	< 2.6	2.6	0.62	ug/m³							
Bromodichloromethane	< 3.4	3.4	0.94	ug/m³							
Bromoform	< 5.2	5.2	0.68	ug/m³							
Bromomethane	< 1.9	1.9	0.10	ug/m³							
Carbon disulfide	< 1.6	1.6	0.22	ug/m³							
Carbon tetrachloride	< 3.1	3.1	0.59	ug/m³							
Chlorobenzene	< 2.3	2.3	0.45	ug/m³							
Chloroethane	< 1.3	1.3	0.18	ug/m³							
Chloroform	< 2.4	2.4	0.63	ug/m³							
Chloromethane	< 1.0	1.0	0.17	ug/m³							
cis-1,2-Dichloroethene	< 2.0	2.0	0.27	ug/m³							
cis-1,3-Dichloropropene	< 2.3	2.3	0.82	ug/m³							
Cyclohexane	< 1.7	1.7	0.52	ug/m³							
Dibromochloromethane	< 4.3	4.3	0.82	ug/m³							
Dichlorodifluoromethane	< 2.5	2.5	0.19	ug/m³							
Dichlorotetrafluoroethane	< 3.5	3.5	0.28	ug/m³							
Ethanol	< 0.94	0.94	0.24	ug/m³							
Ethyl acetate	< 1.8	1.8	0.40	ug/m³							
Ethylbenzene	< 0.87	0.87	0.28	ug/m³							
Hexachlorobutadiene	< 5.3	5.3	1.4	ug/m³							
Isopropyl alcohol	< 1.2	1.2	0.20	ug/m³							
m,p-Xylene	< 1.7	1.7	0.48	ug/m³							
Methyl butyl ketone	< 2.0	2.0	0.49	ug/m³							
Methyl isobutyl ketone	< 2.0	2.0	0.41	ug/m³							
Methyl tert-butyl ether	< 1.8	1.8	0.19	ug/m³							
Methylene chloride	< 1.7	1.7	0.76	ug/m³							
Naphthalene	< 2.6	2.6	0.47	ug/m³							
n-Heptane	< 2.0	2.0	0.39	ug/m³							
n-Hexane	< 1.8	1.8	0.32	ug/m³							
o-Xylene	< 0.87	0.87	0.25	ug/m³							
Propylene	< 0.86	0.86	0.13	ug/m³							
Styrene	< 2.1	2.1	0.37	ug/m³							
Tetrachloroethene	< 3.4	3.4	0.59	ug/m³							
Tetrahydrofuran	< 1.5	1.5	0.56	ug/m³							
Toluene	< 0.75	0.75	0.28	ug/m³							
trans-1,2-Dichloroethene	< 2.0	2.0	0.38	ug/m³							

LEGEND Technical Services, Inc.

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Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B1K0514 - TO-15											
Blank (B1K0514-BLK2)					Prepared & Analyzed: 08/11/21						
trans-1,3-Dichloropropene	< 2.3	2.3	0.54	ug/m³							
Trichloroethene	< 1.1	1.1	0.49	ug/m³							
Trichlorofluoromethane	< 2.8	2.8	0.20	ug/m³							
Trichlorotrifluoroethane	< 3.8	3.8	0.21	ug/m³							
Vinyl acetate	< 1.8	1.8	0.20	ug/m³							
Vinyl chloride	< 0.51	0.51	0.14	ug/m³							
LCS (B1K0514-BS1)					Prepared & Analyzed: 06/04/21						
1,1,1-Trichloroethane	52.2	2.7	0.54	ug/m³	54.6	<2.7	95.6	70-130			
1,1,2,2-Tetrachloroethane	64.5	3.4	0.82	ug/m³	68.6	<3.4	93.9	70-130			
1,1,2-Trichloroethane	53.4	2.7	0.65	ug/m³	54.6	<2.7	97.8	70-130			
1,1-Dichloroethane	39.4	2.0	0.29	ug/m³	40.5	<2.0	97.2	70-130			
1,1-Dichloroethene	39.0	2.0	0.34	ug/m³	39.6	<2.0	98.4	70-130			
1,2,4-Trichlorobenzene	79.8	3.7	0.82	ug/m³	74.2	<3.7	107	70-130			
1,2,4-Trimethylbenzene	45.3	0.98	0.24	ug/m³	49.2	<0.98	92.1	70-130			
1,2-Dibromoethane	74.3	3.8	0.53	ug/m³	76.8	<3.8	96.7	70-130			
1,2-Dichlorobenzene	58.4	3.0	0.37	ug/m³	60.1	<3.0	97.2	70-130			
1,2-Dichloroethane	38.2	2.0	0.69	ug/m³	40.5	<2.0	94.5	70-130			
1,2-Dichloropropane	43.7	2.3	0.69	ug/m³	46.2	<2.3	94.5	70-130			
1,3,5-Trimethylbenzene	43.8	0.98	0.27	ug/m³	49.2	<0.98	89.1	70-130			
1,3-Butadiene	22.3	1.1	0.29	ug/m³	22.1	<1.1	101	70-130			
1,3-Dichlorobenzene	65.0	3.0	0.44	ug/m³	60.1	<3.0	108	70-130			
1,4-Dichlorobenzene	67.7	3.0	0.44	ug/m³	60.1	<3.0	113	70-130			
2-Butanone	29.5	1.5	0.24	ug/m³	29.5	<1.5	100	70-130			
4-Ethyltoluene	48.0	2.5	0.49	ug/m³	49.2	<2.5	97.6	70-130			
Acetone	22.2	1.2	0.26	ug/m³	23.8	<1.2	93.5	70-130			
Benzene	30.2	0.64	0.29	ug/m³	31.9	<0.64	94.7	70-130			
Benzyl chloride	54.8	2.6	0.62	ug/m³	51.8	<2.6	106	70-130			
Bromodichloromethane	65.6	3.4	0.94	ug/m³	67.0	<3.4	97.9	70-130			
Bromoform	105	5.2	0.68	ug/m³	103	<5.2	101	70-130			
Bromomethane	39.2	1.9	0.10	ug/m³	38.8	<1.9	101	70-130			
Carbon disulfide	30.0	1.6	0.22	ug/m³	31.1	<1.6	96.5	70-130			
Carbon tetrachloride	60.1	3.1	0.59	ug/m³	62.9	<3.1	95.6	70-130			
Chlorobenzene	44.6	2.3	0.45	ug/m³	46.0	<2.3	97.0	70-130			
Chloroethane	26.1	1.3	0.18	ug/m³	26.4	<1.3	98.8	70-130			
Chloroform	47.4	2.4	0.63	ug/m³	48.8	<2.4	97.0	70-130			
Chloromethane	20.3	1.0	0.17	ug/m³	20.6	<1.0	98.1	70-130			
cis-1,2-Dichloroethene	39.0	2.0	0.27	ug/m³	39.6	<2.0	98.3	70-130			
cis-1,3-Dichloropropene	44.2	2.3	0.82	ug/m³	45.4	<2.3	97.4	70-130			
Cyclohexane	32.5	1.7	0.52	ug/m³	34.4	<1.7	94.5	70-130			

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B1K0514 - TO-15											
LCS (B1K0514-BS1)					Prepared & Analyzed: 06/04/21						
Dibromochloromethane	82.3	4.3	0.82	ug/m³	85.2	<4.3	96.6	70-130			
Dichlorodifluoromethane	51.0	2.5	0.19	ug/m³	49.5	<2.5	103	70-130			
Dichlorotetrafluoroethane	70.4	3.5	0.28	ug/m³	69.9	<3.5	101	70-130			
Ethanol	17.8	0.94	0.24	ug/m³	18.8	<0.94	94.6	70-130			
Ethyl acetate	34.7	1.8	0.40	ug/m³	36.0	<1.8	96.3	70-130			
Ethylbenzene	41.9	0.87	0.28	ug/m³	43.4	<0.87	96.5	70-130			
Hexachlorobutadiene	97.1	5.3	1.4	ug/m³	107	<5.3	91.1	70-130			
Isopropyl alcohol	22.7	1.2	0.20	ug/m³	24.6	<1.2	92.3	70-130			
m,p-Xylene	81.3	1.7	0.48	ug/m³	86.8	<1.7	93.6	70-130			
Methyl butyl ketone	38.6	2.0	0.49	ug/m³	41.0	<2.0	94.1	70-130			
Methyl isobutyl ketone	37.3	2.0	0.41	ug/m³	41.0	<2.0	91.1	70-130			
Methyl tert-butyl ether	33.8	1.8	0.19	ug/m³	36.1	<1.8	93.9	70-130			
Methylene chloride	33.7	1.7	0.76	ug/m³	34.7	<1.7	97.1	70-130			
Naphthalene	56.3	2.6	0.47	ug/m³	55.0	<2.6	102	70-130			
n-Heptane	38.7	2.0	0.39	ug/m³	41.0	<2.0	94.5	70-130			
n-Hexane	34.4	1.8	0.32	ug/m³	35.2	<1.8	97.5	70-130			
o-Xylene	40.1	0.87	0.25	ug/m³	43.4	<0.87	92.3	70-130			
Propylene	17.0	0.86	0.13	ug/m³	17.2	<0.86	98.6	70-130			
Styrene	42.6	2.1	0.37	ug/m³	42.6	<2.1	100	70-130			
Tetrachloroethene	64.6	3.4	0.59	ug/m³	67.8	<3.4	95.3	70-130			
Tetrahydrofuran	27.2	1.5	0.56	ug/m³	29.5	<1.5	92.3	70-130			
Toluene	36.1	0.75	0.28	ug/m³	37.7	<0.75	95.8	70-130			
trans-1,2-Dichloroethene	38.5	2.0	0.38	ug/m³	39.6	<2.0	97.2	70-130			
trans-1,3-Dichloropropene	44.6	2.3	0.54	ug/m³	45.4	<2.3	98.4	70-130			
Trichloroethene	52.0	1.1	0.49	ug/m³	53.7	<1.1	96.7	70-130			
Trichlorofluoromethane	56.5	2.8	0.20	ug/m³	56.2	<2.8	101	70-130			
Trichlorotrifluoroethane	74.5	3.8	0.21	ug/m³	76.6	<3.8	97.2	70-130			
Vinyl acetate	33.4	1.8	0.20	ug/m³	35.2	<1.8	95.0	70-130			
Vinyl chloride	25.6	0.51	0.14	ug/m³	25.6	<0.51	100	70-130			
LCS (B1K0514-BS2)					Prepared & Analyzed: 08/11/21						
1,1,1-Trichloroethane	58.1	2.7	0.54	ug/m³	54.6	<2.7	107	70-130			
1,1,2,2-Tetrachloroethane	67.9	3.4	0.82	ug/m³	68.6	<3.4	98.9	70-130			
1,1,2-Trichloroethane	55.8	2.7	0.65	ug/m³	54.6	<2.7	102	70-130			
1,1-Dichloroethane	37.3	2.0	0.29	ug/m³	40.5	<2.0	92.1	70-130			
1,1-Dichloroethene	36.4	2.0	0.34	ug/m³	39.6	<2.0	91.9	70-130			
1,2,4-Trichlorobenzene	76.3	3.7	0.82	ug/m³	74.2	<3.7	103	70-130			
1,2,4-Trimethylbenzene	49.9	0.98	0.24	ug/m³	49.2	<0.98	101	70-130			
1,2-Dibromoethane	77.6	3.8	0.53	ug/m³	76.8	<3.8	101	70-130			
1,2-Dichlorobenzene	60.7	3.0	0.37	ug/m³	60.1	<3.0	101	70-130			

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B1K0514 - TO-15											
LCS (B1K0514-BS2)					Prepared & Analyzed: 08/11/21						
1,2-Dichloroethane	43.9	2.0	0.69	ug/m³	40.5	<2.0	109	70-130			
1,2-Dichloropropane	47.6	2.3	0.69	ug/m³	46.2	<2.3	103	70-130			
1,3,5-Trimethylbenzene	47.4	0.98	0.27	ug/m³	49.2	<0.98	96.5	70-130			
1,3-Butadiene	22.1	1.1	0.29	ug/m³	22.1	<1.1	100	70-130			
1,3-Dichlorobenzene	66.2	3.0	0.44	ug/m³	60.1	<3.0	110	70-130			
1,4-Dichlorobenzene	68.2	3.0	0.44	ug/m³	60.1	<3.0	113	70-130			
2-Butanone	28.0	1.5	0.24	ug/m³	29.5	<1.5	94.8	70-130			
4-Ethyltoluene	51.7	2.5	0.49	ug/m³	49.2	<2.5	105	70-130			
Acetone	21.7	1.2	0.26	ug/m³	23.8	<1.2	91.5	70-130			
Benzene	31.6	0.64	0.29	ug/m³	31.9	<0.64	99.0	70-130			
Benzyl chloride	59.1	2.6	0.62	ug/m³	51.8	<2.6	114	70-130			
Bromodichloromethane	70.9	3.4	0.94	ug/m³	67.0	<3.4	106	70-130			
Bromoform	103	5.2	0.68	ug/m³	103	<5.2	99.4	70-130			
Bromomethane	34.4	1.9	0.10	ug/m³	38.8	<1.9	88.7	70-130			
Carbon disulfide	27.3	1.6	0.22	ug/m³	31.1	<1.6	87.8	70-130			
Carbon tetrachloride	66.8	3.1	0.59	ug/m³	62.9	<3.1	106	70-130			
Chlorobenzene	45.3	2.3	0.45	ug/m³	46.0	<2.3	98.4	70-130			
Chloroethane	23.7	1.3	0.18	ug/m³	26.4	<1.3	89.9	70-130			
Chloroform	50.4	2.4	0.63	ug/m³	48.8	<2.4	103	70-130			
Chloromethane	19.0	1.0	0.17	ug/m³	20.6	<1.0	91.9	70-130			
cis-1,2-Dichloroethene	34.9	2.0	0.27	ug/m³	39.6	<2.0	88.1	70-130			
cis-1,3-Dichloropropene	47.5	2.3	0.82	ug/m³	45.4	<2.3	105	70-130			
Cyclohexane	35.5	1.7	0.52	ug/m³	34.4	<1.7	103	70-130			
Dibromochloromethane	87.2	4.3	0.82	ug/m³	85.2	<4.3	102	70-130			
Dichlorodifluoromethane	49.5	2.5	0.19	ug/m³	49.5	<2.5	100	70-130			
Dichlorotetrafluoroethane	62.5	3.5	0.28	ug/m³	69.9	<3.5	89.4	70-130			
Ethanol	17.8	0.94	0.24	ug/m³	18.8	<0.94	94.2	70-130			
Ethyl acetate	32.0	1.8	0.40	ug/m³	36.0	<1.8	88.7	70-130			
Ethylbenzene	44.3	0.87	0.28	ug/m³	43.4	<0.87	102	70-130			
Hexachlorobutadiene	91.9	5.3	1.4	ug/m³	107	<5.3	86.2	70-130			
Isopropyl alcohol	23.1	1.2	0.20	ug/m³	24.6	<1.2	94.1	70-130			
m,p-Xylene	85.9	1.7	0.48	ug/m³	86.8	<1.7	98.9	70-130			
Methyl butyl ketone	41.3	2.0	0.49	ug/m³	41.0	<2.0	101	70-130			
Methyl isobutyl ketone	41.0	2.0	0.41	ug/m³	41.0	<2.0	100	70-130			
Methyl tert-butyl ether	32.0	1.8	0.19	ug/m³	36.1	<1.8	88.8	70-130			
Methylene chloride	27.2	1.7	0.76	ug/m³	34.7	<1.7	78.4	70-130			
Naphthalene	56.6	2.6	0.47	ug/m³	55.0	<2.6	103	70-130			
n-Heptane	42.5	2.0	0.39	ug/m³	41.0	<2.0	104	70-130			
n-Hexane	32.5	1.8	0.32	ug/m³	35.2	<1.8	92.1	70-130			

LEGEND Technical Services, Inc.

88 Empire Drive
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Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

VOC - AIR - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B1K0514 - TO-15											
LCS (B1K0514-BS2)					Prepared & Analyzed: 08/11/21						
o-Xylene	42.5	0.87	0.25	ug/m³	43.4	<0.87	97.9	70-130			
Propylene	16.3	0.86	0.13	ug/m³	17.2	<0.86	94.8	70-130			
Styrene	44.0	2.1	0.37	ug/m³	42.6	<2.1	103	70-130			
Tetrachloroethene	62.8	3.4	0.59	ug/m³	67.8	<3.4	92.5	70-130			
Tetrahydrofuran	30.6	1.5	0.56	ug/m³	29.5	<1.5	104	70-130			
Toluene	37.3	0.75	0.28	ug/m³	37.7	<0.75	98.9	70-130			
trans-1,2-Dichloroethene	34.2	2.0	0.38	ug/m³	39.6	<2.0	86.2	70-130			
trans-1,3-Dichloropropene	48.4	2.3	0.54	ug/m³	45.4	<2.3	107	70-130			
Trichloroethene	53.7	1.1	0.49	ug/m³	53.7	<1.1	99.9	70-130			
Trichlorofluoromethane	53.2	2.8	0.20	ug/m³	56.2	<2.8	94.7	70-130			
Trichlorotrifluoroethane	63.8	3.8	0.21	ug/m³	76.6	<3.8	83.3	70-130			
Vinyl acetate	32.4	1.8	0.20	ug/m³	35.2	<1.8	91.9	70-130			
Vinyl chloride	24.6	0.51	0.14	ug/m³	25.6	<0.51	96.3	70-130			

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #: 2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 11/08/21

TENTATIVELY IDENTIFIED COMPOUNDS - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B1J2038 - TO-15											
Blank (B1J2038-BLK1)					Prepared & Analyzed: 10/19/21						
Tentatively Identified Compounds	ND			ug/m³							A-02
Batch B1K0514 - TO-15											
Blank (B1K0514-BLK1)					Prepared & Analyzed: 06/04/21						
Tentatively Identified Compounds	ND			ug/m³							A-02
Blank (B1K0514-BLK2)					Prepared & Analyzed: 08/11/21						
Tentatively Identified Compounds	ND			ug/m³							A-02

LEGEND Technical Services, Inc.

88 Empire Drive
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Barr Engineering Co.	Project:	23692468		
325 South Lake Avenue, Suite 700	Project Number:	23692468.00 300 200	Work Order #:	2104671
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported:	11/08/21

Notes and Definitions

T4	Tentatively identified compound. Concentration is estimated and based on the closest internal standard.
A-02	No tentatively identified compounds (TICs) were present above 5.0 ppbv.
<	Less than value listed
dry	Sample results reported on a dry weight basis
NA	Not applicable. The %RPD is not calculated from values less than the reporting limit.
MDL	Method Detection Limit; Equivalent to the method LOD (Limit of Detection)
RL	Reporting Limit
RPD	Relative Percent Difference
LCS	Laboratory Control Spike = Blank Spike (BS) = Laboratory Fortified Blank (LFB)
MS	Matrix Spike = Laboratory Fortified Matrix (LFM)

Chain of Custody for Air Canisters

BARR ☐ Ann Arbor ☐ Bismarck ☒ Duluth ☐ Hibbing ☐ Jefferson City ☐ Minneapolis

Sample Origination State: ☐ KS ☐ MO ☐ WI ☐ MI ☐ ND Other: ☒ MN ☐ SD

Analysis Requested: ☐ TO-14 ☒ TO-15 ☐ TO-15SIM ☐ 3C ☐ Other

COC Number: № 51284

COC 1 of 1

REPORT TO	INVOICE TO
Company: Barr Engineering Co.	Company: Barr
Address: 325 S. Lake Ave	Address:
Name: Duluth, MN 55802	Name:
email: Ryan Ericksen rericksen@barr.com	email:
Copy to: datamgt@barr.com	P.O. —
Project Name: Wisdom phase II	Barr Project No: 23692468.00 300 200

Lab Deliverable Contents: (check all that apply)
☒ Sample Data with QC
☐ TIC Library Search
☐ Sample Chromatograms
☐ Individual Canister Certification Data
EDD: ☒ EQuIS ☐ EQuIS-LITE ☐ TIC results in EDD
Other:

Matrix Code:
AA = Ambient Air (Indoor/Outdoor)
SV = Soil Vapor/Landfill Gas/SVE
Other:

2104671

Location	Canister Serial #	Canister Size	Flow Controller Serial #	Vacuum Initial	Vacuum Final	Collection Date (mm/dd/yyyy)	Collection Time Start (hh:mm)	Collection Time Stop (hh:mm)	Total Time	Matrix Code	PID Reading (ppm/ppb)	Sample Comments
1. SS-1	00378	1L	1	28	3	10/11/2021	1109	1118	9min	SV	0.0	01 A
2. SS-2	00382	1L	69	28	3	10/11/2021	1247	1254	7min	SV	0.0	02
3. SS-3	00437	1L	50	27	3	10/11/2021	1340	1347	7min	SV	0.0	03
4.												
5.												
6.												
7.												
8.												
9.												
10.												

BARR USE ONLY

Sampled by: KMJS
Barr Proj. Manager: REE
Barr DQ Manager: JET
Lab Name: Legend
Lab Location: St. Paul, MN.

Relinquished by:	Date	Time	Received by:	Date	Time
Keith Mentz	10/11/21	1630		10/12/21	9:53
Relinquished by:	Date	Time	Received by:	Date	Time

Samples Shipped VIA: ☐ Courier ☐ Federal Express ☐ Sampler ☐ Other:

Air Bill Number:

Lab WO:

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; **Pink Copy:** Send to Data Management Administrators.

H:\RLG\STDFORMS\Chain Of Custody for Air Canisters Form 2015 RLG Rev. 06/16/15

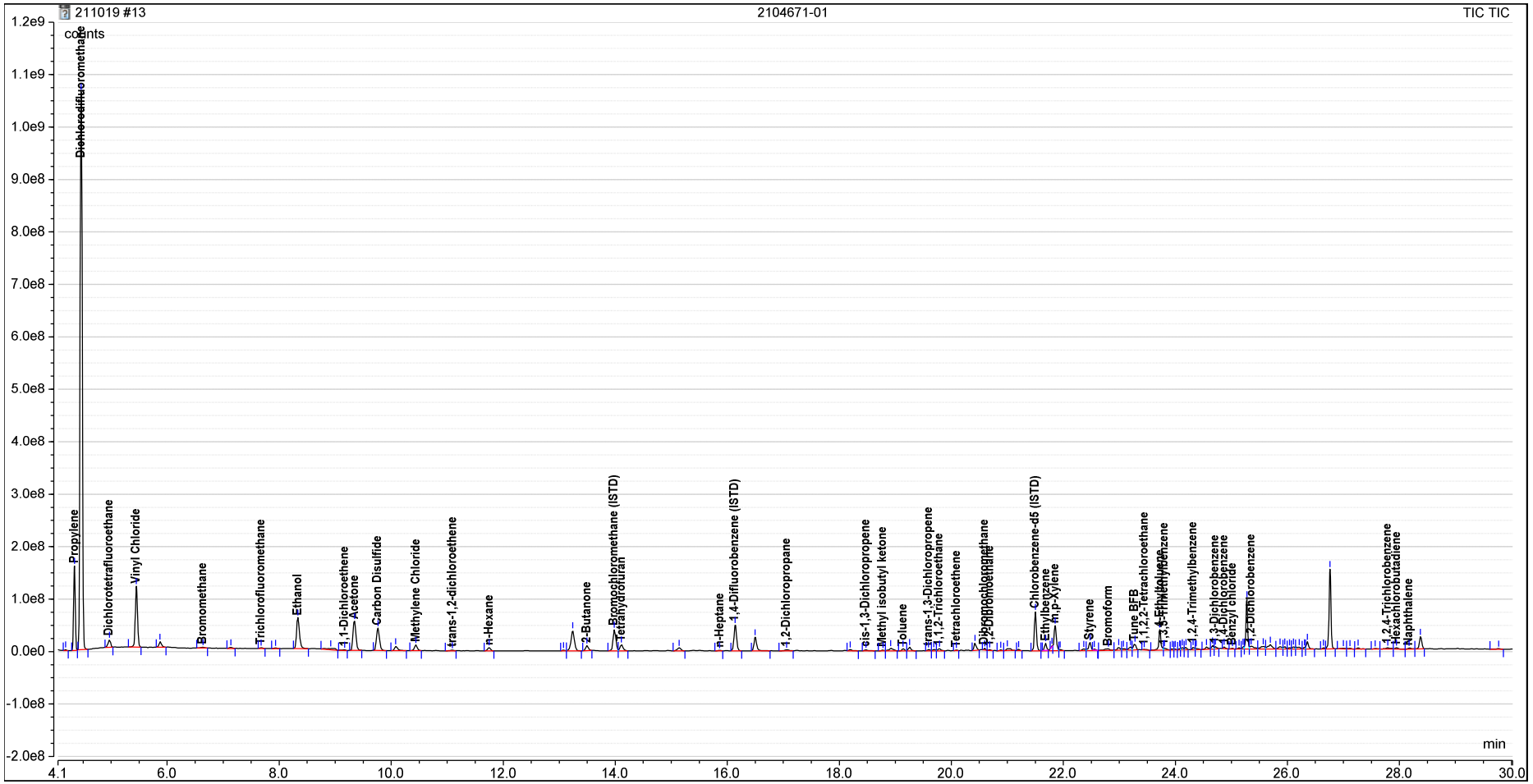
Quantitation Report

Sequence Details

Sequence Name:	**211019**	*Created On:*	**23/Jun/21 16:11:29**
Directory:	**GCMS6**	*Created By:*	**shang**
Data Vault:	**chromeleon2020**	*Updated On:*	**01/Nov/21 11:59:36**
No. of Injections:	**22**	*Updated By:*	**shang**
Calibration Source:	**211019**		

Injection Details

Injection Name:	**2104671-01**	*Injection Volume:*	**1.00**
Analysis Type:	**Field Sample**	*Dilution Factor:*	**1.0000**
Injection Type:	**Unknown**	*Vial Number:*	**1-3**
Injection Date/Time:	**19/Oct/21 21:57**	*Processing Method:*	**TO15-211019**
		Instrument Method:	**n.a.**



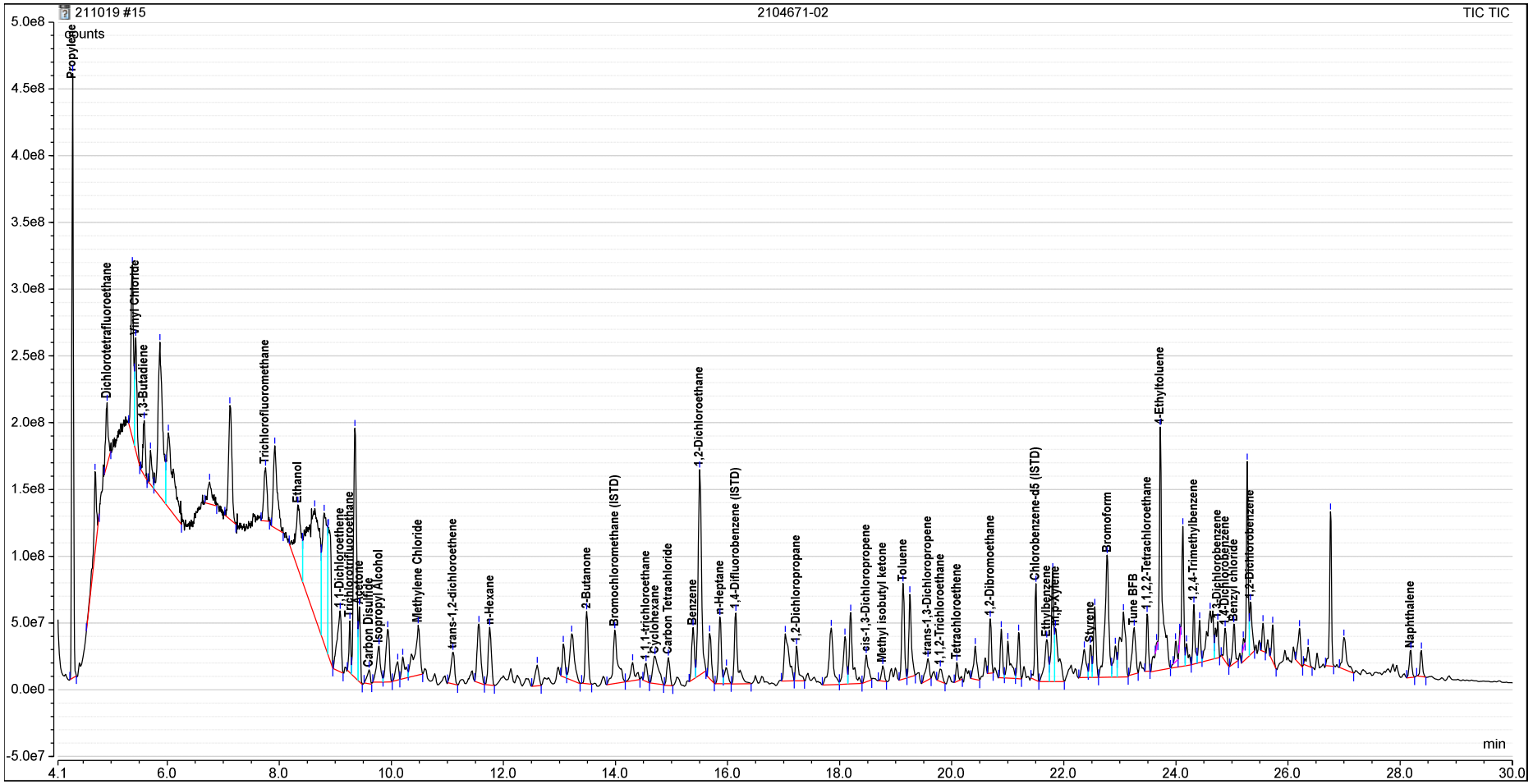
Quantitation Report

Sequence Details

Sequence Name:	**211019**	*Created On:*	**23/Jun/21 16:11:29**
Directory:	**GCMS6**	*Created By:*	**shang**
Data Vault:	**chromeleon2020**	*Updated On:*	**01/Nov/21 11:59:36**
No. of Injections:	**22**	*Updated By:*	**shang**
Calibration Source:	**211019**		

Injection Details

Injection Name:	**2104671-02**	*Injection Volume:*	**1.00**
Analysis Type:	**Field Sample**	*Dilution Factor:*	**1.0000**
Injection Type:	**Unknown**	*Vial Number:*	**1-4**
Injection Date/Time:	**20/Oct/21 00:04**	*Processing Method:*	**TO15-211019**
		Instrument Method:	**n.a.**



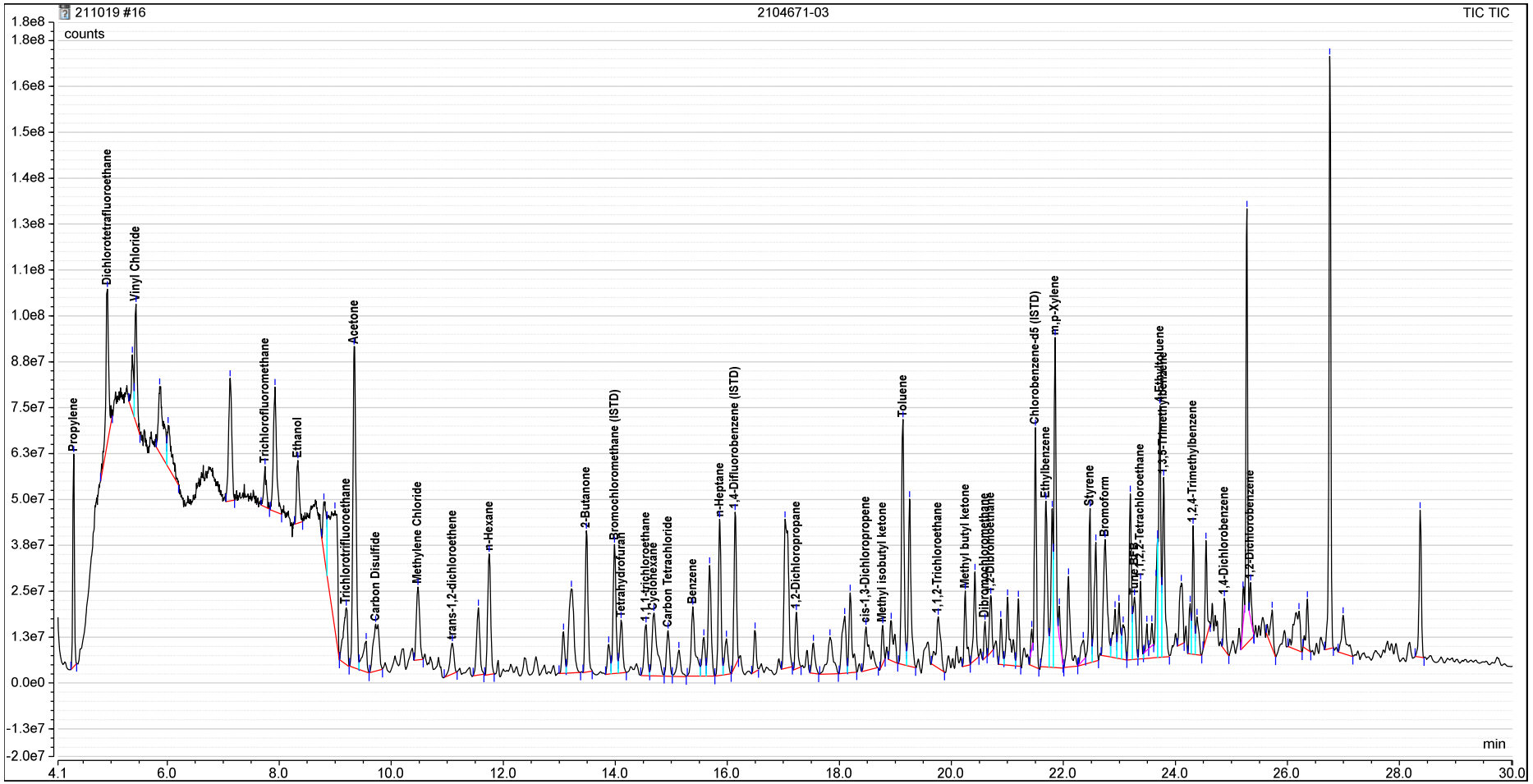
Quantitation Report

Sequence Details

Sequence Name:	**211019**	*Created On:*	**23/Jun/21 16:11:29**
Directory:	**GCMS6**	*Created By:*	**shang**
Data Vault:	**chromeleon2020**	*Updated On:*	**01/Nov/21 11:59:36**
No. of Injections:	**22**	*Updated By:*	**shang**
Calibration Source:	**211019**		

Injection Details

Injection Name:	**2104671-03**	*Injection Volume:*	**1.00**
Analysis Type:	**Field Sample**	*Dilution Factor:*	**1.0000**
Injection Type:	**Unknown**	*Vial Number:*	**1-5**
Injection Date/Time:	**20/Oct/21 01:07**	*Processing Method:*	**TO15-211019**
		Instrument Method:	**n.a.**



LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

December 17, 2021

Mr. James E. Taraldsen
Barr Engineering Co.
325 South Lake Avenue, Suite 700
Duluth, MN 55802

Work Order Number: 2105216
RE: 23692468

Enclosed are the results of analyses for samples received by the laboratory on 11/10/21. If you have any questions concerning this report, please feel free to contact me.

Results are not blank corrected unless noted within the report. Additionally, all QC results meet requirements unless noted.

The results in this report apply to the samples as received.

All samples will be retained by Legend Technical Services, Inc., unless consumed in the analysis, at ambient conditions for 30 days from the date of this report and then discarded unless other arrangements are made. All samples were received in acceptable condition unless otherwise noted.

All test results and QC meet requirements of the 2003 NELAC standard.

MDH (NELAP) Accreditation #027-123-295

Prepared by,
LEGEND TECHNICAL SERVICES, INC

Bach Pham
Client Manager II/Department Manager
bpham@legend-group.com

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468		
325 South Lake Avenue, Suite 700	Project Number:	23692468 300 200	Work Order #:	2105216
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported:	12/17/21

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B-1_14-14	2105216-01	Soil	11/08/21 15:20	11/10/21 09:48
B-2_14-14	2105216-02	Soil	11/08/21 15:25	11/10/21 09:48
B-3_14-14	2105216-03	Soil	11/08/21 15:45	11/10/21 09:48
B-4_14-14	2105216-04	Soil	11/08/21 15:50	11/10/21 09:48
B-5_14-14	2105216-05	Soil	11/08/21 16:20	11/10/21 09:48
B-6_14-14	2105216-06	Soil	11/08/21 16:25	11/10/21 09:48
B-7_6-6	2105216-07	Soil	11/09/21 12:10	11/10/21 09:48
B-8_6-6	2105216-08	Soil	11/09/21 12:30	11/10/21 09:48
B-9_6-6	2105216-09	Soil	11/09/21 12:45	11/10/21 09:48
B-10_7.5-7.5	2105216-10	Soil	11/09/21 13:25	11/10/21 09:48
B-11_7.5-7.5	2105216-11	Soil	11/09/21 13:45	11/10/21 09:48
M-1_14-14	2105216-12	Soil	11/08/21 00:00	11/10/21 09:48
Field Blank	2105216-13	Methanol	11/08/21 00:00	11/10/21 09:48
Trip Blank	2105216-14	Methanol	11/08/21 00:00	11/10/21 09:48

Shipping Container Information

Default Cooler Temperature (°C): 0.5

Received on ice: Yes
Temperature blank was present
Received on ice pack: No
Received on melt water: No
Ambient: No
Acceptable (IH/ISO only): No
Custody seals: No

Case Narrative:

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468 300 200	Work Order #: 2105216
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 12/17/21

DRO/8015D
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
B-1_14-14 (2105216-01) Soil Sampled: 11/08/21 15:20 Received: 11/10/21 9:48										
Diesel Range Organics	**6.0**	3.8	1.9	mg/kg dry	1	B1K1121	11/11/21	11/11/21	WI(95) DRO	
Surrogate: Triacontane (C-30)	*98.1*			*67.4-125 %*		"	"	"	"	
B-2_14-14 (2105216-02) Soil Sampled: 11/08/21 15:25 Received: 11/10/21 9:48										
Diesel Range Organics	<2.9	2.9	1.4	mg/kg dry	1	B1K1121	11/11/21	11/11/21	WI(95) DRO	
Surrogate: Triacontane (C-30)	*95.3*			*67.4-125 %*		"	"	"	"	
B-7_6-6 (2105216-07) Soil Sampled: 11/09/21 12:10 Received: 11/10/21 9:48										
Diesel Range Organics	<3.5	3.5	1.7	mg/kg dry	1	B1K1121	11/11/21	11/11/21	WI(95) DRO	
Surrogate: Triacontane (C-30)	*98.1*			*67.4-125 %*		"	"	"	"	
B-8_6-6 (2105216-08) Soil Sampled: 11/09/21 12:30 Received: 11/10/21 9:48										
Diesel Range Organics	<4.8	4.8	2.3	mg/kg dry	1	B1K1121	11/11/21	11/11/21	WI(95) DRO	
Surrogate: Triacontane (C-30)	*96.5*			*67.4-125 %*		"	"	"	"	
B-9_6-6 (2105216-09) Soil Sampled: 11/09/21 12:45 Received: 11/10/21 9:48										
Diesel Range Organics	**5.2**	5.0	2.4	mg/kg dry	1	B1K1121	11/11/21	11/11/21	WI(95) DRO	
Surrogate: Triacontane (C-30)	*100*			*67.4-125 %*		"	"	"	"	
B-10_7.5-7.5 (2105216-10) Soil Sampled: 11/09/21 13:25 Received: 11/10/21 9:48										
Diesel Range Organics	<6.2	6.2	3.0	mg/kg dry	1	B1K1121	11/11/21	11/11/21	WI(95) DRO	
Surrogate: Triacontane (C-30)	*105*			*67.4-125 %*		"	"	"	"	
B-11_7.5-7.5 (2105216-11) Soil Sampled: 11/09/21 13:45 Received: 11/10/21 9:48										
Diesel Range Organics	**8.1**	4.9	2.4	mg/kg dry	1	B1K1121	11/11/21	11/11/21	WI(95) DRO	
Surrogate: Triacontane (C-30)	*110*			*67.4-125 %*		"	"	"	"	
M-1_14-14 (2105216-12) Soil Sampled: 11/08/21 00:00 Received: 11/10/21 9:48										
Diesel Range Organics	<3.5	3.5	1.7	mg/kg dry	1	B1K1121	11/11/21	11/11/21	WI(95) DRO	
Surrogate: Triacontane (C-30)	*94.7*			*67.4-125 %*		"	"	"	"	

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468 300 200	Work Order #: 2105216
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 12/17/21

WI(95) GRO/8015D
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
B-3_14-14 (2105216-03) Soil Sampled: 11/08/21 15:45 Received: 11/10/21 9:48										
Gasoline range organics	<5.9	5.9	2.0	mg/kg dry	1	B1K1203	11/12/21	11/12/21	WI(95) GRO	
Surrogate: 4-Fluorochlorobenzene	*89.0*			*80-150 %*		"	"	"	"	
B-4_14-14 (2105216-04) Soil Sampled: 11/08/21 15:50 Received: 11/10/21 9:48										
Gasoline range organics	<6.2	6.2	2.1	mg/kg dry	1	B1K1203	11/12/21	11/13/21	WI(95) GRO	
Surrogate: 4-Fluorochlorobenzene	*90.2*			*80-150 %*		"	"	"	"	
B-5_14-14 (2105216-05) Soil Sampled: 11/08/21 16:20 Received: 11/10/21 9:48										
Gasoline range organics	<5.1	5.1	1.7	mg/kg dry	1	B1K1203	11/12/21	11/12/21	WI(95) GRO	
Surrogate: 4-Fluorochlorobenzene	*90.4*			*80-150 %*		"	"	"	"	
B-6_14-14 (2105216-06) Soil Sampled: 11/08/21 16:25 Received: 11/10/21 9:48										W-03
Gasoline range organics	<7.1	7.1	2.4	mg/kg dry	1	B1K1203	11/12/21	11/12/21	WI(95) GRO	
Surrogate: 4-Fluorochlorobenzene	*90.7*			*80-150 %*		"	"	"	"	
B-7_6-6 (2105216-07) Soil Sampled: 11/09/21 12:10 Received: 11/10/21 9:48										
Gasoline range organics	<5.6	5.6	1.9	mg/kg dry	1	B1K1203	11/12/21	11/12/21	WI(95) GRO	
Surrogate: 4-Fluorochlorobenzene	*89.8*			*80-150 %*		"	"	"	"	
B-8_6-6 (2105216-08) Soil Sampled: 11/09/21 12:30 Received: 11/10/21 9:48										
Gasoline range organics	<5.3	5.3	1.8	mg/kg dry	1	B1K1203	11/12/21	11/12/21	WI(95) GRO	
Surrogate: 4-Fluorochlorobenzene	*89.0*			*80-150 %*		"	"	"	"	
B-9_6-6 (2105216-09) Soil Sampled: 11/09/21 12:45 Received: 11/10/21 9:48										
Gasoline range organics	<5.2	5.2	1.8	mg/kg dry	1	B1K1203	11/12/21	11/12/21	WI(95) GRO	
Surrogate: 4-Fluorochlorobenzene	*90.3*			*80-150 %*		"	"	"	"	
B-10_7.5-7.5 (2105216-10) Soil Sampled: 11/09/21 13:25 Received: 11/10/21 9:48										
Gasoline range organics	<5.7	5.7	1.9	mg/kg dry	1	B1K1203	11/12/21	11/13/21	WI(95) GRO	
Surrogate: 4-Fluorochlorobenzene	*89.5*			*80-150 %*		"	"	"	"	
B-11_7.5-7.5 (2105216-11) Soil Sampled: 11/09/21 13:45 Received: 11/10/21 9:48										
Gasoline range organics	<5.6	5.6	1.9	mg/kg dry	1	B1K1203	11/12/21	11/13/21	WI(95) GRO	
Surrogate: 4-Fluorochlorobenzene	*86.7*			*80-150 %*		"	"	"	"	
Field Blank (2105216-13) Methanol Sampled: 11/08/21 00:00 Received: 11/10/21 9:48										
Gasoline range organics	<5.0	5.0	1.7	mg/kg wet	1	B1K1203	11/12/21	11/12/21	WI(95) GRO	
Surrogate: 4-Fluorochlorobenzene	*87.4*			*80-150 %*		"	"	"	"	
Trip Blank (2105216-14) Methanol Sampled: 11/08/21 00:00 Received: 11/10/21 9:48										
Gasoline range organics	<5.0	5.0	1.7	mg/kg wet	1	B1K1203	11/12/21	11/12/21	WI(95) GRO	
Surrogate: 4-Fluorochlorobenzene	*90.5*			*80-150 %*		"	"	"	"	

LEGEND Technical Services, Inc.

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Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468 300 200	Work Order #: 2105216
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 12/17/21

PERCENT SOLIDS
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
B-1_14-14 (2105216-01) Soil Sampled: 11/08/21 15:20 Received: 11/10/21 9:48										
% Solids	**96**			%	1	B1K1641	11/16/21	11/18/21	% calculation	
B-2_14-14 (2105216-02) Soil Sampled: 11/08/21 15:25 Received: 11/10/21 9:48										
% Solids	**98**			%	1	B1K1641	11/16/21	11/18/21	% calculation	
B-3_14-14 (2105216-03) Soil Sampled: 11/08/21 15:45 Received: 11/10/21 9:48										
% Solids	**97**			%	1	B1K1641	11/16/21	11/18/21	% calculation	
B-4_14-14 (2105216-04) Soil Sampled: 11/08/21 15:50 Received: 11/10/21 9:48										
% Solids	**96**			%	1	B1K1641	11/16/21	11/18/21	% calculation	
B-5_14-14 (2105216-05) Soil Sampled: 11/08/21 16:20 Received: 11/10/21 9:48										
% Solids	**98**			%	1	B1K1641	11/16/21	11/18/21	% calculation	
B-6_14-14 (2105216-06) Soil Sampled: 11/08/21 16:25 Received: 11/10/21 9:48										
% Solids	**98**			%	1	B1K1641	11/16/21	11/18/21	% calculation	
B-7_6-6 (2105216-07) Soil Sampled: 11/09/21 12:10 Received: 11/10/21 9:48										
% Solids	**89**			%	1	B1K1641	11/16/21	11/18/21	% calculation	
B-8_6-6 (2105216-08) Soil Sampled: 11/09/21 12:30 Received: 11/10/21 9:48										
% Solids	**94**			%	1	B1K1641	11/16/21	11/18/21	% calculation	
B-9_6-6 (2105216-09) Soil Sampled: 11/09/21 12:45 Received: 11/10/21 9:48										
% Solids	**89**			%	1	B1K1641	11/16/21	11/18/21	% calculation	
B-10_7.5-7.5 (2105216-10) Soil Sampled: 11/09/21 13:25 Received: 11/10/21 9:48										
% Solids	**95**			%	1	B1K1641	11/16/21	11/18/21	% calculation	
B-11_7.5-7.5 (2105216-11) Soil Sampled: 11/09/21 13:45 Received: 11/10/21 9:48										
% Solids	**90**			%	1	B1K1641	11/16/21	11/18/21	% calculation	
M-1_14-14 (2105216-12) Soil Sampled: 11/08/21 00:00 Received: 11/10/21 9:48										
% Solids	**97**			%	1	B1K1641	11/16/21	11/18/21	% calculation	

LEGEND Technical Services, Inc.

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Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468 300 200	Work Order #: 2105216
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 12/17/21

VOC 8260D
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
B-1_14-14 (2105216-01) Soil Sampled: 11/08/21 15:20 Received: 11/10/21 9:48										
Benzene	<0.23	0.23	0.023	mg/kg dry	1	B1K1638	11/16/21	11/16/21	EPA 8260D	
Ethylbenzene	<0.23	0.23	0.052	mg/kg dry	1	"	"	"	"	
m,p-Xylene	<0.46	0.46	0.088	mg/kg dry	1	"	"	"	"	
o-Xylene	<0.23	0.23	0.057	mg/kg dry	1	"	"	"	"	
Toluene	<0.23	0.23	0.037	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	*97.5*			*76.4-120 %*		"	"	"	"	
Surrogate: Dibromofluoromethane	*99.4*			*76.2-120 %*		"	"	"	"	
Surrogate: Toluene-d8	*102*			*77.2-120 %*		"	"	"	"	
B-2_14-14 (2105216-02) Soil Sampled: 11/08/21 15:25 Received: 11/10/21 9:48										
Benzene	<0.22	0.22	0.022	mg/kg dry	1	B1K1638	11/16/21	11/16/21	EPA 8260D	
Ethylbenzene	<0.22	0.22	0.050	mg/kg dry	1	"	"	"	"	
m,p-Xylene	<0.44	0.44	0.086	mg/kg dry	1	"	"	"	"	
o-Xylene	<0.22	0.22	0.056	mg/kg dry	1	"	"	"	"	
Toluene	<0.22	0.22	0.036	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	*101*			*76.4-120 %*		"	"	"	"	
Surrogate: Dibromofluoromethane	*97.9*			*76.2-120 %*		"	"	"	"	
Surrogate: Toluene-d8	*98.4*			*77.2-120 %*		"	"	"	"	
B-3_14-14 (2105216-03) Soil Sampled: 11/08/21 15:45 Received: 11/10/21 9:48										
Benzene	<0.24	0.24	0.024	mg/kg dry	1	B1K1638	11/16/21	11/16/21	EPA 8260D	
Ethylbenzene	<0.24	0.24	0.053	mg/kg dry	1	"	"	"	"	
m,p-Xylene	<0.47	0.47	0.091	mg/kg dry	1	"	"	"	"	
o-Xylene	<0.24	0.24	0.059	mg/kg dry	1	"	"	"	"	
Toluene	<0.24	0.24	0.038	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	*102*			*76.4-120 %*		"	"	"	"	
Surrogate: Dibromofluoromethane	*98.0*			*76.2-120 %*		"	"	"	"	
Surrogate: Toluene-d8	*97.3*			*77.2-120 %*		"	"	"	"	
B-4_14-14 (2105216-04) Soil Sampled: 11/08/21 15:50 Received: 11/10/21 9:48										
Benzene	<0.24	0.24	0.024	mg/kg dry	1	B1K1638	11/16/21	11/16/21	EPA 8260D	
Ethylbenzene	<0.24	0.24	0.054	mg/kg dry	1	"	"	"	"	
m,p-Xylene	<0.48	0.48	0.093	mg/kg dry	1	"	"	"	"	
o-Xylene	<0.24	0.24	0.060	mg/kg dry	1	"	"	"	"	
Toluene	<0.24	0.24	0.039	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	*100*			*76.4-120 %*		"	"	"	"	
Surrogate: Dibromofluoromethane	*98.9*			*76.2-120 %*		"	"	"	"	
Surrogate: Toluene-d8	*96.6*			*77.2-120 %*		"	"	"	"	
B-5_14-14 (2105216-05) Soil Sampled: 11/08/21 16:20 Received: 11/10/21 9:48										
Benzene	<0.30	0.30	0.030	mg/kg dry	1	B1K1638	11/16/21	11/16/21	EPA 8260D	
Ethylbenzene	<0.30	0.30	0.067	mg/kg dry	1	"	"	"	"	
m,p-Xylene	<0.60	0.60	0.12	mg/kg dry	1	"	"	"	"	

LEGEND Technical Services, Inc.

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Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468 300 200	Work Order #: 2105216
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 12/17/21

VOC 8260D
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
B-5_14-14 (2105216-05) Soil Sampled: 11/08/21 16:20 Received: 11/10/21 9:48										
o-Xylene	<0.30	0.30	0.075	mg/kg dry	1	B1K1638	11/16/21	11/16/21	EPA 8260D	
Toluene	<0.30	0.30	0.048	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	*98.7*			*76.4-120 %*		"	"	"	"	
Surrogate: Dibromofluoromethane	*98.7*			*76.2-120 %*		"	"	"	"	
Surrogate: Toluene-d8	*96.3*			*77.2-120 %*		"	"	"	"	
B-6_14-14 (2105216-06) Soil Sampled: 11/08/21 16:25 Received: 11/10/21 9:48										
Benzene	<0.32	0.32	0.032	mg/kg dry	1	B1K1638	11/16/21	11/16/21	EPA 8260D	
Ethylbenzene	<0.32	0.32	0.073	mg/kg dry	1	"	"	"	"	
m,p-Xylene	<0.65	0.65	0.13	mg/kg dry	1	"	"	"	"	
o-Xylene	<0.32	0.32	0.081	mg/kg dry	1	"	"	"	"	
Toluene	<0.32	0.32	0.052	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	*100*			*76.4-120 %*		"	"	"	"	
Surrogate: Dibromofluoromethane	*97.0*			*76.2-120 %*		"	"	"	"	
Surrogate: Toluene-d8	*95.6*			*77.2-120 %*		"	"	"	"	
B-7_6-6 (2105216-07) Soil Sampled: 11/09/21 12:10 Received: 11/10/21 9:48										
Benzene	<0.22	0.22	0.022	mg/kg dry	1	B1K1638	11/16/21	11/16/21	EPA 8260D	
Ethylbenzene	<0.22	0.22	0.051	mg/kg dry	1	"	"	"	"	
m,p-Xylene	<0.45	0.45	0.087	mg/kg dry	1	"	"	"	"	
o-Xylene	<0.22	0.22	0.056	mg/kg dry	1	"	"	"	"	
Toluene	<0.22	0.22	0.036	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	*97.2*			*76.4-120 %*		"	"	"	"	
Surrogate: Dibromofluoromethane	*98.0*			*76.2-120 %*		"	"	"	"	
Surrogate: Toluene-d8	*97.2*			*77.2-120 %*		"	"	"	"	
B-8_6-6 (2105216-08) Soil Sampled: 11/09/21 12:30 Received: 11/10/21 9:48										
Benzene	<0.25	0.25	0.025	mg/kg dry	1	B1K1638	11/16/21	11/16/21	EPA 8260D	
Ethylbenzene	<0.25	0.25	0.055	mg/kg dry	1	"	"	"	"	
m,p-Xylene	<0.49	0.49	0.094	mg/kg dry	1	"	"	"	"	
o-Xylene	<0.25	0.25	0.061	mg/kg dry	1	"	"	"	"	
Toluene	<0.25	0.25	0.039	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	*98.3*			*76.4-120 %*		"	"	"	"	
Surrogate: Dibromofluoromethane	*97.7*			*76.2-120 %*		"	"	"	"	
Surrogate: Toluene-d8	*98.8*			*77.2-120 %*		"	"	"	"	
B-9_6-6 (2105216-09) Soil Sampled: 11/09/21 12:45 Received: 11/10/21 9:48										
Benzene	<0.21	0.21	0.021	mg/kg dry	1	B1K2116	11/20/21	11/20/21	EPA 8260D	
Ethylbenzene	<0.21	0.21	0.048	mg/kg dry	1	"	"	"	"	
m,p-Xylene	<0.43	0.43	0.082	mg/kg dry	1	"	"	"	"	
o-Xylene	<0.21	0.21	0.053	mg/kg dry	1	"	"	"	"	
Toluene	<0.21	0.21	0.034	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	*102*			*76.4-120 %*		"	"	"	"	

LEGEND Technical Services, Inc.

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Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468 300 200	Work Order #: 2105216
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 12/17/21

VOC 8260D
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
B-9_6-6 (2105216-09) Soil Sampled: 11/09/21 12:45 Received: 11/10/21 9:48										
Surrogate: Dibromofluoromethane	*107*			*76.2-120 %*		*B1K2116*	*11/20/21*	*11/20/21*	*EPA 8260D*	
Surrogate: Toluene-d8	*102*			*77.2-120 %*		"	"	"	"	
B-10_7.5-7.5 (2105216-10) Soil Sampled: 11/09/21 13:25 Received: 11/10/21 9:48										
Benzene	<0.22	0.22	0.022	mg/kg dry	1	B1K2116	11/20/21	11/21/21	EPA 8260D	
Ethylbenzene	<0.22	0.22	0.050	mg/kg dry	1	"	"	"	"	
m,p-Xylene	<0.45	0.45	0.086	mg/kg dry	1	"	"	"	"	
o-Xylene	<0.22	0.22	0.056	mg/kg dry	1	"	"	"	"	
Toluene	<0.22	0.22	0.036	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	*101*			*76.4-120 %*		"	"	"	"	
Surrogate: Dibromofluoromethane	*103*			*76.2-120 %*		"	"	"	"	
Surrogate: Toluene-d8	*99.6*			*77.2-120 %*		"	"	"	"	
B-11_7.5-7.5 (2105216-11) Soil Sampled: 11/09/21 13:45 Received: 11/10/21 9:48										
Benzene	<0.22	0.22	0.022	mg/kg dry	1	B1K2116	11/20/21	11/21/21	EPA 8260D	
Ethylbenzene	<0.22	0.22	0.050	mg/kg dry	1	"	"	"	"	
m,p-Xylene	<0.44	0.44	0.086	mg/kg dry	1	"	"	"	"	
o-Xylene	<0.22	0.22	0.056	mg/kg dry	1	"	"	"	"	
Toluene	<0.22	0.22	0.036	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	*102*			*76.4-120 %*		"	"	"	"	
Surrogate: Dibromofluoromethane	*105*			*76.2-120 %*		"	"	"	"	
Surrogate: Toluene-d8	*103*			*77.2-120 %*		"	"	"	"	
M-1_14-14 (2105216-12) Soil Sampled: 11/08/21 00:00 Received: 11/10/21 9:48										
Benzene	<0.24	0.24	0.024	mg/kg dry	1	B1K2116	11/20/21	11/21/21	EPA 8260D	
Ethylbenzene	<0.24	0.24	0.054	mg/kg dry	1	"	"	"	"	
m,p-Xylene	<0.48	0.48	0.093	mg/kg dry	1	"	"	"	"	
o-Xylene	<0.24	0.24	0.060	mg/kg dry	1	"	"	"	"	
Toluene	<0.24	0.24	0.038	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	*100*			*76.4-120 %*		"	"	"	"	
Surrogate: Dibromofluoromethane	*108*			*76.2-120 %*		"	"	"	"	
Surrogate: Toluene-d8	*99.9*			*77.2-120 %*		"	"	"	"	
Field Blank (2105216-13) Methanol Sampled: 11/08/21 00:00 Received: 11/10/21 9:48										
Benzene	<0.20	0.20	0.020	mg/kg wet	1	B1K2116	11/20/21	11/21/21	EPA 8260D	
Ethylbenzene	<0.20	0.20	0.045	mg/kg wet	1	"	"	"	"	
m,p-Xylene	<0.40	0.40	0.077	mg/kg wet	1	"	"	"	"	
o-Xylene	<0.20	0.20	0.050	mg/kg wet	1	"	"	"	"	
Toluene	<0.20	0.20	0.032	mg/kg wet	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	*99.6*			*76.4-120 %*		"	"	"	"	
Surrogate: Dibromofluoromethane	*103*			*76.2-120 %*		"	"	"	"	
Surrogate: Toluene-d8	*99.6*			*77.2-120 %*		"	"	"	"	

LEGEND Technical Services, Inc.

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Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468 300 200	Work Order #: 2105216
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 12/17/21

VOC 8260D

Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Trip Blank (2105216-14) Methanol Sampled: 11/08/21 00:00 Received: 11/10/21 9:48										
Benzene	<0.20	0.20	0.020	mg/kg wet	1	B1K2116	11/20/21	11/21/21	EPA 8260D	
Ethylbenzene	<0.20	0.20	0.045	mg/kg wet	1	"	"	"	"	
m,p-Xylene	<0.40	0.40	0.077	mg/kg wet	1	"	"	"	"	
o-Xylene	<0.20	0.20	0.050	mg/kg wet	1	"	"	"	"	
Toluene	<0.20	0.20	0.032	mg/kg wet	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	*102*			*76.4-120 %*		"	"	"	"	
Surrogate: Dibromofluoromethane	*105*			*76.2-120 %*		"	"	"	"	
Surrogate: Toluene-d8	*101*			*77.2-120 %*		"	"	"	"	

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Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468 300 200	Work Order #: 2105216
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 12/17/21

DRO/8015D - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B1K1121 - Sonication (Wisc DRO)											
Blank (B1K1121-BLK1)					Prepared & Analyzed: 11/11/21						
Diesel Range Organics	< 8.0	8.0	3.9	mg/kg wet							
Surrogate: Triacontane (C-30)	*14.8*			*mg/kg wet*	*16.0*		*92.7*	*67.4-125*			
LCS (B1K1121-BS1)					Prepared & Analyzed: 11/11/21						
Diesel Range Organics	69.6	8.0	3.9	mg/kg wet		<8.0		70-120			
Surrogate: Triacontane (C-30)	*15.7*			*mg/kg wet*	*16.0*		*98.2*	*67.4-125*			
LCS Dup (B1K1121-BSD1)					Prepared: 11/11/21 Analyzed: 11/12/21						
Diesel Range Organics	65.8	8.0	3.9	mg/kg wet		<8.0		70-120	5.48	20	
Surrogate: Triacontane (C-30)	*16.1*			*mg/kg wet*	*16.0*		*101*	*67.4-125*			

LEGEND Technical Services, Inc.

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Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468 300 200	Work Order #: 2105216
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 12/17/21

WI(95) GRO/8015D - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B1K1203 - EPA 5035A Soil (Purge and Trap)											
Blank (B1K1203-BLK1)					Prepared & Analyzed: 11/12/21						
Gasoline range organics	< 5.0	5.0	1.7	mg/kg wet							
Surrogate: 4-Fluorochlorobenzene	*18.3*			*ug/L*	*20.0*		*91.4*	*80-150*			
LCS (B1K1203-BS1)					Prepared & Analyzed: 11/12/21						
Gasoline range organics	915			ug/L	1000		91.5	80-120			
Surrogate: 4-Fluorochlorobenzene	*18.8*			*ug/L*	*20.0*		*94.0*	*80-150*			
LCS Dup (B1K1203-BSD1)					Prepared: 11/12/21 Analyzed: 11/13/21						
Gasoline range organics	978			ug/L	1000		97.8	80-120	6.65	20	
Surrogate: 4-Fluorochlorobenzene	*18.9*			*ug/L*	*20.0*		*94.6*	*80-150*			
Duplicate (B1K1203-DUP1)		**Source: 2105220-01**			Prepared & Analyzed: 11/12/21						
Gasoline range organics	< 6.0	6.0	2.0	mg/kg dry		<6.0			NA	20	
Surrogate: 4-Fluorochlorobenzene	*17.6*			*ug/L*	*20.0*		*87.9*	*80-150*			

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Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468 300 200	Work Order #: 2105216
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 12/17/21

PERCENT SOLIDS - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B1K1641 - General Preparation											
Duplicate (B1K1641-DUP1)		**Source: 2105216-01**			Prepared: 11/16/21 Analyzed: 11/18/21						
% Solids	97.0			%		96.0			1.04	20	
Duplicate (B1K1641-DUP2)		**Source: 2105271-01**			Prepared: 11/16/21 Analyzed: 11/18/21						
% Solids	87.0			%		87.0			0.00	20	

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Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 12/17/21

VOC 8260D - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B1K1638 - EPA 5035A Soil (Purge and Trap)											
Blank (B1K1638-BLK1)					Prepared & Analyzed: 11/16/21						
Benzene	< 0.20	0.20	0.020	mg/kg wet							
Ethylbenzene	< 0.20	0.20	0.045	mg/kg wet							
m,p-Xylene	< 0.40	0.40	0.077	mg/kg wet							
o-Xylene	< 0.20	0.20	0.050	mg/kg wet							
Toluene	< 0.20	0.20	0.032	mg/kg wet							
Surrogate: 4-Bromofluorobenzene	*44.1*			*ug/L*	*44.9*		*98.3*	*76.4-120*			
Surrogate: Dibromofluoromethane	*44.8*			*ug/L*	*44.9*		*99.7*	*76.2-120*			
Surrogate: Toluene-d8	*45.1*			*ug/L*	*44.9*		*100*	*77.2-120*			
LCS (B1K1638-BS1)					Prepared & Analyzed: 11/16/21						
Benzene	47.6			ug/L	47.0		101	80-120			
Ethylbenzene	48.5			ug/L	47.0		103	80-120			
m,p-Xylene	96.0			ug/L	94.1		102	80-120			
o-Xylene	47.8			ug/L	47.0		102	80-120			
Toluene	48.2			ug/L	47.0		102	80-120			
Surrogate: 4-Bromofluorobenzene	*44.5*			*ug/L*	*44.9*		*99.2*	*76.4-120*			
Surrogate: Dibromofluoromethane	*45.7*			*ug/L*	*44.9*		*102*	*76.2-120*			
Surrogate: Toluene-d8	*45.3*			*ug/L*	*44.9*		*101*	*77.2-120*			
Matrix Spike (B1K1638-MS1)		**Source: 2105216-01**			Prepared & Analyzed: 11/16/21						
Benzene	46.5			ug/L	47.0	0.00	98.9	80-120			
Ethylbenzene	47.3			ug/L	47.0	0.00	101	80-121			
m,p-Xylene	93.3			ug/L	94.1	0.00	99.1	80-120			
o-Xylene	46.2			ug/L	47.0	0.00	98.3	80-120			
Toluene	46.5			ug/L	47.0	0.00	98.9	80-120			
Surrogate: 4-Bromofluorobenzene	*43.4*			*ug/L*	*44.9*		*96.6*	*76.4-120*			
Surrogate: Dibromofluoromethane	*43.9*			*ug/L*	*44.9*		*97.8*	*76.2-120*			
Surrogate: Toluene-d8	*44.6*			*ug/L*	*44.9*		*99.2*	*77.2-120*			
Matrix Spike Dup (B1K1638-MSD1)		**Source: 2105216-01**			Prepared & Analyzed: 11/16/21						
Benzene	45.4			ug/L	47.0	0.00	96.7	80-120	2.28	20	
Ethylbenzene	46.8			ug/L	47.0	0.00	99.6	80-121	1.08	20	
m,p-Xylene	92.3			ug/L	94.1	0.00	98.1	80-120	1.09	20	
o-Xylene	46.4			ug/L	47.0	0.00	98.6	80-120	0.347	20	
Toluene	46.1			ug/L	47.0	0.00	98.1	80-120	0.840	20	
Surrogate: 4-Bromofluorobenzene	*43.4*			*ug/L*	*44.9*		*96.8*	*76.4-120*			
Surrogate: Dibromofluoromethane	*43.6*			*ug/L*	*44.9*		*97.1*	*76.2-120*			
Surrogate: Toluene-d8	*44.6*			*ug/L*	*44.9*		*99.3*	*77.2-120*			

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Barr Engineering Co.	Project:	23692468	
325 South Lake Avenue, Suite 700	Project Number:	23692468 300 200	Work Order #: 2105216
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported: 12/17/21

VOC 8260D - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B1K2116 - EPA 5035A Soil (Purge and Trap)											
Blank (B1K2116-BLK1)					Prepared & Analyzed: 11/20/21						
Benzene	< 0.20	0.20	0.020	mg/kg wet							
Ethylbenzene	< 0.20	0.20	0.045	mg/kg wet							
m,p-Xylene	< 0.40	0.40	0.077	mg/kg wet							
o-Xylene	< 0.20	0.20	0.050	mg/kg wet							
Toluene	< 0.20	0.20	0.032	mg/kg wet							
Surrogate: 4-Bromofluorobenzene	*46.1*			*ug/L*	*44.9*		*103*	*76.4-120*			
Surrogate: Dibromofluoromethane	*47.3*			*ug/L*	*44.9*		*105*	*76.2-120*			
Surrogate: Toluene-d8	*45.8*			*ug/L*	*44.9*		*102*	*77.2-120*			
LCS (B1K2116-BS1)					Prepared & Analyzed: 11/20/21						
Benzene	47.7			ug/L	47.0		102	80-120			
Ethylbenzene	49.3			ug/L	47.0		105	80-120			
m,p-Xylene	98.3			ug/L	94.1		104	80-120			
o-Xylene	48.6			ug/L	47.0		103	80-120			
Toluene	48.6			ug/L	47.0		103	80-120			
Surrogate: 4-Bromofluorobenzene	*44.7*			*ug/L*	*44.9*		*99.5*	*76.4-120*			
Surrogate: Dibromofluoromethane	*47.9*			*ug/L*	*44.9*		*107*	*76.2-120*			
Surrogate: Toluene-d8	*48.2*			*ug/L*	*44.9*		*107*	*77.2-120*			
Matrix Spike (B1K2116-MS1)		**Source: 2105216-09**			Prepared & Analyzed: 11/20/21						
Benzene	46.4			ug/L	47.0	0.00	98.7	80-120			
Ethylbenzene	48.3			ug/L	47.0	0.00	103	80-121			
m,p-Xylene	95.2			ug/L	94.1	0.00	101	80-120			
o-Xylene	47.8			ug/L	47.0	0.00	102	80-120			
Toluene	47.6			ug/L	47.0	0.00	101	80-120			
Surrogate: 4-Bromofluorobenzene	*42.9*			*ug/L*	*44.9*		*95.5*	*76.4-120*			
Surrogate: Dibromofluoromethane	*45.2*			*ug/L*	*44.9*		*101*	*76.2-120*			
Surrogate: Toluene-d8	*46.7*			*ug/L*	*44.9*		*104*	*77.2-120*			
Matrix Spike Dup (B1K2116-MSD1)		**Source: 2105216-09**			Prepared: 11/20/21 Analyzed: 11/21/21						
Benzene	46.8			ug/L	47.0	0.00	99.6	80-120	0.863	20	
Ethylbenzene	48.4			ug/L	47.0	0.00	103	80-121	0.112	20	
m,p-Xylene	94.6			ug/L	94.1	0.00	100	80-120	0.671	20	
o-Xylene	47.3			ug/L	47.0	0.00	101	80-120	0.982	20	
Toluene	47.9			ug/L	47.0	0.00	102	80-120	0.730	20	
Surrogate: 4-Bromofluorobenzene	*42.7*			*ug/L*	*44.9*		*95.2*	*76.4-120*			
Surrogate: Dibromofluoromethane	*44.9*			*ug/L*	*44.9*		*100*	*76.2-120*			
Surrogate: Toluene-d8	*45.8*			*ug/L*	*44.9*		*102*	*77.2-120*			

LEGEND Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150

Barr Engineering Co.	Project:	23692468		
325 South Lake Avenue, Suite 700	Project Number:	23692468 300 200	Work Order #:	2105216
Duluth, MN 55802	Project Manager:	Mr. James E. Taraldsen	Date Reported:	12/17/21

Notes and Definitions

W-03	The initial sample weight was less than 8.0 grams.
<	Less than value listed
dry	Sample results reported on a dry weight basis
NA	Not applicable. The %RPD is not calculated from values less than the reporting limit.
MDL	Method Detection Limit; Equivalent to the method LOD (Limit of Detection)
RL	Reporting Limit
RPD	Relative Percent Difference
LCS	Laboratory Control Spike = Blank Spike (BS) = Laboratory Fortified Blank (LFB)
MS	Matrix Spike = Laboratory Fortified Matrix (LFM)

Barr Engineering Co. Chain of Custody 2105216

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

COC Number: № 591032
COC 1 of 2

REPORT TO	INVOICE TO
Company: Barr Engineering Co.	Company: Barr
Address: 325 S. Lake Ave	Address:
Address: Duluth, MN 55802	Address:
Name: Ryan Erickson	Name:
email: rerickson@barr.com	email:
Copy to: BarrDM@barr.com	P.O. —
Project Name: Woodland phase II	Barr Project No: 23692468 300 200

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	Soil: BTEX 8260	Soil: DRO WI method	Soil: GRO WI method	Soil: % Solids
										F	F	F	F
										N	N	N	N
1. B-1	14	14	ft	11/08/2021	1520	S	N	4	01 A-D	X	X		X
2. B-2	14	14	ft		1525	S	N	4	02 ↓	X	X		X
3. B-3	14	14	ft		1545	S	N	3	03 A-C	X		X	X
4. B-4	14	14	ft		1550	S	N	3	04	X		X	X
5. B-5	14	14	ft		1620	S	N	3	05	X		X	X
6. B-6	14	14	ft	↓	1625	S	N	3	06 ↓	X		X	X
7. B-7	6	6	ft	11/09/2021	1210	S	N	4	07 A-D	X	X	X	X
8. B-8	6	6	ft		1230	S	N	4	08	X	X	X	X
9. B-9	6	6	ft		1245	S	N	4	09	X	X	X	X
10. B-10	7.5	7.5	ft	↓	1325	S	N	4	10 ↓	X	X	X	X

Preservative Code
Field Filtered Y/N

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

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

BARR USE ONLY
Sampled by: KMTJ
Barr Proj. Manager: REE
Barr DQ Manager: JET
Lab Name: Legend
Lab Location: St. Paul

Relinquished by:	On Ice? Y N	Date	Time	Received by:	Date	Time
Kent Mut	Y	11/9/21	1500	[signature]	11/10/21	9:48
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): 0.5 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

Barr Engineering Co. Chain of Custody 2105216

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

COC Number: **№ 591034**
COC 2 of 2

REPORT TO	INVOICE TO
Company: Barr Engineering Co,	Company: Barr
Address: 325 S. Lake Ave,	Address:
Address: Duluth, MN 55802	Address:
Name: Ryan Erickson	Name:
email: rerickson@barr.com	email:
Copy to: BarrDM@barr.com	P.O. —
Project Name: Woodland phase II	Barr Project No: 23692468 300 200

Matrix Code:
GW = Groundwater
SW = Surface Water
DW = Drinking Water
PW = Pore Water
WW = Waste Water
WQ = TB, FB, EB, etc.
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Preservative Code:
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D = H_2SO_4
E = NaOH
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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	Analysis Requested: Water	Soil: BTEX 8260	Soil: DRO WI method	Soil: GRO WI method	Soil: % Solids	Preservative Code	Field Filtered Y/N
										F	A	F	A		
										N	N	N	N		
1. B-11	7.5	7.5	ft	11/09/2021	1345	S	N	4	11A-D	X	X	X	X		
2. M-1	14	14	ft	11/08/2021	—	S	N	4	12 ↓	X	X		X		
3. Field Blank	—	—	—	—	—	—	N	1	13A	X		X			
4. Trip Blank	—	—	—	—	—	—	N	1	14 ↓	X		X			
5.															
6.															
7.															
8.															
9.															
10.															

BARR USE ONLY
Sampled by: KMJB
Barr Proj. Manager: RDE
Barr DQ Manager: JET
Lab Name: Legend
Lab Location: St. Paul, MN

Relinquished by:	On Ice? Y N	Date	Time	Received by:	Date	Time
Kent Mat	(Y) N	11/9/21	1500		11/10/21	9:48
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): 0.5 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